UNIVERSITY OF ZULULAND

PERCEIVED LINGUISTIC AND COMMUNICATIVE COMPETENCE OF BI/MULTILINGUAL AUTISTIC CHILDREN IN KWAZULU-NATAL, SOUTH AFRICA

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B.A. (Hons), M.A.

Thesis submitted to the Faculty of Arts in fulfilment of the requirements for the degree of Doctor of Philosophy in English at the University of Zululand, KwaDlangezwa, South Africa

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ETHICAL DECLARATION

It is hereby declared that this study "Perceived Linguistic and Communicative Competence of Bi/Multilingual Autistic Children in KwaZulu-Natal, South Africa" which is submitted to the University of Zululand in fulfilment of the academic requirements for the award of Doctor of Philosophy in English is my original work. I also declare that the work has not been presented for the award of any degree at any other university. All the sources that were consulted in the study have been duly acknowledged both in the text and in the references.

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Olumuyiwa Adekunle Kehinde Date

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Dr BXS Ntombela Date

Main Promoter

Dr C Hermann ……

Co-promoter Date

DEDICATION

This work is dedicated to Almighty God, the giver of life, strength, and highest cognitive capability.

The work is also dedicated to all children and individuals who are affected by autism spectrum disorder, and their caregivers who in one way or the other are catering for these individuals and rendering meaningful services to them.

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ABSTRACT

Autism Spectrum Disorder (ASD) is a severe brain-related neurodevelopmental disorder compared to many other childhood disorders. ASD is a lifelong global phenomenon and it is characterised by significant impairments in social, and communication skills with some repetitive or stereotypical behaviours. This study investigated the linguistic and communicative ability of children with ASD. The study specifically focused on the nature of socio-communication traits of children with autism in KwaZulu-Natal and sought to identify ways to enhance their linguistic and communicative skills. The main research questions of the study include: (i) What are caregivers' perspectives about the prevalence of autism in KwaZulu-Natal and among different cultures? (ii) What communication methods are being employed to interact with autistic children? (iii) What is the disposition of parents, educators, speech therapists, and clinicians in KwaZulu-Natal Province towards the development and deployment of bi/multilingualism by autistic children? (iv) What are the neurocognitive and psycholinguistics bases for understanding autism, and for enhancing linguistic and communicative competence among autistic children in KwaZulu-Natal and its implications on their academic performance?

The study leaned on Theory of Mind (ToM) (including its embedded or expanded form—Explicit and spontaneous implicit ToM in ASD), Disruptive Connectivity Hypothesis (DCH), some psycholinguistic theories (Imitation, Nativism or Behaviourism Theory, Nativist or Innateness Theory, Mentalist/ Cognitive Theory/ Social-Cognitive Theory, Social-Pragmatic Theory) and some relevant neurolinguistics framework to explicate relevant concepts and the research problems interrogated by the study.

An embedded mixed method design was adopted by this study, and doing so entailed research design from both quantitative and qualitative paradigms. Data were collected through two sets of questionnaires (one for the parents, and another for the educators), as well through interviews. A face-to-face method was employed to administer the survey instrument. The survey targeted parents and educators in KwaZulu-Natal with a belief that the educators have been rendering service to children with ASD for some years and therefore have knowledge about ASD and social communication skills of these children. The interviews involved few educators, the speech and language therapists, and clinicians/ paediatricians, and the interviews were conducted in 4 research sites. This helped to dig deeper and explore the subtle difference in meaning, or opinion that the questionnaire might inadequately capture, and to also aid triangulation. The selection of sample size of the study was

obtained through purposive and convenient sampling. Combining these sampling methods were necessitated by the impact of COVID-19, which made recruitment of research participants and gaining access to a larger number of them more difficult. A total of 60 participants participated in the study (36 parents and 16 educators responded to the survey; while 8 of the educators, 4 speech and language therapists, and 4 clinicians/ paediatricians) were interviewed. The respondents who participated in the survey comprised of the parents and the educators; while the interviewees comprised of speech and language therapists, clinicians/ paediatricians, and the educators.

Overall, the study findings indicated that the majority of children with ASD in this study could be categorized as those with low language abilities, and there was absence of pragmatic, vocabulary, word use and sentence structure, grammar, writing, articulation skills, and discourse and conversational principles among them. Only a few of them displayed little skills in these aspects of language and communication. The study also revealed that there was absence, or deficit or delay in language acquisition, production and development of these children; and the majority of them were nonverbal. As in the above-mentioned areas of language and communication, it was found that the production and comprehension of expressive and receptive languages in either L1, L2 or L3 word use and sentence structure also had neurolinguistic and psycholinguistic underlying.

The study also found that the majority of the parents, educators, and speech and language therapists used words combined with demonstrations, signs, body language, gestures, and pictures as the main methods of communicating with them. Also, it was discovered that many children with ASD were brought to school very late (up to 15 years) and also failed to receive a replica of educational services including training on behavioral and social communication at home.

The study found that the majority of the parents had limited knowledge or awareness about ASD, and other caregivers or professionals like educators, speech and language therapists, and clinicians/paediatricians had little knowledge about the disorder. As shown by the study, ASD diagnosis was carried out mainly at a General Hospital, and it was found that ASD was not prevalent in one culture than the other. The study also found that virtually all participants believed that raising, training and educating these children with two or more languages would lead to confusion, and be detrimental to their cognitive ability and overall wellbeing. The study further found that an understanding that ASD has some relevant bases enshrined in neurolinguistics and psycholinguistics as well as brain functionality, may help in seeking combined or comprehensive support or services for enhancing both linguistic and communicative skills of affected children.

As revealed by the study, the strategies employed by the educators, speech, and language therapists to teach and train children with ASD were sign language (including demonstration of tasks), pictures, songs and visuals. Fewer speech and language therapists employed modern audio-visuals like iPad and laptop. Likewise, only fewer educators consistently capitalized on each child's unique strength during teaching and learning process. Routine and repetition of lessons were part of the teaching strategies that some educators employed. It was found that the majority of educators as well as speech and language therapists were not using comprehensive and unique pedagogical approaches such as all components of Structured Teaching strategies developed by TEACCH (Training and Education of Autistic and related Communication-handicapped Children), AAT (which requires visualization of everything), and ABA specifically for enhancing linguistic and communicative skills.

It is recommended that high level of awareness on ASD should be made a priority by the KwaZulu-Natal Department of Health, and KwaZulu-Natal Department of Education, mass media, and professionals in any field that relates to ASD. The above-mentioned government agencies should create avenues for having more psychologists and other specialists on neurodevelopmental disorders for easy detection and diagnosis of ASD using DSM-V criteria. Parents and caregivers should seek support after their children have been diagnosed with ASD. Having the right people, information, knowledge and action in place may help these children to have chances of increasing their linguistic and communicative competence.

The study further recommends that professionals that work closely with parents and children with ASD should render support in whatever capacity they can; and parents should stick to those professionals that are giving them adequate attention, which may positively enhance behaviour and social communication of their children with ASD. Early joint attention should be established between parents and their children with ASD for better introduction and exchange of varied verbal and nonverbal communication cues. Importantly, parents, educators, speech and language and other professionals should understand what works well for enhancing each child's language and communication. The use of augmentative and alternative communication (AAC, a form of assistive technology) is also suggested as it has proven to enhance social interaction and communication, executive function, and cognitive capability regardless of each child's ability in verbal and nonverbal communication. It is also suggested that a combined use of words, sign language, songs, demonstrations, and other nonverbal cues should be attempted in some cases where assistive technology is not available.

The study recommends further studies on understanding other frontiers that focus on ASD within the contexts of neurolinguistics, psycholinguistic and sociolinguistic knowledge of educators, and speech and language therapists towards enhancing linguistic and communicative skills of individuals with ASD in South Africa and beyond.

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LIST OF ABBREVIATIONS AND ACCRONYMS

AAT – Augmentative and Alternative Therapy

ABA – Applied Behaviour Analysis

ABAEO – Applied Behaviour Analysis Education Organisation ABAEO

ADDM – Autism and Developmental Disabilities Monitoring Network

ADI – Autism Diagnostic Interview-Revisited

ADI-R – Autism Diagnostic Interview-Revised

ADOS – Autism Diagnostic Observation Schedule

ADOS-G – Autism Diagnostic Observation Schedule-Generic

APA – American Psychiatric Association

ASD – Autism Spectrum Disorder

BPVS – British Picture Vocabulary Scale

CDC – Centers for Disease Control and Prevention

CELF – Clinical Evaluations of Language Fundamentals

CNS – Central Nervous System

CP – Communicative Competence

DCH – Disrupted Connectivity Hypothesis

DSM – Statistical Manual of Mental Disorder

EVT – Expressive Vocabulary Test

HFASD – High Functioning Autism Spectrum Disorder

IPQ – The Illness Perception Questionnaire

KZN – KwaZulu-Natal

L1 – First Language/ Mother tongue

L2 – Second Language

L3 – Third Language

LAD – Language Acquisition Device

LC – Linguistic competence

LH – Left Hemisphere

LP – Linguistic Performance

MCDI – MacArthur-Bates Communicative Development Inventory

MSEL – Mullen Scale of Early Learning

PDD – Pervasive Developmental Disorder

PEP-3 – Psychoeducational Profile-3

PPVT-III – Peabody Picture Vocabulary Test–III

PPVT – Peabody Picture Vocabulary Test

RH – Right Hemisphere

SPSS – The Statistical Package for Social Science

STS – Superior Temporal Sulcus

TD – Typically Developing

TEACCH – Training and Education of Autistic Children and Related Communication-handicapped Children

ToM – Theory of Mind

UG – Universal Grammar

UNICEF – United Nation International Children Emergency Fund

USA – United States of America

WHO – World Health Organisation

CHAPTER ONE

GENERAL INTRODUCTION

1.1 Introduction

This chapter discusses the background information on the study to capture linguistic and communicative aspect of Autism Spectrum Disorder (ASD) in KwaZulu-Natal Province of South Africa. It emphasises, in particular, the principle behind autism and its nexus with language and communicative competence of the autistic individuals. This chapter also highlights the motivation for the study, aim of the study, the problem statement of the research, the research objectives, the significance of the study, the research questions, and the delimitation of the study.

1.2. An Overview of Autism Spectrum Disorder (ASD)

ASD is a neurodevelopmental syndrome that has growing attention globally. Two or more decades ago, the prevalence of ASD was a matter of controversy as most scholars believed that ASD occurred only in Western cultures or countries with technological development (Bakare & Munir, 2011). ASD in Africa was a subject of critical debate; however, documented reports from other parts of the world have shown that in the last ten years, there has been an increase in both prevalence and knowledge of this disorder (Fombonne, 2003; Bakare & Munir, 2011).

The current situation of ASD in Africa remains convoluted as the continent is lagging behind in research and funding. Some researchers have shown that Africa has very few academic papers in refereed journals on ASD (Tomlinson & Swartz, 2003). Three years after the global report of autism by Kanner in 1943, Lotter (1978) was the first to report autism among African children he investigated the disorder in Ghana, Nigeria, Kenya, South Africa, Zimbabwe and Zambia. Another report also states that “most of the identified studies (74%) were conducted in only 2 African countries, that is, South Africa and Nigeria. Additionally, most of these studies (83%) were carried out in the last decade” (Abubakar et al., 2016, p. 1). In addition, Franz et al. (2017) conducted a comprehensive scoping review of all published research pertaining to ASD in sub-Saharan Africa to ascertain the knowledge gap, and they discovered the need to embark on wide-scale clinical, training, and research programmes aimed at elevating the living standard of individuals with ASD in this part of African continent. This further indicates the need for new and comprehensive research.

ASD, as one of the developmental disorders, is characterised by noticeable traits such as lack of or deficit in social and communication skills, restricted and repetitive habits and difficulties in behaviour. These features adversely influence quality of life of those affected as well as their families (Lord et al., 2000, Belkadi, 2006; Kjelgaard & Tager-Flusbeg, 2001 etc.) ASD's main diagnostic signals comprise restricted forms of interests, presence of repetitious behaviours, and disabilities in reciprocity and social communication (American Psychiatric Association, 2013). Although the disorder is diagnosed in childhood, it is persistent throughout adulthood. ASD, as a brain-related disorder, is extremely socially heterogeneous and affecting approximately 1.5% of the population (Christensen, 2016). Globally, research has shown that 1 in every 160 persons is estimated to live with ASD, thus contributing to 7.6 million disability life adjusted years" (WHO, 2013 in Abubakar et al, 2016, p.1). Notably, boys are three times more prone to ASD than girls according to a systematic review and meta-analysis conducted for fifty-four studies whereby out of 13,784,284 participants, 53,712 had ASD with the boys being 43,972, and girls were 9,740 (Loomes, Hull & Mandy, 2017). The authors also mentioned that this disparity might be due to gender bias in diagnosis.

From the background above, it is logical to opine that language and communication are fundamental to autism and its related study. Language employed in specific contexts serves as a vehicle for communication, social bonding and interaction, learning and teaching, among others. However, human language is complex, and this complexity is in its formation, form and function.

This research focuses on the linguistic and communicative competence of bi/multilingual autistic children that could be linked to Classic Autism; a sub-division of spectrum disorder which incorporates both language and communication difficulties with language delay and problematic communication ability (Naushin, 2013). Language and communication difficulties are interrelated because language development has the ability to influence communicative competence. Half of all the autistic population is affected by one type of language impairment or the other. This language impairment may cover the pragmatic, syntactic, lexical, phonological, morphological, and phonetic aspect of language (Belkadi, 2006), which could be investigated in first, second or third language (L1, L2 and L3 respectively) of the autistic children.

1.3 Motivation for the Study

The present situation that surrounds communication and language disorders such as autism in South Africa (just as it is in many other African countries) could not be swept under the carpet. It was also recorded that over the period of 1996-2000, there was 8.2% increase in the number of children with autism who attended developmental clinics in Gauteng (Jacklin, 2006 in van Biljon, Kritzinger & Geertsema, 2015). The accurate figure of the people with autism in KwaZulu-Natal (KZN) Province of South Africa could not be accurately ascertained. Looking at the epidemiology of ASD in South Africa, there could be annual 5000 new cases of ASD, and thus buttresses the claim of over 270 000 ASD in the country (Springer et al., 2013; van Biljon, Kritzinger & Geertsema, 2015). Based on the situation like the one established above, scientific studies are required to focus on the linguistic and communicative activities of autistic individuals, increase understanding and awareness on what autism is, the use of bi/multilingualism in raising autistic individuals, and science-based solutions that may aid amelioration and effective management of these disorders.

1.4 Statement of the Problem

This study is interested in accounting for gap analysis within the domain of language, communication, and developmental disorder known as autism, and it is designed to fill those observable gaps. Social behaviour has been mostly studied, while psycholinguistics, neurolinguistics, and autism have not been comprehensively employed to investigate linguistic and communicative competence amongst autistic children particularly in South Africa, and generally in Africa. First, KwaZulu-Natal Province in South Africa, like some other places in Sub-Sahara African countries, has a high prevalence of autistic children who are from bilingual or multilingual backgrounds but are mostly non-verbal. Therefore, this research endeavored to show the possibility to increase linguistic and communicative competence of children with autism, and reduce misinformation about the disorder in KZN based on some insights from psycholinguistic and neurolinguistic bases of language production, acquisition, and comprehension of verbal and non-verbal children with autism.

Another problem that was addressed is the belief that bi/multilingualism may worsen linguistic and/or communicative competence of autistic children. Even in the United States of America (USA), such a notion exists despite the country being a leading funder of autism

research and advocacy in the world. Such a notion therefore increases the tendency for parents, educators and clinicians to stick to one language while dealing with autistic children and thus make such children become monolingual - a case which grossly limits social interaction, communication etc. in a multilingual society like South Africa. Nevertheless, bi/multilingualism, according to reports, add more cognitive benefits to such children (Bialystok, 1999; Bialystok, Craik, Klein, & Viswanathan, 2004; Bialystok & Martin, 2004; Mechelli et al., 2004; Howard, Gobson & Katsos, 2019). Until now, there is still uncertainty about the extent to which bilingualism helps children with ASD, but it is beneficial to both cognitive and executive function (Peristeria et al., 2020).

Furthermore, in South Africa, and in KwaZulu-Natal Province in particular, there is a dearth of research on autism, thereby complicating the (un)certainty of whether bilingualism or multilingualism is beneficial to autistic individuals. While this study did not experiment to determine the above claim, the number of languages exposed to children with ASD in the research areas and its effect on their linguistic and communicative skills can be ascertained through classroom observations. As a result, caregivers of autistic children are ill-prepared to decide on the number of languages these children may be exposed to during their early years of development. This may also hamper having concrete strategies for enhancing both linguistic and communicative skills of autistic children in these research areas. In the same vein, KwaZulu-Natal Province, as well as South African national government lacks relevant and enough blueprints from empirical findings on autism. These blueprints can also aid earlier intervention and diagnosis – which could guide policy-making processes – that will create awareness in the province and in the whole country. This may therefore lead to creating more special schools, empowering/ educating the available caregivers, and supporting relevant research on autism.

1.5 Aims of the Study

The conceptual aim of this research was to ascertain the nature of socio-communication traits of children with autism in KwaZulu-Natal and to suggest ways that may enhance their linguistic and communicative skills. Furthermore, the research aimed at encouraging bi/multilingualism which is believed to be an asset rather than a deficit to many autistic children. Additionally, the study aimed at providing adequate and latest information tools and skills necessary for enhancing knowledge of language and communication-related services

rendered by parents, educators, clinicians/pediatricians and other caregivers of children with autism, and thereby improve interventions, diagnosis, social-interaction, and communicative competence of bi/ multilingual autistic children in general despite their varied phenotypes.

1.6 Research Objectives

In line with the above aims, the study set out to achieve the following objectives:

1. Investigate caregivers' perspectives about the prevalence of autism in KwaZulu-Natal and possible prevalence among different cultures.

2. Examine method of autism diagnosed, and how satisfied are parents with the support or interventions received, and what communication methods are being employed to interact with autistic children

3. Examine the disposition of parents, educators and clinicians towards the development and deployment of bi/multilingualism by autistic children.

4. Investigate neurocognitive and psycholinguistic bases of bi/multilingual autistic children in KwaZulu-Natal.

5. Examine the implications that neurocognitive and psycholinguistic bases of autism may have on the linguistic and communicative competence of bi/multilingual autistic children and their academic performances.

6. Present understandable neurocognitive and psycholinguistic model that may increase caregivers' knowledge of ASD in relation to linguistics and communication of bi/multilingual autistic children in KwaZulu-Natal and beyond.

1.7 Research Questions

This study sought to answer the following questions.

1. What are caregivers' perspectives about the prevalence of autism in KwaZulu-Natal and among different cultures?

2. How autism is being diagnosed, and how satisfied are parents in KwaZulu-Natal Province with the support or intervention received, and what communication methods are being employed to interact with autistic children?

3. What is the disposition of parents, educators, speech therapists, and clinicians in KwaZulu-Natal Province towards the development and deployment of bi/multilingualism by autistic children?

4. What are the neurocognitive and psycholinguistics bases for understanding autism, and for enhancing linguistic and communicative competence among autistic children in KwaZulu-Natal?

5. What are the implications of neurocognitive and psycholinguistic bases on the linguistic and communicative competence of bi/multilingual autistic children and their academic performance?

6. How can a neurocognitive and psycholinguistic model increase caregivers' understanding of ASD in relation to linguistics and communication of bi/multilingual autistic children in KwaZulu-Natal Province and beyond?

1.8 Significance of the Study

The only known studies about ASD in KwaZulu-Natal were conducted by Chambers et al. (2017) and Pahl (2017). The first study centred on the appropriate cultural tools for the early detection of autistic symptoms in isiZulu–speaking youngsters. The study also confirmed some challenges that include dearth of knowledge about autism, absence of access to healthcare due to poverty, and in another instance, lack of awareness on the significance of early social communication landmarks, and social shame attached to giving birth and raising a child with a disorder (Chambers et al., 2017). The second study reported the views and knowledge of parents of children with ASD regarding a range of treatments, and speech language therapy was known mostly by the parents (Pahl et al., 2017).

The importance of the present study cannot be overstated. As multidisciplinary research, the benefits accruable from this research cut across linguistics, communication, psychology, childhood education, and medical diagnoses among others. This study is aimed at building on the previous research expanding by using the psycholinguistic, neurolinguistic and sociolinguistic imports to make relevant enquiries into autism disorder, its diagnoses, intervention and management, and to investigate the nature of language disruption resulting from unusual social, cognitive or perceptual abilities. In addition, the study has potential to aid understanding and building theoretical models of integral language processing that

precisely specify the role of underlying skills to overall performance. Similarly, the study unravels the basis and nature of language development (acquisition, production, and comprehension) of children with autism by presenting the theoretical underpinnings of linguistic processing as well as understanding the complexity of interrelationships among the psychological, biological, neurocognitive and social impulses that account for abnormal language and communication.

Furthermore, the research has prospects of increasing level of awareness and knowledge of caregivers such as parents, educators, speech and language therapists, and clinicians specifically about enhancement of language and communication of autistic children, and the discovery, diagnosis, intervention and management of ASD in general. By extension, the knowledge is expected to help in raising, teaching, and managing children with autism at home, school, and society respectively. The study further has another import that explains notions against exposing or raising children with ASD to bi/multilingualism in the light of cognitive essence of bilingual or multilingual usage at home and school. Another significance of the study lies in highlighting some relevant perspectives about policy-making on ASD, and the interrelationship/communication model that all stakeholders may need to ensure needful intervention and actions on children with autism in KwaZulu-Natal Province in South Africa and beyond.

1.9 Scope and Limitation of the Study

The study attempted a description of linguistic and communicative competence of bi/ multilingual children with children with autism in KwaZulu-Natal, South Africa. The scope of this study focused on linguistic and communicative competence of bi/multilingual autistic children in KwaZulu-Natal. The study was limited to the deficit or delayed linguistic and communicative trait of ASD bearing in mind the speech production, and speech comprehension at grammar, discourse and pragmatics level of their L1, L2 or L3 (or in all, depending on language ability of children with ASD). In this context, L1, L2 or L3 are mainly viewed from caregivers' perspectives, especially the parents, educators and speech and language therapists who can influence raising and training autistic children in more than one language. In that sense, these respondents' use of two or more languages for communicating and interacting with these children with ASD was taken as potential means of

having bi/multilingual children with ASD, and does not necessarily mean that those children with ASD especially those who were verbal were using two or more languages at all.

The study also concentrated on children with Classic or Kanner's Autism with or without mental retardation symptoms like low-level of intelligence quotient (IQ), but not concerned with children with Asperger Syndrome which does not manifest significant delays in cognition, language, self-help skills, and probably adaptive behaviour commonly found in autism. While the study was not interested in prescribing clinical remedy for symptoms and manifestation associated with autism, the study was limited to how this disorder affects socio-communication and linguistic and communicative competence of the affected children. The research was limited to KwaZulu-Natal due to funding and time constraints. The province is the second most populated province in South Africa after Gauteng. Therefore, there was availability of a reasonable number of research respondents like bi/multilingual caregivers (that is, parents, educators, speech therapists, and clinicians) with different cultural backgrounds as well as few caregiving centres, speech therapists, educators, and clinicians who engage in diagnosis, intervention and management of autism. The study could not provide all answers to all issues that can be raised in respect of language and communication of individuals with ASD like the ascertaining the activation of certain brain regions. The study's focus was therefore on some gaps identified from observation and in the literature on linguistic and communicative skills of children with ASD in South Africa.

1.10 Operational Definition of Terms

i. *Autism Spectrum Disorder*: Based on DSM-V, this disorder is characterized by difficulty in communication and interaction with other people. This disorder means that its symptoms and features are noticeable in varied combinations which may range from mild to severe (Turkington & Anan, 2007).

ii. *Bi/multilingualism*: these terms are commonly discussed in psycholinguistics and sociolinguistics, and they are sometimes used interchangeably to denote the linguistic situation whereby two or more languages are mastered and used but on a varied degree. In this study, the term, bi/multilingual autistic children, denotes all children with ASD (verbal or non-verbal) who were raised by bilingual or multilingual parents, and who are also receiving service from educators, speech and language therapists, and clinicians or pediatricians. The

term as used in this study does not signifies that these children are minimally or proficiently using or learning two or more languages, and that made the word *perceived* to be added to the title of this study in line with suggestions received from two external examiners.

iii. *Language acquisition and production:* this is employed to denote processes human beings follow to acquire, develop, and use language that usually starts from their infancy. This stage also involves the capacity (represented in the brain) to produce and use words and sentences for communication. Language acquisition necessitates representation, rules, and structure, and a capacity to reasonably employ language. It also involves acquiring a set of tools in semantics, morphology, phonology, syntax, and vocabulary (Lightfoot, 2010).

iv. *Language production:* language perception predates language production which is the process in which speech is generated from thoughts. The process of language production involves words selection, arrangement of relevant grammatical forms, and followed by articulation of sounds which are made by the motor system through the vocal anatomy. Speech production could be differentiated from language production because language can also be produced through signs and body movement (Fry, 1977).

v. *Language comprehension:* this term is employed to explain the comprehension process involving receptive language impulse. The response may be articulated, written or be in body movement or sign. The brain-based processes involved in language production and comprehension have been used to explain that the traditional dichotomy between the two are unsubstantiated. Some studies reveal that the processes needful for comprehending an utterance or a written sentence like ambiguity clarification may differ from the processes needed for describing a scene. This further means that language production and language comprehension are closely linked, and this link helps people to be aware of and think about themselves and one another (Pickering & Garrod, 2013).

vi. *Cerebral Cortex:* this is a part of human brain which comprises different aspects such as lobes, and it is responsible for information processing.

vii. Linguistics: this term is used to denote the humanistic and scientific study of language.

viii. Language delay: this suggests when individuals especially children have a lag or problem in developing their language and communication skills. This may also be a case whereby those skills are slow to develop or totally absent due to certain causes like disease, and brain injury. Among children with autism, language delay is noticeable, and it may imply abnormal language development.

ix. Language deficits or disabilities: these type of presence deficits or disabilities mean a lack of language sufficiency which may be receptive, expressive, written, and symbolic.

x. Communication: this is pertained to the art and act of exchanging verbal and non-verbal cues on a variety of subject-matter usually from the sender to the receiver and vice-versa.

xi. Linguistic competence: this type of competence could be described as knowledge one possesses about language, and it can be tacit, or implicit. What this suggests is that in most cases, people have no conscious access to the rules and principles governing how words, sounds and sentences are combined; however, when those rules and principles are not followed, they are abreast of it (Fernandez & Cairns, 2011).

xii. Communicative competence: in this context, it means an ability to express oneself and respond to others clearly and sufficiently and appropriately as expected in a particular situation. For children with ASD, communicative competence is not expected to match their age-matched typically developing children – but it is believed their own competence too can be enhanced. The term was coined and first used by the linguist, Dell Hymes in 1972 to refer to the tacit knowledge of a language as well as the capability to employ the knowledge efficiently (Nordquist, 2018).

1.11 Research Design for the Study

The mixed-methods research involves quantitative and qualitative methods, and both were adopted for this study. Cresswell and Plano Clark (2011) asserted that quantitative and qualitative methods are essential data collection strategies that can be sequentially or concurrently employed to engender empirical evidence relevant for providing answers to any particular research question. The rationale behind the choice of this method was that the method can accommodate and account for what a single-method design cannot do in terms of

understanding and providing answers to the research problem. There are five major types of mixed methods according to the Public Health Centre of Columbia University (2018): multi-phase or iterative mixed method design, exploratory mixed method design, convergent mixed method design, explanatory mixed method design, and embedded mixed method design.

In a multi-phase or iterative design, a series of qualitative and quantitative studies (three or more) are incorporated, though this may be either multiple sequential or concurrent designs. Unlike typical concurrent or sequential studies, multi-phase design usually has a longer design arc. In exploratory mixed method design, which is a type of sequential mixed methods design, the use of traditional qualitative methods is employed to inform or arrive at a subsequent quantitative study. Notably, employing this method means that qualitative data are first collected with the aim of generating insights suitable for informing design as well as the content of the quantitative survey. Based on this approach whereby qualitative method is firstly used followed by quantitative technique, the exploratory mixed method is thereby referred to as Qual-Quant design. Explanatory mixed-method design is another form of sequential mixed-method design whereby qualitative method aims at explaining quantitative results. The process is like this: before collection and analysis of qualitative data, quantitative data are gathered and analysed firstly; whereby convergent design is a form of concurrent mixed-method. In addition, embedded or nested design like concurrent mixed-method design utilises a small amount of either quantitative data or qualitative data that is added to a larger qualitative or quantitative study.

For this study, an embedded or nested design was adopted to ensure that both qualitative and quantitative data were gathered. The quantitative data which were much bigger were supplemented with the qualitative data whereby some respondents were interviewed about the phenomenon under study. The qualitative data were also extended to classroom observations whereby the teaching strategies adopted by educators of various groups and levels of children with ASD were observed. Meanwhile, different sets of structured questionnaires were designed for educators and parents (though with some adaptation and permission from the owners). The questionnaire designed for the parents were translated into isiZulu for easy comprehension. Both sets of questionnaires were aimed at eliciting quantitative data from respondents while the qualitative aspect of the study involved interviews with key informants like educators, clinicians and speech therapists. The presence of these research respondents in this study made the whole data gathered to be robust, and it

also helped in finding deeper answers to the research questions. Essentially, the adoption of multiple approaches for data gathering was to enlarge the number of research respondents, and also to enrich the information they supplied on the subject matter of this study.

1.13 Dissemination of the Research Findings

The findings of this research were disseminated to relevant and appriopriate users via available channels such as peer-reviewed journal articles and conference papers. Also, the findings were disseminated to parents of children with autism, their educators, their clinicians, and the Department of Basic Education.

As such, few findings of this study have already been presented at local and international conferences. In addition, some research papers have been harvested from the study and have been published. Some conferences and papers already made out of this research are detailed below.

Peer-reviewed Conferences

1. Perspectives and Challenges of Parents and Educators of Children with Autism in the Fourth Industrial Revolution (4th Annual Teaching and Learning Conference, uMfolozi Casino, Empangeni, KwaZulu-Natal, South Africa, 9 - 11 October, 2019).

2. Gender Issues in Autism Management and the Roles of Researchers in their Community and Beyond (Higher Education and Community Engagement in 2050, Coastlands Hotel on the Ridge, Durban, KwaZulu-Natal, South Africa, 29-30th August, 2019).

3. The Psycholinguistic and Neurolinguistic Nature of Communications and Education in Early Development of Bi/multilingual Autistic Children (Hosted by the Durban University of Technology Elangeni – Maharani Hotel Durban, KwaZulu-Natal, South Africa, 23-25 October, 2019).

Peer-reviewed Published Papers

1. The Psycholinguistic and Neurolinguistic Nature of Communications and Education in Early Development of Bi/multilingual Autistic Children (International Journal of Innovation, Creativity and Change, 2021).

2. Public-Private Sector Partnerships in Healthcare System Delivery for Developmental Disorders in Sub-Sahara Africa (International Journal of Innovation, Creativity and Change, 2021).

1.14 Structure of the Thesis

The chapters of this thesis are organised as follows:

Chapter One: General Introduction

This introductory part of the study includes a general foundation of this research. This chapter focuses on the general introduction, the background of the study, the problem statement, the aims and objectives of the study, the significance of the study, contribution to knowledge, the scope of the study, the limitations of the study, and the summary of the chapter.

Chapter Two: Literature Review

This chapter reviews and synthesises relevant literature on the topic. Reviewed literature is sourced from journal articles, books, relevant websites etc. for getting adequate information on various concepts related to this topic.

Chapter Three: Theoretical Framework

The chapter is concerned with the theoretical framework relating to the study, which includes Theory of Mind (ToM) and its extended form known as Implicit and Explicit Theory of Mind, as well as some psycholinguistic theories, and neurolinguistics conceptual framework.

Chapter Four: Research Methodology

This chapter concentrates on research methodology, or methodological design of this study. The chapter explains sources of data, sampling procedures, data collection, and data analysis.

Chapter Five: Data Analysis, Presentation of Quantitative Data

This chapter presents the quantitative data collected from the questionnaire administered to both parents of children with ASD, as well as their educators.

Chapter Six: Data Analysis, Presentation of Qualitative Data

The chapter presents qualitative data gathered through interviews conducted with educators of children with ASD as well as some speech therapists and clinicians.

Chapter Seven: Discussion of Major Findings

This chapter discusses the major findings in relation to what has been found in some previous studies.

Chapter Eight: Conclusion and Recommendations

This chapter summarises and concludes the whole study. The chapter also presents some recommendations and makes suggestions for further research.

1.15 Summary

This chapter as the preliminary aspect of the study presented an overview of ASD and discussed the problem statement, background to the study, aims and objectives, scope and limitations to the study. The aim of this chapter was to introduce the study. The next chapter briefly explains the multidisciplinary bases of the research and also conducts an in-depth literature review with a focus on relevant topics that cut across the field of psycholinguistics, neurolinguistics, cognitive linguistics, sociolinguistics and ASD in general.

CHAPTER TWO

REVIEW OF RELEVANT LITERATURE

2.1 Introduction

This section constitutes a broad review of relevant literature on conceptual issues surrounding the research topic. The chapter also seeks to contribute to the body of knowledge on ASD, bi/multilingualism, language acquisition, language production, language development, and in relation to childhood development, neurolinguistics, and childhood education and educational psychology. Different and relevant authorities and their contributions in those fields are synthesised to reflect and explain topical themes of this study.

The above fields are set to help in describing concepts which determine the multidisciplinary nature of this research project. Before the relevant aspects of those fields are fully explored, some of the subjects in this multidisciplinary study are highlighted below.

i. **Neurology:** This is an aspect of medicine that studies the components and fundamental bases of nervous system and its associated disorders with their treatment. The nervous system is an interconnected and complex system that controls and organises body activities. The nervous system has major divisions comprising the brain and spinal cord.
ii. **Neurolinguistics:** This is an aspect of linguistics that is concerned with the interrelationship between language and the structure and functioning of the brain. It also describes how language is represented and processed in the brain, which aspect of the brain processes language, and how human languages are what they are.
iii. **Neurocognition:** This term could be described as the functioning of any aspect of the brain. Essentially, it is a performance on various measures of cognitive abilities, such as memory, attention, and executive functions.
iv. **Psycholinguistics**: This is a branch of linguistics or cognitive science which deals with three primary components of human languages and their interrelatedness. These components are: language acquisition, language production and language comprehension in human beings. Psycholinguistics offers explanations on how humans produce and recognise speech, perceive words, letters, and sentences, learn and remember information from texts, among others.

v. **Sociolinguistics**: This is a branch of both linguistics and sociology in which languages in a particular community or society is studied in terms of social status and overall function in communication.

vi. **Autism:** This is a neurobiological and neurodevelopment disorder that manifests in childhood, and with basic features which include stereotypical behaviours, lack of social skills, delay/ deficit/ or absence of language and communication.

vii. **Educational Psychology:** This is a branch of education that describes learning in terms of cognitive systems of individual learner, which in turn influences their academic performance.

viii. **Childhood Education:** This is a category of education theory also known as early childhood education. This type of education theory seeks to popularise a systematic enlightenment (aimed at imparting knowledge) of children from birth to 8 years. In countries where education is less developed, this age could be extended to accommodate those children who may start education late.

2.2 Autism from Global Perspective to Africa

The world has witnessed various but (sometimes) diverse experiences of autism. These experiences in different societies range from level of occurrence, spate of awareness, systems of diagnosis, treatment and management. In South Africa, the known and widely reported experiences include both social and psychological stress associated with ASD (Mazibuko, Shilubane & Mangaye, 2020); isolation from the public and stigma due to strange behaviours of autistic individuals (DePape & Lindsay, 2015); poor understanding and lack of awareness about the disorder especially by those in remote areas (Mthimunye, 2014). Moreover, people who take care of autistic individuals have been observed to experience financial constraints and are unable to seek early diagnosis and adequate interventions in South Africa (Mazibuko, Shilubane & Mangaye, 2020). This section also focuses on other related themes.

Autism Spectrum Disorder (ASD) previously called pervasive developmental disorder (PDD) was first identified by the American psychiatrist, Leo Kanner, in 1943 (Comer, 1992), and it was noticeable by untypical communication, social interaction, interests or body movements. In 1980, autism was first found in the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorder (DSM-III, APA 1980), and since then it remains in

most recent or subsequent editions (DSM-5, APA 2013) (Gernsbacher, Morson & Grace, 2016).

Autism, a brain-based developmental disorder is commonly noticeable in children as young as 2 years. It is not homogenous as many children with autism show different phenotypes. This "phenotypic heterogeneity of ASD" according to reports "contributes to conflicting research findings that paint a confusing picture in the literature. For example, depending upon the characteristics of a particular sample, groups of children with ASD can look as if they have face processing impairments or not" (Weigelt, Koldewyn & Kanwisher, 2012, p. 23), perceptual processing biases or not (D'Souza, Booth, Connolly, Happé & Karmiloff-Smith, 2015), and persistent social language differences or otherwise (Fein et al., 2013, in Christensen, 2016).

The universality of ASD in the last three decades or more received much questions and debates principally on possibility that technologically-advanced, and western countries have more percentage of autistic people in the world compared to other countries (Bakare & Munir, 2015). That notion may be inaccurately reported due to differences in periods of research and social awareness. While Richmond (2011) gives the world population of the autistic people to be approximately 1%, Christensen (2016) says 1.6% of the world population is autistic, and Baird et al. (2006), Fombonne (2009), and Robins (2008) put the global prevalent statistics of ASD at 1% of total new births.

In the United States of America, one report showed that 110 people per 10,000 population are autistic, while another study reported 113 people per 10,000 population, thereby making both reports to be closely similar (Kogan et al., 2009, Centers for Disease Control and Prevention, 2012). According to Centers for Disease Control and Prevention-CDC (2012); the prevalence rate shows that males are 5 times autistic than females. ASD could be found among teenagers and adults as well. While a report by Baird et al. (2006) indicated 116 people per 10,000 population; the study conducted by Kim et al. (2011) established that a community in South Korea has a prevalence rate of 2.64%. Contrary to the rate given by the Centers of Disease Control, Parner et al. (2011) explained that the rate of ASD individuals in Denmark was 68.5

people per 10,000 population, while Western Australia was said to have 51 individuals with autism per 10,000 population (Bozalek, 2013).

Similarly, it has been suggested that in order to capture the real prevalence rate, evaluation of ASD should be lowered to 36 months while the service from the community-based support should be started by 48 months of age in accordance with 2020 goal of Healthy People (Christensen, 2016). Predicated on the above, for the autistic kids of 8 years, the overall estimated prevalence rate was 14.6 per 1,000 according to the Autism and Developmental Disabilities Monitoring Network (ADDM) from 11 Sites in 2012. Recently, CDC's Autism and Developmental Disabilities Monitoring (ADDM) Network 2016 put the prevalence rate at 1:54 from 11 sites (and this rate remains unchanged at the time of preparing this report) (Maenner, Shaw, Baio et al., 2020). These sites examined the estimated rates of ASD using education and health records. The sites therefore suggest the duties of special education programme in offering wide-scale services as well as evaluations to children suffering from developmental disabilities. In what is closely related, Hispanic children in particular showed inequality of prevalence in terms of ethnicity or race, and disparities in age indicated that treatment and services might be lacking or delayed for some children even with the onset of broad assessment and involvement of a past ASD diagnosis or categorisation (Christensen, et al., 2016).

More research on ASD is being conducted around the world, in the USA, Europe, and Western Pacific (Elsabbagh et al., 2012) but that is not the case in Africa (Bakare & Munir, 2011). Africa is lagging behind in conducting research on ASD despite the global attention received by this disorder. According to a review of literature cited in PubMed in relation to various aspects of ASD (epidemiology, diagnosis, aetiology and knowledge about ASD) over the last decade, January 2000 – December 2009; a total of twelve papers were published on ASD among Africans (Seif Eldin et al., 2008; Barnevick-Olsson, Gillberg & Fernell. 2008; Belkadj, Mrad & Halayem, 2006; Bakare et al, 2008, 2009a, 2009b etc.) Each paper came from Tunisia and Tanzania, 4 came from Nigeria, and 3 from Egypt (Bakare & Munir, 2011).

In the same vein, Tomlinson and Swartz (2003) observed 764 ASD related journal articles, and found that 4% originated outside the USA or Europe. The authors also reported that in the Web of Science, a systematic review pertaining to autism and Africa between year 2002 to year 2012 indicated that only 33 papers focused on Africa or were from Africa among the 18,000 peer-reviewed papers on autism. The above indicates that actual statistics of autism in the world may remain inaccurate in as much as research conducted about prevalence autism in Africa continue to be meagre.

In South Africa, ASD prevalence in children is uncertain (Bateman 2013; Springer et al., 2013), and only few pieces of literature were found to have discussed the disorder. However, little was recorded about the nature of the disorder among the rural or semi-urban dwellers and those from "low socioeconomic status (SES) groups" (Bozalek, 2013, p.10). It is therefore uncertain to link the prevalence of ASD to one's financial status. However, there exists confusion in recording an accurate prevalence rate of ASD. For instance, while Garcia (2014) estimated that the point prevalence of ASD among children diagnosed in the US was 1:68; having 1 autistic person in 160 persons was also reported by Abubakar et al. (2016). In the course of reviewing relevant literature for this study, it was observed that the 1% of the population is commonly reported as the prevalence rate (see Baird et al., 2006; Fombonne, 2009; Robins, 2008).

Using Garcia's estimated figure, some scholars believe that there could be 5000 new cases of ASD in South Africa annually as at 2013, to buttress the claim of over 270,000 ASD cases in the country (Springer et al, 2013; van Biljon et al., 2015). Similarly, over the period of 1996 - 2000, there was 8.2% increase in the number of autistic children who attended developmental clinic in Gauteng (Jacklin, 2006 in van Biljon et al., 2015). Springer (2013) also sounds unclear on whether the increase in prevalence of ASD in South Africa is related to the level of awareness among the parents and the professionals or due to more complex diagnostic measures put in place since year 2000. There is no recent data to back up the actual prevalence rate in South Africa. Nevertheless, with 1.1 million annual births (UNICEF, 2015), the country may be having close to 2% of autistic individuals per annual births. That calls for a solid framework that can help these children overcome ASD burdens including communication and linguistic difficulties they are prone to. It is noteworthy that the number

of autistic children in KwaZulu-Natal region still needs to be ascertained just as the case in Africa and the rest of the world. However, the universality of autism phenotypic traits, screening and diagnosis etc. has gone beyond debate or questioning stage (World Health Organisation-WHO, 2013).

Importantly, reports on the prevalence rates between children with autism who are born by Africans and non-Africans reveal the possibility of having higher rate of autism from African descent than from the European. For instance, Gilberg et al. (1995) reported a 15% ASD among the children born by Ugandans living in Sweden, which by calculation is 200 times greater than those children who are born by Swedish Parents. Grant and Soles (2009) and Bakare et al. (2011b) also explained that the extreme occurrence of ASD within African immigrants overseas remains unclear but somehow linked to hypothesis on Vitamin D aetiology and other reasons.

It should be established here that no research has linked the ASD aetiology to poverty, witchcraft, and illiteracy, among others, and some underlying factors responsible for certain traits in ASD as a disorder are yet to be made clear. In what seems to be a general conclusion on the prevalence rate, Baird et al. (2006), Fombonne, (2009) and Robins (2008) reported that the prevalence of autism is more or less 1% of all new births recorded globally. These statistics may however be held as applicable to African-born children as many children were born at home or other place different from hospital or clinic where their record could be taken. Aside from the above, many factors could be linked to a huge or minor disparity noticed in the estimates of prevalence rates of autism. Such factors include the different diagnostic tools employed by different professionals, and differences in the scope of definition or description of autism in each study conducted, as some are broader in scope than others (Bozalek, 2013).

2.3 Contributions of Cultures to Rate of Autism

One of the questions to be cleared about ASD is whether its rate of occurrence differs among cultures or not. Culture here "consists of whatever it is one has to know or believe in order to operate in a manner acceptable to its members, and to do so in any role that they accept for

any one of themselves" (Goodenough, 1957, p. 167), and therefore not extended to capture appreciation of literary arts, music, and arts, among others. In the light of the above, culture here could be further described as individual's particular social knowledge for social functioning (Wardhaugh, 2006). This means that culture has little or nothing to do with ASD when talking about its occurrence, but it could be largely responsible for high rate of undiagnosed and unmanaged ASD. Several culture-related factors could make autistic children remain undiagnosed and unmanaged until they turn adults, thus making it rare to have high-functioning autistic individuals. The factors include mythical beliefs, negative cultural practices and beliefs such as linking ASD to supernatural causes (Bakare et al., 2009b). Another crucial point about culture and autism is language-related. Professionals have been advised to often consider the cultural background of the family before suggesting the number of languages an autistic child should be exposed to (Li, Oi, Gondo & Matsui, 2017).

Furthermore, based on the knowledge on this disorder that the American and European society's cultures have, they are standing as two leading continents with broad awareness and research on ASD, and thereby making their societies to be well-informed, and acting right on the diagnoses, treatment and management of ASD compared to the African continent. Therefore, if culture truly involves the technicality a person must learn and have while living in order to sail through daily task (Wardhaugh, 2006); the task of identifying/ non-identifying, understanding/ misunderstanding, and acting/ refraining from ASD may also be linked to society's culture of the African continent.

Importantly, gender and culture have also been used to explain the differences across cultures on development of the Theory of Mind (ToM) especially in developing false beliefs that may take up to two years in different countries (Halmiton, Hoogenout & Malcolm-Smith, 2016; Liu et al., 2008; Peterson, Wellinton & Liu, 2005). Also, the debate about the ratio of prevalence of ASD in males to females persists (Kogan, et al., 2009), but studies are silent as to whether the prevalence ratio is caused by any cultural practice of a particular society or not. In another view, the use of language (non-literal) is believed to be varied across cultures, which thereby suggests that before evaluating (non-literal) language comprehension in autistic individuals, the use of tasks that are found acceptable in that society must be considered (Halmiton, Hoogenout & Malcolm-Smith, 2016). Furthermore, culture and ASD could also be discussed in the light of (in)appropriate usage of contexts by some autistics, and

not about culture's contribution to the prevalence rate, and an instance is the context when and to who children should make jokes as this is seen as disrespectful in some cultures.

2.4 The Current Screening and Diagnosis Methods for Autism

Autism, like some disorders and their nature, is usually studied, treated and managed with different methods. Autism as a (neuro)developmental disorder has unique diagnoses and intervention methods which if done otherwise may not yield best results. As language and/or communication dysfunction remains an essential feature of ASD, the current methods employed for diagnoses are discussed based on the available facts from literature.

There are standard procedures (though not universal) for diagnosis of ASD but the initial diagnoses often look like a traumatic experience for the caregivers (especially the parents) who usually have mixed reactions of shock, fear, guilt, and grief which are combined with precariousness (Lutz et al., 2012; Shepherd, Csako, Landon, Goedeke & Ty, 2017). Despite such feelings, caregivers hardly get restrained in seeking help as they mostly care for the development of their children (Bozalek, 2013). As reported by Bokazi (2013), due to lack of biological marker, such situation has been observed also in South Africa. This buttresses the observation that the majority of diagnoses conducted in KwaZulu-Natal, South Africa, are also conducted in specialised developmental clinics or hospitals, which also require the services of professionals who at that point must conduct an interview with the caregivers/ parents to carry out comprehensive assessment and careful observation for the affected children. Furthermore, after diagnosis, parents, especially, are also reported to be in the forefront of decision-making for most intervention of ASD (Valentine, 2010), but this may not be the case in South Africa as many do not get interventions. When such interventions happen, the parents "typically progress through stages of mourning, adaptation and adjustment, while at the same time needing to focus on the interventions that their child will need to engage" (Shepherd, Csako, Landon, Goedeke & Ty, 2017, p. 988; see also Barak-Levy & AtzabaPoria, 2013).

The nature and status of diagnosis, screening and intervention differ from one society or country to another, and the well-referred Diagnostic and Statistical Manual of Mental Disorders has changed tremendously from one version to another ranging from DSM-IV; DSM-IV-TR; to DSM-5 (American Psychiatric Association-APA, 2000 & 2013). The earlier

versions of this manual were criticised principally on the criteria that must be present before diagnosis was performed, and that the symptoms have to be present as early as before age 3 (Lord & Bishop, 2010). The symptoms are (1) impairment or difficulty in social interaction, (2) impairment or difficulty in communication, and (3) stereotypical and repetitive behaviours with bounded interest and activities. However, in the new version of DSM-5, the three core areas for diagnosis have been abridged to two with communication and social interaction combined to become a social-communication field, while stereotyped or repetitive behaviours, confined/restricted activities, and interests formed the retained second domain. Employing DSM-5 for the diagnosis of ASD presupposes that the affected child has difficulty or deficit in the aforementioned areas of social-communication with specificity in non-verbal communication, reciprocating emotional or social interaction, and creating, developing, and maintaining relationship (American Psychiatric Association-APA, 2013).

In addition, the suspected autistic children should also display two (or at least) all of the following signs: repetitious use or playing with objects, movement, and speech; weirdly intense, fixated interests; exuberant attachment to patterns of behaviour and routines, and opposing a change of such routines; as well as grave hypo- or- hyper reactivity to sensory stimuli (Bakare & Munir, 2010; Bokazi, 2013). All of the above symptoms are expected to be present during the early development period of such children, and must be known to be impeding their positive functioning day by day; but that may seem difficult at tender age as many tasks that require greater demands often come as one grows older. What makes DSM-5 unique from previous versions (for example DSM-IV) includes that DSM-IV requires that ASD specific behaviour or difficulty/ deficit must emerge before age 3 for diagnoses to take place; but DSM-5 allows earlier diagnosis for individuals whose behavioural deficit is even undetected till later age.

Other than the diagnostic criteria, further changes that have been made to DSM were reported to include autism cases that cut across other traits of this disorder involving varying degrees (Christ, Kanne & Reiersen, 2010; Pandey et al., 2008; Bokazi, 2013). Recently, based on the above reason, DSM has abridged the four previous diagnoses (that is Asperger's syndrome (AS), autistic disorder, pervasive developmental disorder not otherwise specified (PDD-NOS), and childhood disintegrative disorder) to autism spectrum disorder (ASD), a single diagnostic category. In contrast to the above, some criticisms have been levelled against the revision that gave birth to DSM-5 (Lord & Bishop, 2010). It was observed based on empirical

data that changes effected in DSM-5 were like decreasing the symptom domains, and referring to variation of individual not on the bases of severity of their spectrum but alongside individual categories (Huerta, Bishop, Duncan, Hus & Lord, 2012; Lord & Bishop, 2010).

Specifically, some decades ago have witnessed efforts to define and delimitate autistic disorder symptoms in relation to other types of ASD and in relation to other developmental disorders (Matson, Nebel-Schwalm & Matson, 2007). It could be that the model of multi-category of DSM-IV-TR was conceived to comprehend the deficits subsumed under various subtypes (Lord & Bishop, 2010). That was done with optimism that families and therapists will have clearer comprehension of autistic disorder in terms of individuals' special aspects thus leading to offering them special attention and need (Shattuck & Grosse, 2007; Bokazi, 2013).

Additionally, the non-feasibility of employing this diagnosis for disorders considered bounded, and it was observed that the use of subtypes was undependable just as many aspects of the DSM-IV-TR were open to doubts and debates. Corroborating the above assertion, Wing, Gould and Gillberg (2011) explicated that many individuals with ASD are unfit for being considered under one type in a practical sense, and those who considered fit for one type may be later found to be under another diagnostic category. The researchers further maintained that DSM-IV-TR has an overgeneralised diagnostic category which offers practitioners narrow guidance. In another criticism against DSM-IV-TR, Dickerson Mayes, Calhoun, and Crites (2001) argued that the criteria of AS in DSM-IV-TR were not practicable and unmet in many occasions. In their study, all participants with history of being diagnosed for AS failed to meet the criteria stated in DSM-IV-TR. These researchers thereby asserted that clinicians tend to turn-off criteria mentioned in the DSM-IV-TR and go with popular opinion and literature while they wanted to diagnose individuals with AS.

The above viewpoint implies that the DSM-5 (2013) was revised to give room for an improved diagnosis and eliminating what is considered artificial criteria (Bokazi, 2013). In another view, DSM-5 in comparison with DSM-IV-TR has more sensitivity and specificity but with less positive results in other areas (Huerta et al., 2012). Based on the new changes recorded in the DSM-5 diagnostic criteria, only few studies are available when comparing the validity of these criteria found in both DSM-5 and DSM-IV-TR. Huerta et al. (2012), for instance, opined in their study of 4453 individuals (using reports from parents) that there is a

positive alignment between DSM-IV-TR and DSM-5. According to their report, criteria in DSM-5 has been found to be used for 91% of individuals diagnosed with ASD (Bokazi, 2013, p.13). For the same situation, 61% was recorded by McPartland, Reichow and Volkmar (2012) which was contrary to 91% above.

Meanwhile, reviewing literature on this issue needs to be meticulously handled because such changes may motivate the result of comparing the screening tools as well as other studies conducted. As at this moment, it has been observed that the DSM-5 may not tremendously affect the number of individuals to be diagnosed or screened, or affecting the screening and diagnosis procedures (see Bokazi, 2013) but will broaden the diagnoses results, such as helping in categorising autistic individuals to level of severity (mild, severe, and very severe). Currently, Autism Diagnostic Interview-Revised (ADI-R) (Lord, Rutter & Le Couteur, 1994) and the Autism Diagnostic Observation Schedule (ADOS) (Lord et al., 2000) are two valid instruments for autism diagnosis. The two instruments involve interview and observation which help in care for absence of ASD biological markers, and considered reliable by many (Berument, Rutter, Lord, Pickles & Bailey, 1999; Lee, David, Rusyniak, Landa & Newschaffer, 2007; Witwer & Lecavalier, 2007).

2.4.1 The Intervention Processes and Methods for Autism

The intervention methods employed for autism vary from one society to another, and KwaZulu-Natal may not be exempted. In relation to interventions for ASD, parents are seen at the centre of decision-making and its burden (Valentine, 2010). Based on empirical positive reports of many years, that earlier interventions largely ensure decrease in severity of ASD symptoms, parents are usually under pressure to engage in these interventions (Warren et al., 2011). Apart from that, many challenges are faced by these parents in a bid to applying interventions. These include availability of too many interventions (Valentine, 2010) and contradictory origins of information regarding the potency of such treatment (Bowker et al., 2011; Matson & Williams, 2015). The above claims may not be the case in KwaZulu-Natal province and other parts of South Africa (especially in rural areas).

Furthermore, despite that there are universally accepted and commonly used interventions **(**Bowker et al., 2011); there is still international variance of these interventions (Keenan et al., 2015). As such, factors such as "the child's age, symptom constellation, and symptom

severity appear related to patterns of intervention uptake" (Goin-Kochel et al., 2007; Shepherd, Csako, Landon, Goedeke & Ty, 2017, p. 988). In a related view, some subtypes of these interventions have been scientifically proven usable, while many are not useful. This situation may thereby lead parents to face problems such as selection of wrong/ ineffective, costly, time-wasting, and dangerous interventions (Foxx & Mulick, 2015; Goin-Kochel et al., 2007; Shepherd, Csako, Landon, Goedeke & Ty, 2017).

Moreover, experts have also discovered that some crucial factors in parents' decision-making, and the first is largely related to accessibility and/ or availability (Carlon et al., 2013, 2015). For those living in rural or remote regions (as obtainable in KwaZulu-Natal), and those whose autistic children have reached ages where interventions are not offered, availability is a serious matter. Furthermore, vast distance between the child and the clinic offering the intervention may lead to different intervention types (Matson & Williams, 2015). An instance is the availability of private clinic offering the behavioural interventions but which may get evenly available like other types of interventions or services (Shepherd, Csako, Landon, Goedeke & Ty, 2017). The second factor influencing parental decision-making for ASD interventions is funding (Carlon et al., 2013; Smith & Antolovich, 2000).

It is a fact that raising autistic children is an expensive engagement. In the USA, for instance, the presence of ASD will double the cost of raising a child (Montes & Cianca, 2014). In a report by Norton of Healthy Day (2014), the average annual cost of services of autistic children in the U.S. was $17,000, and that these set of people spend $3,000 more on average per year for visiting doctors and for prescriptions when compared to children without autism. While the report also indicated the school pay much of these costs, the costs of non-medical bills were put averagely at $14,000 per child with 60% of the bills going for the special education services. In another report by Autism Speaks, the world leading non-profit organisation on autism science and advocacy, on March 28th 2012 announced the funded research findings conducted by Dr Martin Knapp, from the London School of Economics, and David Mandell from the University of Pennsylvania. The findings estimated the costs of autism in the society at $126 billion per year in the U.S. – showing a tripled cost since 2006 -- and in the U.K., the cost was put at £34 billion (that is, $54 billion U.S.) annually. The report indicated that the cost of caring for autism in the U.S. alone per year is higher than the

Gross Domestic Products (GDP) of 139 countries as at the time. These costs were based on the estimated 1:110 ratio of prevalence rate established by the Centre of Disease Control (CDC in the U.S.A), and no doubt, the cost may surge as the prevalence rate increases as well.

In a recent (but updated) study funded by Autism Speaks (published in JAMA Pediatrics), it was revealed that the cost of caring for a person with autism for a lifetime can soar higher than $2 million, indicating than the previous estimations are now inaccurate. The report also indicated that the costs for caring for the autistic individuals and individuals with intellectual disabilities were $2.4 million and $ 1.4 respectively for a lifetime. Though subjected to further verifications, the report mentioned about 40% to 60% are suffering from intellectual disabilities with some traits such as limited practical and social skills, limited adaptive habits, and limited intellectual function. In the U.S., autistic children with an intellectual disability up to age 5 were reported to need more than $107,800 per annum, while those from ages 6 to 17 need roughly $85,600 per annum, but translated to $2.3 million in the U.S. and £1.5 million in the U.K. ($2.4 million) in a lifetime. Similarly, the cost for those without intellectual disabilities and aged up to 5 was estimated at $63,290 per annum, $52,205 for those between ages 6 and 17 per annum. These costs translated to $1.4 million in the U.S. and £917,000 ($1.46 million) in the UK (see Pearson, 2017; Autism Speaks, 2012; Norton, 2014).

When parents could not meet this financial obligation, they often move to government and charity organisations to secure financial aid. In KZN, some parents can get disability grants (especially the unemployed or low-salaried parents). Even when a child has been diagnosed with autism, the parents may still not qualify, but it is possible for poor parents to be financially helped for therapy and/ or schooling of their autistic children. Most parents with autistic children in KZN, and other provinces in South Africa, largely bear most of these costs themselves. In some countries or societies, the second main reason parents halt alternative and completing medicines for their autistic child is cost (Christon, Mackintosh & Myers, 2010).

Additionally, there are multiple sources of information available for parents to select the best interventions for their autistic children. These sources include the mass media, the internet, the medical / health experts, and parents and friends of those with ASD. Based on that, better

choice for intervention is obtainable by parents with credible information from medical experts and others (Matson & Williams 2015), who are at that time providing interventions (Hebert, 2014). Elder (1994) also explained that there is a possibility of parents becoming vulnerable to recommendations from professionals while failing to be directed by evidence obtainable from professional practices. Meanwhile, the effectiveness of intervention-related information sought from the internet has been reported to be conflicting (see Green, 2007; Carlon et al., 2015; Shepherd, Csako, Landon, Goedeke & Ty, 2017) even when such report comes from autism associations from the national level (Stephenson et al., 2012); it seems that parents rarely patronise scientific reports in different literature due to inability to comprehend their lexicon. Research evidence, according to Carlon et al. (2015), is usually replaced with instinctive impression and suspicion.

Moreover, support for ASD interventions could be driven by informal sources such as information obtained from friends, family members or spouses, and such supports are also capable of bringing down damaging emotional behaviours, stress, mental-related health problems experienced by parents of autistic children (see Ekas et al., 2010; Murphy et al., 2006; Zaidman-Zait et al., 2016). Some studies have also indicated that symptoms of depression in parents could be lower when there is ASD-related social support from neighbourhood (Zablotsky et al., 2013). But contrary to the above positive trends on ASD intervention support, mothers of ASD children tend to experience high level of psychological suffering when such support is lower or unavailable (Pozo & Sarriá, 2014). As good as informal support or absence of it looks, its impact on choices made on ASD intervention methods is yet to be sufficiently studied. Despite that, some authors believe in positive results that informal support could bring. Part of it is receiving support for day-to-day support, a mindset that others understand them (Ludlow et al., 2011) and assisting in tackling unmanageable habits (Plant & Sanders, 2007).

Furthermore, parents' severity rating of ASD symptoms could also guide their choice of intervention for the most understood or most visible ASD symptoms noticed to be negatively influencing behaviour or daily or overall function of their autistic children (see Carlon et al., 2013). For instances that include ASD children with communication deficits or difficulties, parents' target would be Speech Therapist; and for gastrointestinal problems, diet-related

interventions would be a target (Shepherd, Csako, Landon, Goedeke & Ty, 2017). Herbert (2014), in relation to the above, explained that as autistic children grow up and lose developmental transformation, specific ASD-related symptoms or difficulties (like communication skills and toileting skill) are usually selected as interventions by parents. Still on the matter, Herbert (2014) further reported that in the event that those traditional interventions (Speech and Occupational Therapies for example) are ineffective, parents could resort to other untested interventions which are neither recommended by health professionals/ doctors nor known to be effective. This is one of the predicaments faced by parents over the methods to adopt in deciding the choice of good interventions, and which could further influence the (dis)continuation of such intervention depending on whether progress was made or there is lessening of symptoms or not (Bowker et al., 2011). Another reason for terminating the intervention could also be a result of satisfaction recorded, or when such intervention is questioned after administering. When the intervention is also perceived a success in a clinic, termination could further arise if the same success is not felt or could be seen as generally beneficial at home (Carlon et al., 2013).

In another opinion on challenges parents face on decision-making, investigations have revealed that identifying safe and right interventions by parents of autistic children remains another struggle they contend with (Call et al. 2015), with another case of unknown risks and side effects which could not start manifesting until one commences the intervention. Presumably, if parents notice any discomfort or pain in their child, they tend to dismiss such intervention (Shyu et al., 2010; Shepherd, Csako, Landon, Goedeke & Ty, 2017). Based on that, parents could finally resort to methods of choosing both certified and uncertified interventions (Call et al., 2015).

Importantly, ASD intervention is known to be critically time-based, and in an effort not to miss the period or for being anxious for ASD interventions, a number of parents may choose or accept unfounded interventions (Matson & Williams, 2015). Parents could also forsake some interventions due to poor management that results from the necessity to care for children with ASD (Shepherd, Csako, Landon, Goedeke & Ty, 2017). In the same vein, Green (2007) corroborated the above point that time-investment constitutes a crucial thought when parents are pondering on the use of untried interventions. Due to huge time required by

some interventions, parents are likely to avoid them and embrace those uncertified interventions marketed to them as those with positive effects within a shorter period (Matson & Williams, 2015).

Though interest on ASD intervention decision-making by parents is increasing (Carlon et al., 2014) research on that aspect of ASD, unlike other childhood disorders, are uncommon (Hebert, 2014), and it is becoming a field on its own (Matson & Williams, 2015). Another notion reiterated by Shepherd, Csako, Landon, Goedeke and Ty (2017, p. 990) is the ability of the professionals to adequately inform parents about interventions that are short-time based, effective, inexpensive, and optimal only if parents' understanding and decisions concerning the interventions for their children with ASD allow for such action. In addition, guidance and support received by the parents as well as how valuable they are may be unraveled during further exploration. ASD interventions in relation to decision-making by parents in KwaZulu-Natal share many traits with what has been described above. Equally, parents will also benefit tremendously when right intervention methods are adopted. In a nutshell, interventions for autistic children entail careful decision-making and choices of relevant, inexpensive and short-timed ones which could be replicated in both urban and non-urban developmental clinics and homes.

2.4.2 Language and Communication in DSM-5

With a special focus on language and communication, both old and new versions of Diagnostic and Statistical Manual of Mental Disorders (4th edition) (DSM-IV-TR), and Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5) congruently embedded some criteria that make both interventions (especially decision-making) and diagnosis more understandable and less complicated for both health professional and parents. In other words, deficits in social communication remains one of the core aspects considered before a child could be confirmed for diagnosis of ASD.

First, linguistics (language) is a universal phenomenon that is culturally tied as each child born in a particular society is expected to acquire a language. However, DSM-5 intentionally omits language and language development from the diagnostic criteria and instead, adds them as part of the descriptors just like eye contact, hands gestures, and facial expressions which

are some aspects of socio-cultural communication (Gernsbacher et al., 2015). Nevertheless, in using DSM-5 for diagnosis, paediatricians, psychiatrists, psychologists and speech pathologists look out for certain signs and symptoms coupled with an extra test known as diagnostic assessment. As difficulties in social communication and restricted, repetitive interests or behaviour have basic diagnostic yardsticks, the social communication criterion that an autistic child must meet (notwithstanding whether such child is bilingual or multilingual) is crucial to this study. In respect of that, prior to diagnosis, these difficulties presented below are related to social communication.

i. Rarely using language to communicate with other people
ii. Not speaking at all
iii. Not responding when spoken to
iv. Not using or understanding gestures like pointing or waving
v. Not using facial expressions to communicate
vi. Not showing an interest in friends
vii. Not engaging in imaginative play

Based on the above, language and communication development and their difficulties in autism are interrelated but largely not identical phenomena (Prelock & Nelson, 2012), but should also be well-understood in terms of core differences manifesting between the autistic and non-autistic children. It is also noted that aspects of linguistic and communication in DSM-5 for diagnosis of autism spectrum disorder cover both expressive and receptive language skills expected of non-autistic children as no evidence has shown that children with autism are at a disadvantage of both expressive and receptive skills (Kwok, Brow, Smith & Candy, 2015).

Researchers have further identified that a child may be diagnosed solely for social communication disorder (SCD) if such a child has no symptoms relating to repetitive behaviours. Therefore, for any diagnosis made for ASD, severity ranking is usually included, and thereby helping in understanding the proportion of support the autistic child will require. The ranking is in 3 categories according to Raising Children Network (2006). They are:

i. Level 1: The child needs support
ii. Level 2: The child needs substantial support
iii. Level 3: The child needs very substantial support

Overall, the above severity ranking is a crucial fact needed for accurate and speedy intervention, and management of autism in children. It is also significant for psychologists, paediatricians, speech therapists, and other allied professional caregivers to make parents or guardians of autistic children aware of such severity level as applicable to individual child diagnosed. This will lessen unwarranted parents' anxiousness for hastened remedy usually accompanying such diagnosis.

2.5 Neurolinguistics and Human Brain System

This is not a new branch of linguistics but a crucial one that deals with the biological system and its connectivity with human language. Neurolinguistics emerged from coinage of "neuron" which could be described as brain networking and configuration, and "linguistics" which entails language of any type, and thus comprising non-verbal and verbal behaviour (see Antic, 2008). Relatedly, neurolinguistics studies the nexus existing between language communication and numerous parts of human brain and their functions. This suggests that neurolinguistics delves into production and understanding of language/ speech/ communication, and in order to have a full grasp of this field, one needs to explore a combined theory behind neurophysiology or neurology (which could be described as a study of brain structure and its functions) as well as linguistics (the field of knowledge on how language functions and its structure).

Often, a human being is found at the centre of most questions and studies on neurolinguistics, maybe because of their linguistic nature and language needs and usage. Whitaker (1985) maintained that human beings as higher mammals employ language creatively and thereby drive studies of connection existing between their language and their system of language production and comprehension. Conducting a meaningful investigation therefore on human language and its system will entail references to how human central nervous system works.

2.5.1 The Human Nervous System and the Brain

The brain anatomy in both vertebrates and invertebrates is intricately complex, maybe as a result of its structure and the functions it performs. In the central nervous system (CNS), the two structures found are the brain and spinal cord, and the peripheral nervous system that accommodates nerves which transport impulse from up and down the CNS. It has been noticed that up to 10 billion neurons are present in the human brain (Pelvig et al., 2008) and

these cells channel signals to one another creating the connection of 100 trillion synapses (Toro et al., 2008). In another report, human brain is said to house up to 100 billion neurons or nerve cells as well as glial cells (neuroglia) which all together safeguard neurons. At a time, it is said that each neuron may get connected to another 10, 000 neurons as they transmit signals to one another through up to 1,000 trillion synaptic connections which by estimate equal 1 trillion bit per second processor of computer.

There is a variation although, about the capacity of memory in human brain, Mastin (2008) put it on a range of 1-1, 000 terabytes. In the opinion of Guyton and Hall (2006, p. 543) "the nervous system is unique in the vast complexity of thought processes control actions it can perform. It receives each minute literally millions of bits of information from different sensory nerves and sensory organs". It is noteworthy that neurons are of different sizes and some of its notable parts in human brain are shown in the figure below.

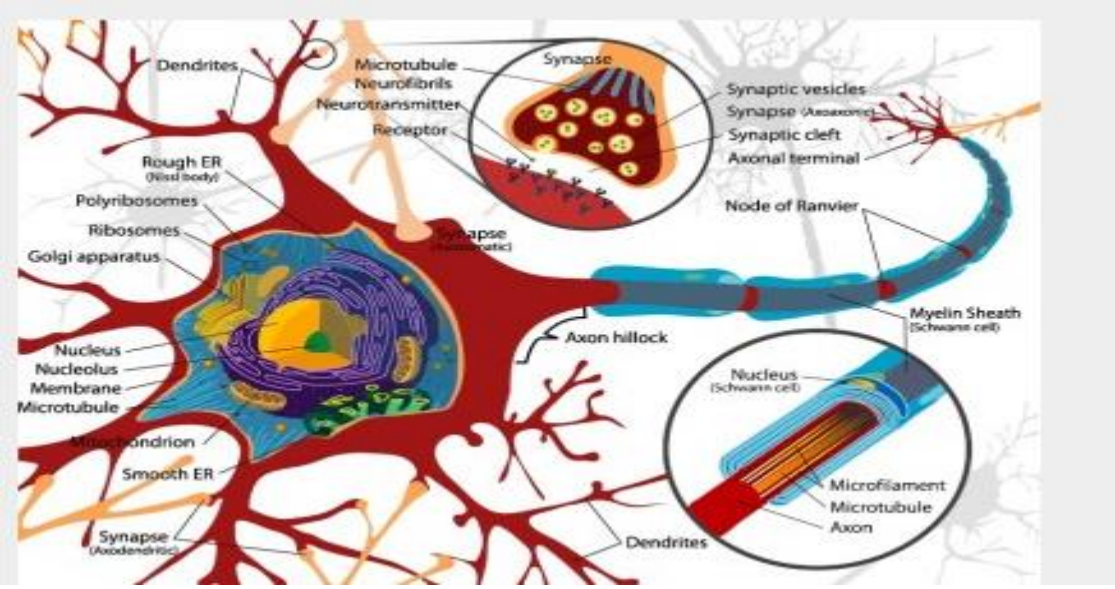

Figure. 2.1 Diagram of a neuron (Source: http://en.wikipedia.org/wiki/Neuron).

In Figure. 2.1 above, soma is a cell body, with branches known as dendrites. Axon conducts all the nerve signals at the axon's end, while the terminals of the axon receive the electro-chemical signals transferred over a synapse. In addition, the role of synapse significantly evolves memory that functions as information depot that is found at the cerebral cortex which aids in organising language in most times. Memory, therefore, is a working part of the brain that invaluably assists in every thinking process and in recalling concepts (see Kehinde, 2014).

Other relevant biological phenomena are usually in the human central nervous system, and as presented above, a neuron and many of its parts work to achieve a well-coordinated neurocognitive capability or behaviour. Sensory receptor is another part in the CNS that is associated with various activities such as tactile, visual, and auditory, among others. These are usually brain-related reactions through sensory receptors. From the receptors, sensory information is transmitted from somatic portion where the sensory receptor is located. The brain parts are briefly explained in the section below.

2.5.1.1 Notable Parts of Human Brain and their Functions

The function of human CNS is found at different phases, namely, *the sub-cortical* (that is, the lower brain) phase; *the cortical cortex* (known as higher brain), and *the level of spinal cord*. All these are functioning in some specific manner. Meanwhile, the brain is the highly-wired, hugely sensory, and vastly networked or interconnected part of a human being. The three main elements of the brain are the *brain stem, the cerebellum and the cerebrum***.** Figure 2.2 shows the notable parts of the human brain, while Figure 2.3 represents the major lobes found at the cerebral cortex of the human brain.

(i) The brain stem comprises the following: the *midbrain, the pons,* and *the medulla***,** which all connect the spinal cord with the brain, and also regulate activities such as: breathing, heart rate, digestion and some other autonomic processes.

(ii) The cerebellum performs some specific but vital roles of motor control, and balancing; while the cognitive-related functions include: procedural memories processing, language, attention, emotional regulation like fear and pleasure.

(iii) The cerebrum (or forebrain) a big storehouse of memory (Guyton & Hall, 2006), is by volume 75%, and by weight 85% of the brain and is separated into two hemispheres by a *longitudinal fissure* **(**that is, a large groove). These hemispheres are connected by *corpus callosum*, that is, a bundle of nerve fibres, and by other smaller connections popularly known as *commissures*. Furthermore, the cerebrum is covered with *cerebral cortex/ neocortex*, a sheet with neural tissue that covers some other brain organs such as *thalamus* that involves and helps in transmitting information from the spinal cord, brain stem to the cerebral cortex, as well as *pituitary gland, hypothalamus, hypocampus, basal ganglia, pons, cerebellum,*

medullar, and *mesencephalon*, found at the subcortical, the lower part of the brain (Mastin, 2018).

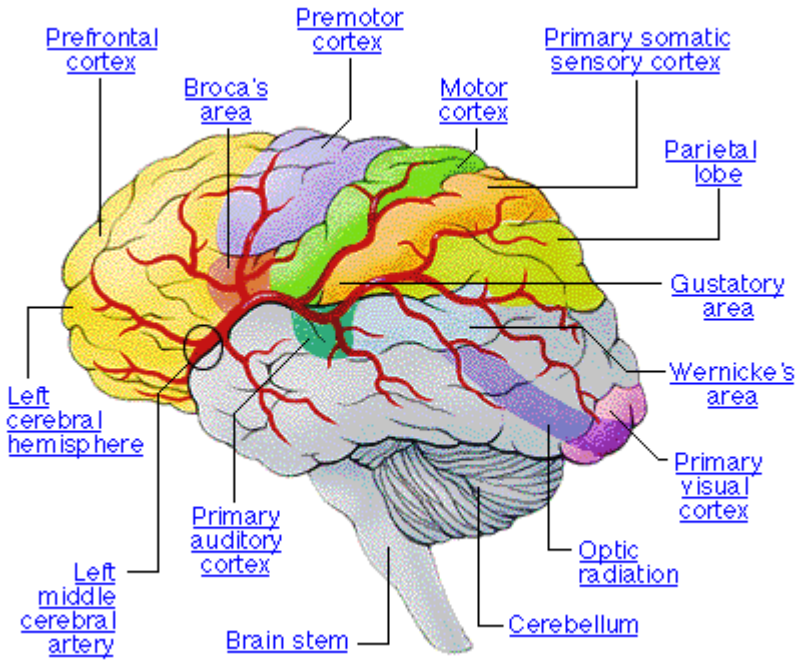

Figure 2.2 Various parts of human brain (Source) https://schoolworkhelper.net/the-nervous-system-autonomic-central/.

According to Guyton and Hall (2006), the above has a very large number of subconscious actions being manipulated therein. For instance, basal ganglia play an invaluable role in how memory functions. Also, in the presence of any damage to cerebral cortex, actions such as salivation, tasting, responding to pinching / pain, anger, and sex, among others, have been reported to be untampered with (see Reeve & Swenson, 2008; Kehinde, 2014). In addition, Mastin (2018) explained that of all neurons in the brain, 90% is situated in the *cerebral cortex***,** with grey matter from which the surface region of the cortex is made up, and also the white matter with mainly *myelinated axons.*

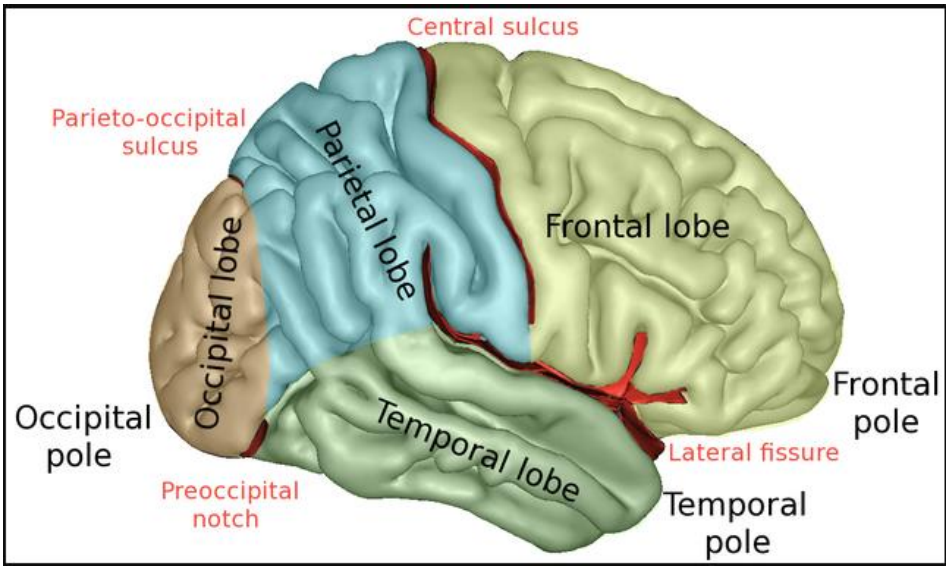

Figure 2.3. The human cerebral cortex showing the four major lobes (Source) https://commons.wikimedia.org/wiki/File:LobesCaptsLateral.png.

Apart from the key functions of the cerebral cortex, which include thought, perceptual awareness, attention, language and consciousness; the cortex's division into four **lobes** or regions makes the two hemispheres to be possibly covered. These *lobes are* (i) *The frontal lobe* which is actively responsible for mental function on higher scale, and conscious thought; (ii) The *prefrontal cortex* which is the part of the frontal lobe that plays a crucial role in retaining (the non-task based) long-term memory, and processing of short-term memory; (iii) *The parietal lobe* that is concerned in navigating, and (iv) *The temporal lobe***,** a division of the cerebral cortex that involves and facilitates sounds and smell senses, meaning-making processing (semantics) in both vision and speech, as well as processing scenes, faces, which are examples of complex stimuli, and also involves long-term memory formation (Mastin, 2018). Also, in the description are two other parts of the brain known as *hippocampus* and *amygdala* that play some specific roles. While *hippocampus* helps in new neuron growth, reworking short-term memory to long-term memory, spatial memory and behaviour control; *amygdala* aids the smell sense, regulating sexual and social behaviours, processing of emotional reactions among others (see Mastin, 2018).

As the whole brain itself, cerebral cortex is important for maintenance of regular cognitive function, sensory and input interpretation from various sources. In addition, it is within the cerebral cortex that processing of basic information in the brain really happens. While

understanding language, thinking, and perceiving are said to be the cognitive function of cerebral cortex, it could also help in knowing personality, and determining intelligence (Kehinde, 2014).

2.5.1.2 The Nature and Functions of Left and Right Hemisphere

As complex as those above actions look like, their activities are not separately carried out in the body to achieve a smooth and adequate response. Now talking about cerebral hemisphere cortex—which in general has been described as an embodiment of higher intellectual and integrative capacities in humans (Reeves & Swenson, 2008) comprising the right hemisphere, and the left hemisphere, the brain part that is responsible for language and communication which is the primary focus of neurolinguistics.

First, the right hemisphere is considered inferior functionally to the left hemisphere especially as touching representation of speech. Based on that fact, this hemisphere has been labelled the "non-dominant" but not without some functions which include: generating verbal inflection, musicality, identification or detection of voice (Reeve & Swenson, 2008) among others. Concerning the left hemisphere, many views have been expressed to show that this part of the human brain is wired magnificently in relation to speech production and comprehension.

Reeve and Swenson (2008) further reported that 97% of the population has their language at the left hemisphere with little or no added contribution made by the right hemisphere. It was also reported that for speech functions being represented in the right hemisphere, only 3 out of 100 will be significantly involved; while there will be also significant speech representation in bilateral mode in 2 out of the 3, with remaining 1 having dominance in the right hemisphere.

According to Afifi and Bergman (2005), Gustav and Paul Broca revealed how cerebral functions, as well as its capability in 1865, and thereafter being employed until a new concept -complementary specialisation of the hemisphere are used to describe both categorical and representational hemispheres. Jabar (2006) and Adegbite (2003) explained that while the categorical hemisphere is concerned with higher mathematics, logical and analytical operations, and sequential-analytic processes involving language functions; the

representational hemisphere deals with visual-spatial that involves emotions, and identification of faces and structure. The categorical hemisphere is more related to autism than the representational hemisphere.

2.5.2 Language in the Brain and Description of Autistic and Non-autistic Brain

Could it be right to opine that a certain portion of human brain houses language? A handful of studies have indicated that language-related activities such as reading, listening, speaking, and comprehension make use of some brain region than the others. Recently, in what seemed to be a novel breakthrough for neuroscience, scientists (comprising a team of researchers from America) have found 180 distinct regions after mapping the cerebral cortex, the outer layer of human brain (Sah, 2016).

Meanwhile, some eminent parts of the brain are in association to ensure that the whole brain works efficiently. These portions include *the parietal temporal occital* (which is found between the *visual cortical and somatesthetic*, but reaching up to *the posterior portion* found in the temporal lobe); frontal area of the brain (found at *premotor's front area*), and the temporal itself (which reaches the *limbic system* from the lower region of *the temporal lobe*). While humans share the same brain structure with some animals such as rats, mice, and other primates (Sah, 2016), those areas above have been identified to be different when compared to other animals (even the ape family). Salami (2005) and Ganong (2005) explained that incomparable to its structure, the overall functions of human brain (which is speculated to be larger and heavier than the apes') is significant.

Generally, the human brain performs the following 6 central functions which are memory, vision, language, mood, personality and motor skills – and what happens when things go wrong (see Abbott, 2016). Talking about speech and language, several brain portions such as *Broca's area*, *Wernicke's area*, and *the Angular gyrus***,** and the *Insular cortex* are responsible. The figure below further explains each of the portions, they are believed to have been working in a network system and not independently in order to process the meaning and context from words or and word sequence (Abbott, 2016).

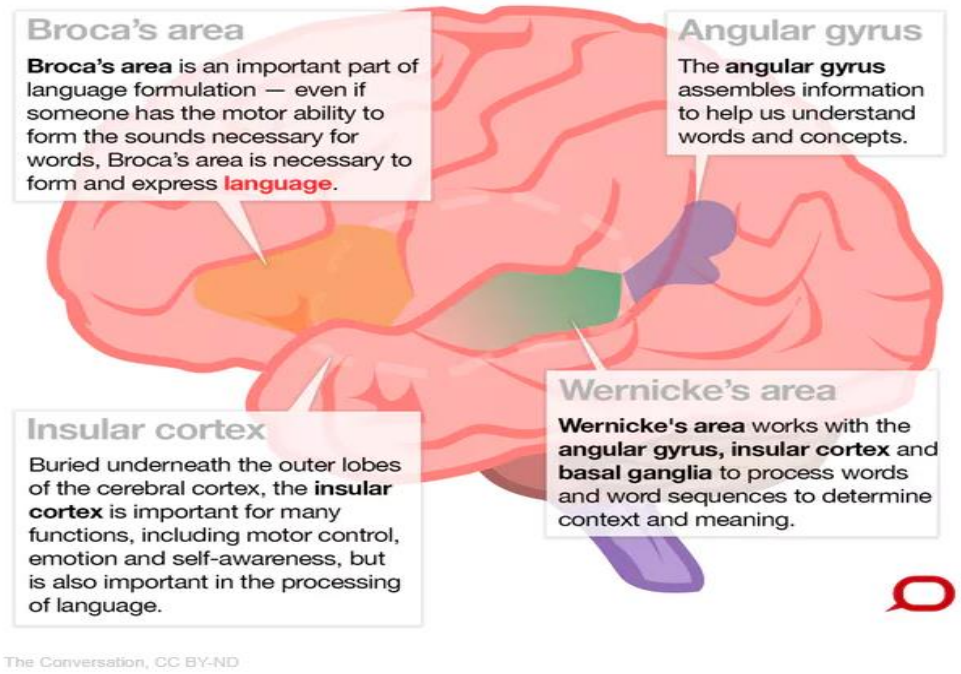

Figure. 2.4. Key language portions in the human brain (Source: Abbott, 2016)

As mentioned earlier and identified in Fig. 3 above, each of the language portions are further explained below.

i. **Broca's area:** Discovered in 1861 by the French neurologist, Pierre Paul Broca (1824-1880), this portion is located in the parietal (frontal) lobe in the left cerebral hemisphere of the brain, and it is responsible for the production of speech as well as articulation. The ability to employ words correctly, and use language (speech and writing forms) accurately is associated with this brain region. In other words, Broca's area explains (in)ability of grammar articulation and how to comprehend it too (see Sunday, 2010). There is a belief that in earlier childhood, two languages learnt simultaneously could be stored in the Broca's area with a further explanation that the L1and L2 of an adult is not stored in the same place.

ii. **Wernicke's area:** Wernicke's area otherwise called (the tertiary association area, the gnostic area, the knowing area, general interpretative area etc.) is named after a German neurologist, Carl Wernicke (1848-1905). Wernicke's area is a significant part of the brain that plays an active/ primary role in language comprehension and language processing (either written or spoken) by working with other parts of the brain such as basal ganglia, angular gyrus, and insular cortex. It also aids meaning-making and understanding of communication

context. Through a neural pathway, this portion of the brain is connected to Broca's area from the posterior end of the superior temporal lobe where it is situated. Furthermore, Wernicke's area apart from the above functions also aid in differentiating similar sounds, naming objects or things, among others.

iii. **The Angular gyrus:** This is a portion of the brain that is linked to language-based information of multiple types, but found at sensory areas (visual, auditory, and somatic association areas) which thereby brings about higher level of brain functionality that could be termed "intelligence". Through the use of position emission topography (PET), scan has revealed that when there is less activation of Angular gyrus, it could be responsible for language learning disabilities such as dyslexia and agraphia. In another view, the nearness of Angular gyrus to the occipital lobes (which involves in analysing visuals); the parietal lobes (which concerns tactile sensation processes), and the temporal lobes (that involves sound processing) may be highly responsible for ideas, sensation, and mapping or association of words with several objects or images (Abbott, 2016).

iv. **Insular cortex:** This portion of the human brain is found under the outer lobes of cerebral cortex and some of its functions include self-awareness, motor control, emotion, and chiefly language processing.

All of the above brain regions function collectively in a network mode in word processing, word sequencing, and meaning and context determination. This, according to Abbott (2016), has aided human receptive and expressive language abilities. In another instance, a network between Wernicke's area and Broca's area indicates that information received from Wernicke's area is converted into well-articulated and vocalised form at the frontal cortex of Broca's area through the insula to the motor cortex that aids different speech organs' movement (Ganong, 2005; Afifi & Bergman, 2005). Importantly, both Wernicke and Broca's areas are strictly language-based regions in the brain where distinctions are made between language and speech comprehension, and language or speech articulation planning (Afifi & Bergman, 2005).

2.5.3 The Nature of Language Acquisition, Production and Comprehension of Bi/multilingual Autistic Children

Below, some notable views on language acquisition, language production, and language comprehension are discussed in relation to bi/multilingualism and children with ASD.

2.5.3.1 Language Acquisition

Perspectives from biolinguistic programme has revealed how sentences and their related-meanings are evolving in children and how both children and adults use them (Crain, Koring & Thornton, 2017). The authors further stated that this programme also involves how the sentence pairing system comes to play, and how it is represented in the mind/ brain. Naturalistic observation as one of the underpinning observations of biolinguistic perspective to acquisition of language shows that a complex but rich linguistic system is internalised by the entire typically-developing children within a short period (few years). For children, it is established in biolinguistic approach that language acquisition is effortless and rapid since this acquisition has its foundation and builds on the human biological endowment that is already predetermined (Crain, Koring & Thornton, 2017). This biological endowment of human is what Chomsky referred to as Universal Grammar. Once again, in biolinguistic approach, children that physically developed behave linguistically like adult speakers in their L1 (or MT) as "human faculty for language is viewed as a domain specific perceptual system (i.e., a module), this approach contends that all children come to the task of language acquisition armed with the principles and parameters of Universal Grammar" (Crain, Koring & Thornton, 2017: 123). The modularity and biological bases of language acquisition could be also found in language perception and production which are both considered first as one module (because the same grammar and the same structural constraints regulate both listening and speaking), and secondly, as biologic (because inherently, speech production and its perception are both motoric, and as observed in human language, "neural representation of the utterance that determines the speaker's production is the distal object that the listener perceives…") (Liberman & Mattingly, 1985, p. 30).

Relatedly, Krashen (1982) stated that language acquisition could be viewed as a natural way of learning a language, and Fadoro (2011) explained that language acquisition is an incremental development of power to use language in any communicative situation naturally. Furthermore, language acquisition has been linked to mother tongue (MT), that is, the language a child unconsciously exposed to while growing. This exposition usually comes

from the mothers' communication with the child during prenatal, postnatal, infancy periods and beyond. In a related view, Surakat (2010) explained that a fundamental factor to be noticed is language exposition is the age of each child as this is crucial to linguistic maturity. What this suggests is that the biological age of an individual could be viewed in terms of how mature his/ her language is and as such making a child of 7 to be linguistically matured than another who is 10.

On language acquisition stages, though gradual, biological variations usually determine the process, and the period that is involved is dynamic in terms of different variables that could show up. These stages are:

(i) The pre-language stage which is otherwise known as pre-linguistic stage that spans from 3 months to 10 months. The major feature of this stage is sound making known as *cooing* and babbling. However, Scovel (1997) stated that babbling does not translate to acquisition of segmental sounds acquired from the mother. According to Paul and Cohen (1982, p. 281), this stage could be called "the first year of life", and this is characterised also by earlier interchange of an acute gaze accompanied by conversational vocalisation between the infants and their parents/ caretakers. These proto-conversational interchanges have been identified as possible reason for development of turn-taking in linguistic conversation (Jaffe, Stern & Perry 1973; Paul & Cohen, 1982). However, the degree of such interaction may be unknown for language learning purpose (Snow, 1981), but "early reciprocal routines do appear to provide mothers with an ideal opportunity for embedding the child's actions in a meaningful social context" (Paul & Cohen, 1982, p. 281). During this stage as well, detection of language disorders such as autism may not be visibly noted and thereby makes it difficult to identify the autistic despite that the time is for the infant to transit from conventional communication to paralinguistic stage.

(ii) The holophrastic stage: this stage begins from 12 months and lasts in the 18th month with the noticeable feature of saying first identifiable words usually mono-syllabic nominal utterances. Huttenlocher (1974), Sachs and Truswell (1976) explained that children at this period express genuine lexical comprehension, as well as giving appropriate responses to words beyond the content of everyday games. They also step up their expressive and receptive vocabulary. Furthermore, children also use social words such as bye-bye, hi, hello, for usual salutations (Bloom & Lahey, 1978), and apart from the above, other words like

there, all and *more* are employed to express ideas on appearance, and recurrence, which are in relation to how children view objects as permanent (Bloom, 1973). Such a view shows that each word uttered is linkable to a referent which could be semantically and contextually decoded. Ideas at this stage are presented in the form of single words but used in coherent sentences (Scovel, 1992). Based on that notion, words such as *key, that, yes, no, see*, etc. could for the infant stand as a sentence. This experience could manifest also in adults (see Kehinde, 2014), and in relation to autism, it may contribute to late diagnosis as both autistic and non-autistic manifest the same linguistic behaviour at this stage.

(iii) The two-word stage: this stage begins at 18 months and can last up to 24 months. By this stage, the development in child language behaviour is improving and neurotypical children will be able to combine various words in their utterances. Kehinde (2014) reported that lexico-semantic features such as semantic extension, semantic transfer, and semantic shift could be noticed during this stage. For instance, all animals with four legs could be called 'cat'. It has been established that towards the end of the second year, vocabulary would have increased to 50 words, and thereby paves way for the telegraphic stage (see Brown, 1973).

(iv)The telegraphic stage: this is the two-word period where adult-like communication begins to manifest. This stage correlates with the period when autism could be noticeable. The period of linguistic maturation is telegraphic as many omissions could be voluntarily or carelessly committed while communicating. It is expected that the combination of both *lexical words* (nouns, adjectives, verbs, and adverbs) and *functional words* (prepositions, conjunctions) are usually employed. For instance, words indicating "possession (daddy shoe), location (sit chair), elaboration of earlier expressions of existence (no milk), disappearance (all gone cookie), and recurrence (more candy)" (Bloom, 1970, in Paul & Cohen, 1982, p. 282). However, elision of words at this stage does not largely affect the meaning of the sentences, and children adjudge themselves right even after correct version has been heard. Those words coupled together were referred to as *high-information words* according to Dale (1976), while those elided were termed *low-information words*. As observed, children at the age of 30 months can imitate many words from one or more languages and those words tend to grow at the of age 36 months; hundreds of such words could have been stored in mental lexicon of such children (Kehinde, 2014). Similarly, at the pre-school stage (from age 2-5), language use in the telegraphic period gradually transforms to full grammatical utterance, and additionally growing in vocabulary that per day, 8-11 new words could be added, and at the

same time, the child keeps on processing and approximating the syntax of his/ her home language (Paul & Cohen, 1982). Meanwhile, at this stage, parents as well as the psycholinguists could vividly notice the nature of children's expressive and receptive languages, and in relation to ASD, executive functions that cover stereotypical behaviours and socio-communication of the autistics.

Piaget's work stirred other works on cognitive development on individuals despite that it has been challenged, alluding to several reasons such as the inability of the theory to account for varied child's performance across many knowledge domains such as understanding of language, logic, mathematics, and physics (see Weiten, 1992; Lourenço & Machado, 1996). These scholars and some others believed that development does not always follow an easy path as explained by Piaget, meaning that children's development might have been underrated. In the same token, such underestimation has been rebuffed especially by advocates of ToM, who contended that children aged 4 to 5 have sophisticated comprehension of personal mental processes just as other people (including the older ones) do. For instance, these children can take another person's perspective indicating these children are far from being self-centered, unlike what Piaget conceived. Some researchers opined that children aged 3 years can even comprehend that some people may possess varied perceptions of the same thing like scene (see Cherry, 2019), though that may not be applicable to all children with ASD.

Another notable criticism against Piaget's theory of cognitive development by scholars such as Vygotsky was Piaget's inattention to culture and environment which influence individuals' cognitive development. Piaget's children grew up and were schooled in a Western culture and environment. Many scholars believe that children's intellectual development is also attributable to the environment and culture from which they grew up, and thus influence their cognitive responses (see Gray, 1994). Notwithstanding more criticism other than the above, Piaget's studies on children's cognitive development remain a pioneer and a directive for most clinical methods. The theory has also contributed to how many psychologists and related researchers view abolishing thoughts such as children being a smaller copy of adults but then reinforcing the notion that children have fundamental ways of thinking which are from adults.

2.5.3.1.1 On the Notion of Language Acquisition Device (LAD)

Having explained the language acquisition stages, another debate on language acquisition device (LAD) should not be overlooked as it widens the understanding of certain phenomena in psycholinguistics and its related fields. An instance is language acquisition failure which keeps on receiving different attention. In 1965, Chomsky and his colleagues argued that children innately have language acquisition device (LAD) which ultimately makes children to select voluntarily the grammar that seems most efficient, though this assertion has been modified over the years as many scholars believed that human beings are infused with inborn capacity to learn language no matter where one lives (Slobin, 1994). In 1986, Chomsky came up with another idea known as *core-grammar* that explained some Universal Grammar (UG) parameters which are said to be fixed, and also enabling children during language acquisition to identify and select available options in their language. Universal Grammar, according to Crain, Koring and Thornton (2017) is the starting point of LAD. Some fundamental principles of Universal Grammar (UG) commonly found in human languages, and that UG accounts gives insights to notable differences that characterized human languages including insight on how language variation is linked to encoded parameters. UG has therefore shown to be a system involving principles and parameters. Similarly, it has been indicated that children rely on fixing UG parameters, and thereby tailored their language learning towards some particular pathways (Aitchison, 1990).

As a result of the need to completely lay down some arguments especially those that stemmed from behaviourists' claims (like the acclaimed environmental influence on language acquisition of children via stimulus response activity), the claim (in view of LAD) that language is biologically programmed from Chomsky, and that of UG advocated by the psychologists were dropped (Scovel, 1997). The most important resolution was the presence of selection process that offers universal principles in language acquisition which furthermore showing that without explicit language teaching, children can acquire language(s). Similarly, in relation to language disorder such as dyslexia, aphasia, autism etc., the above suggests that children with such disorders are subjected to the same neurobiological and psycholinguistic behaviour (Ojo, 2013; Kehinde, 2014). Language acquisition in overall sense should be naturally, and effortlessly acquired as language is known to be an integral part of human brain system, and as children grow, so their brain develops and thereby organises their language in a natural way common to human beings. The contrary may however happen if any neurobiologic disorder inhibits the brain system as reported in some studies on ASD.

2.5.3.1.2 Language or Speech Production

Whether in a bid to produce one or more languages, the process mainly involves the act of mapping and structuring concepts into words, and when this involves writing and speaking, the elements, the stages involved are not quite varied. That is, from the spot of linguistic forms encoding which makes use of motor system, to linguistic; from transmission (from the speaker to the hearer through auditory system), to decoding of linguistic form already transmitted, as well as securing semantic interpretation. Overtime, there was a debate on the independence and interdependence of those stages mentioned and thus gave birth to *serial model* and *connectionist model*. While the former maintains that language production has many stages such as phonology, syntax, semantics etc.; the latter claims the interaction among phonology, semantics, syntax and morphology (Pinker, 1994). However, Griffin and Ferreira (2006) presented a model showing the processes of language production. The modified version of the model is shown below.

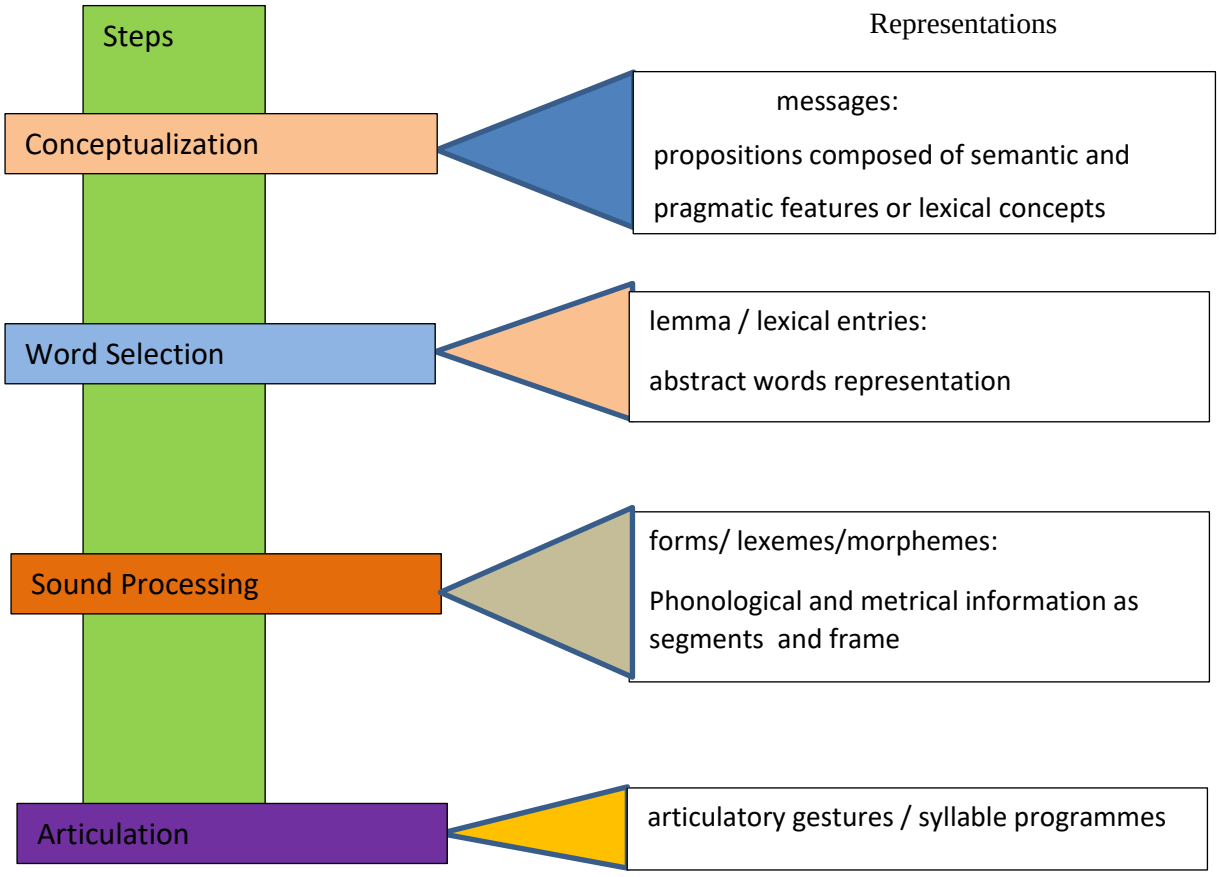

Figure 2.5 Griffin and Ferreira model of language production processes (2006, modified by the researcher, 2021).

At the level of word selection, *content words*: nouns, verbs, adverbs and adjectives are specifically meant to bring semantic clues after the words have been well-ordered during language production. Similarly, to achieve syntactic planning, *function words:* pronouns, prepositions, and conjunctions are selected. At sound production and processing stage, meaningful sounds are formed from phonemes, syllables and words, and pronouncing appropriately is crucial to individual articulation. Furthermore, to do this will require the ability to recall linguistic data or information in the mental lexicon (ML). The nature of such retrieval may be quite different in the autistics due to lack of theory of the mind for instance. Similarly, Griffin and Ferreira (2006) explicated that speech production commences from mental conceptualisation to articulation, therefore, for the bilingual autistic children, the same process is expected in either L1 or L2, and the main challenge may be neurobiological or neurocognitive anomalies underlying language production -- a phenomenon which is not universal (see Gernsbacher, Morson & Grace 2015) and which could negatively impact word and sentence generation, for instance in unordered retrieved *lemmas* that may lead to wrong syntactic structure eventually (see Kehinde, 2014).

2.5.3.1.3 The Concept of Language Comprehension

Language production and comprehension processes are daily tasks peculiar to human beings and these may be investigated using psycholinguistic and neurolinguistic imports. Altman and Kamide (1999) stated that inference is not made after the listeners have listened to the whole sentence, but they wind up meaning along the making of the sentence. Perceiving meaning from the utterance is a neurobiologic process in which brain regions such as Broca's areas and Wernicke's areas, together with insular csortex, angular gyrus and basal ganglia are activated. For instance, Broca's area is active when violations to already known grammatical rules are made. Despite that, on the other side of the brain, neuroscientists are doubtful about the core function of the region after several studies on human brain regions have been conducted (Cheung, Meyer, Friederici & Koelsch, 2018).

In relation to the above, psycholinguists have reported both *low-level perceptual* processing and *word recognition* as two components identifiable with language production. While the former is related to cognitive processes connected to analysis of audio and visual already acquainted with; the latter is concerned with comprehending an acoustic waveform which is a certain output (Nwachuckwu, 1991). By extension, recognising denotations, technical words, and understanding the context of usage could make further one's comprehension successful

but only if the listener and speaker have functional cognitive and language acquisition processes.

Broadly speaking, examining the nature of language acquisition, language production and language comprehension (or language development) of the bi/multilingual autistics may be difficult in terms of maturation age in which the symptoms manifest and its subsequent diagnosis. Many studies have confirmed that investigations into communication development will immensely be valuable to have deeper understanding of language acquisition and its nature and not only the disorders like autism alone (see Paul & Cohen, 1982). What this portends for research like this is that multiple approaches could be used to view both nature and development of language acquisition, production, and comprehension. The approaches for instance comprise the biological, cognitive, neurocognitive and linguistic characteristics and explanations which are essentially needed to determine or understand the complexity of language and communication practices (and competence) of the autistics.

Firstly, the interrelatedness between cognitive development and language in primary autism (and in childhood aphasia) is noticeable in terms of disruption, while developing vocabulary as well as abstract thought (see Caparulo & Cohen, 1977) aids understanding of language and thought, subsets of cognitive development skills which may be used to show or predict language deficits and disturbances, the relationship between limited linguistic capability and the organisation and development of high-level cognition, possibility of developing lesser problem-solving skill (Paul & Cohen, 1982). Second, the above phenomenon in the course of language development will be useful insight not for only diagnosis and prognosis of autism, but also for understanding the nature and interrelationship between language and thought in normal children. Paul and Cohen (1982) further posed some questions on the influence that earlier mother-infant interactions / dialogues may have on the language capability of their children. As relevant to this study, mother-infant interaction can help to spot problems associated to language acquisition, production and comprehension, and thereby resulting to early discovery of ASD, and possibility to make progress of these children's social behaviour and language / communication practices.

Contrary to what many have reported about atypical language development employed in defining ASD, recent review by Gernsbacher, Morson and Grace (2015) has shown that abnormality in language development does not fit any longer, just as the latest diagnostic

criteria of ASD is also silent about it. The authors maintained that language development is usually retarded, and not aberrant; "that a delay in language development is not unique to autism; and that language development in autism is remarkably heterogeneous" (Gernsbacher, Morson & Grace, 2015, p. 879). The most pronounced of this delay according to the review include expressive and receptive language aspects. The expressive language manifests in terms of delays: in speaking first words (Charman et al., 2003; Matson et al., 2010); in speaking first phrases (Grandgeorge et al., 2009; Kenworthy et al., 2012; Pry et al., 2011); and in making the first grammatical sentences or utterances (Anderson et al., 2007; Wodka et al., 2013). The review also revealed that some studies that assessed the volume of expressive vocabularies of the autistic children during their development, have pointed out that when compared to normal children within the same age-bracket; the expressive vocabularies of the autistic children are smaller (Charman et al., 2003; Fulton & D'Entremont, 2013; Kover et al., 2013; Luyster et al., 2007; Luyster et al., 2008; Miniscalco et al., 2012; Sandercock, 2013; Stone & Yoder, 2001, in Gernsbacher, Morson & Grace, 2015).

Concerning receptive language, there is difficulty to making reliable measurements for under-aged children, and thereby making valid conclusions a challenge. One of the sources of these challenges is using the parents' reports for the measurement of receptive language (Fenson et al., 1993; 2007) which may originate from measures such as MacAthur-Bates Communicative Development Inventory. Though this misestimate could not be avoided, studies (such as Charman et al., 2003; Fulton & D'Entremont, 2013; Luyster et al., 2007; Luyster et al., 2008; Maljaars et al., 2012; Miniscalco et al., 2012; Paul et al., 2007, 2008; Vanvuchelen et al., 2011) have used MacArthur-Bates Communicative Development Inventory and established that the receptive language development of the children with autism is delayed. Similarly, those standardised and objective measurements such as Reynell Language Development scale (RLDS), Reynell and Gruber (1990), Miniscalco et al. (2012), Vanvuchelen et al. (2011), the Peabody Picture Vocabulary Test (PPVT), Dunn and Dunn (1997), British Picture Vocabulary Scale (BPVS), Dunn et al. (1997), Grigorenko et al. (2002), Howlin (2003), Kover et al. (2013), the Clinical Evaluations of Language Fundamentals (CELF), Semel, Wiig and Secord (1992, 1995, 2000, 2006), Aman et al. (2004), Sigman and McGovern (2005), Wisdom et al. (2007), the Mullen Scale of Early Learning (MSEL), Mullen (1995), Luyster et al. (2008), Sutera et al. (2007), Swensen et al. (2007), the Preschool Language Scale (PLS), Zimmerman et al. (1992, 2002), Hudry et al.

(2010), Jasmin et al. (2009), Walton and Ingersoll (2013), the Psychoeducational Profile-3 (PEP-3), Schopler et al. (2005), and Fulton and D'Entremont (2013) of receptive language development of autistic children have also reported delay.

Furthermore, there is a confusion or lack of consensus about the development of both receptive and expressive language of the autistic children, and in bi/ multilingual situation. It could also be deduced that the degree and period of such delay may be extreme and longer respectively due to language processing phenomenon and the possible brain-related disruptions. Precisely, after measuring the language abilities at one time or the other, some studies have maintained that language development of both typically developing and atypical young children are the same in terms of the number of words both children produced (Goodwin et al., 2002; Gernsbacher, Morson & Grace, 2015), and for the teenage autistic and non-autistic individuals. Their language development was described by some studies as the same in terms of the number of words understood by these teenagers (Åsberg, 2010; Henderson et al., 2011; Paul et al., 2005 in Gernsbacher, Morson & Grace, 2015), and in another view, the quantity or quality of written language produced and the number and length of words / sentences or their complexity were all found to be same (Troyb, 2011 in Gernsbacher, Morson & Grace, 2015).

In sum, Gernsbacher, Morson and Grace (2015) reported that some recent studies indicated delayed language development of the autistics that is the same when compared to the non-autistics in both receptive and expressive language. However, contrary to the above, some studies reported nothing to indicate that the language development of both autistic and non-autistic is delayed. What that further suggests is that delay in language development of the autistics is a usual but not a global phenomenon of ASD. Furthermore, it was reported that language and autism traits develop independently. A report from a wide-scale investigation of 3000 pairs of twin babies showed that the degree of language development was not genetically or phenotypically related to the severity of autistic symptoms (Taylor, Charman, Robinson, Hayiou-Thomas, Happé, Dale & Ronald, 2014 in Gernsbacher, Morson & Grace, 2015). As observed, the independency of language and autism empirically reported may be responsible for the variation noted in some findings as well as in the heterogeneity and variability language development of the autistics (Gernsbacher, Morson & Grace, 2015). It is important to note that this form of language development is applicable to either the monolingual or the multilingual autistic and non-autistic toddlers.

2.5.3.2 Linguistic and Communication Competence of Bi/Multilingual Autistic Children

In this section, some vital topics that relate to linguistic and communicative competence of children raised by bi/multilingual caregivers are discussed. As mentioned in chapter 1, bi/multilingual children with ASD is used in this study to refer to children whose parents and other caregivers are bi/multilingual.

2.5.3.2.1 Linguistic Competence and What it Denotes

Linguistic competence and communicative competence are two concepts that have to do with knowledge of individuals about a language and its use. The basis of competence is found outside linguistics, as it has been playing some crucial roles in some disciplines such as sociology, personnel management, pedagogy, and psychology. According to Lehmann (2007), competence is a set of skills or abilities that are cognitively governed by a certain domain. This means that competence involves knowledge, and capability as well as disposition to solve challenges found in the domain. Individuals could be competent if there is a skill to solve challenges in that domain and also its appropriate deployment for solution. Importantly, individual personality is part of their linguistic competence. While it is reported that personal competence is one of those competencies that are extremely crucial to professional situation or life, the result is that, linguistic competence is one of the main themes in applied linguistics, and thereby usually being considered as one to also be applied to professional life. It could be said that no unified theory to date could be solely applied to account for competence in monolinguals (see Lehmann, 2007).

Meanwhile, different perspectives have been made to shed light about competence as a concept. Linguistic competence (LC) also known as *grammatical competence or I-language* refers to tacit language knowledge (which means a system involving pairing sounds and meaning or the language structure) that is believed to be present in people's (mind) or brain. In other words, LC contrasts with linguistic performance (LP), and Chomsky among other linguists have established that LC could not be used in an evaluative sense, but to suggest the innate language knowledge relating sounds to their meanings (see Nordquist, 2017). The innate linguistic knowledge in this case may be of a language or languages in case of being a

bi/multilingual. While explaining a fundamental distinction between LC and LP, Chomsky in *Aspects of the Theory of Syntax* (1965) suggested that the speaker-hearer's knowledge of a language could be termed *competence*, while the use of language in real situation could be seen as *performance*. Similarly, it could be said that LP is much concerned about processing of sentence using the knowledge of a language during expressive and receptive language activities.

In the same token, linguistic competence primarily involves the tacit and implicit knowledge of a language which suggests that people are without prior consciousness of the rules and principles governing the manipulation of words, sounds, and sentence combination; but get to detect whenever those rules and or principles are breached (Fernandez & Cairns, 2011). For instance, when one utters and certifies the ungrammaticality of this sentence: *Kemisola was made the nice gown themselves*, it is a result of tacit know-how about the grammatical rule that the auxiliary verb, *was* should be *has/ had*, and the reflexive pronoun (*themselves)* should be *herself* in order to point back (i.e., doing anaphoric reference) to *Kemisola* (the NP) in the sentence.

In the light of Noam Chomsky's theory, *linguistic competence* remains an unconscious language knowledge that is closer to de Saussure's *langue*, the concept that involves organising principles of a language. Furthermore, what is referred to as utterance is linguistic performance which is like Saussure's *parole*. Making a distinction between linguistic competence and linguistic performance can be further understood through slips of the tongue, which when made does not suggest lack of English knowledge but instead, making mistakes due to boredom, distraction, or whatever. Committing such mistakes does not also show one as neither a poor English speaker nor lacking the knowledge of the language as someone else does. Ultimately, it indicates that linguistic competence differs from linguistic performance. If someone is certified as a better speaker than someone else is, the judgment sheds light on performance, and not competence (Denham & Lobeck, 2010; de Saussure, 1986).

Additionally, when two language users could equally produce and recognise particular tasks, but due to exogenous differences (like short-term memory ability), they may differ in their capability to enforce it, and then the two could be said to be unequally linguistically competent in making use of their competence. One profound fact is that linguistic

competence needs to be identified and analysed in relation to personal internalised or inner 'programme' known for recognition and production. Though some linguists have linked the study of this programme to performance instead of competence, and it may be erroneous, as when attempting to use the programme the users intentionally become absentminded on whatever happens. This further raises the need for psycholinguistics to come with potent hypothesis on the programme structure (Kac, 1992). Meanwhile, doing that requires substantial input from neurolinguistics or understudying the biology of language as discussed in section 2.4.3.2 and 2.4.4.1 above.

2.5.3.2.2 On Linguistic Competence: The Debate, the Empirical Theory and the Reality

Linguistic competence from an empirical theory point of view implies the individual's capacity found in linguistic activities. Here, the linguistic capacity and the set of activities of the individuals are of note, and some historical accounts on linguistic competence have suggested various perspectives from which the subject could be considered, but not as a theory. First, the notion of de Saussure's *langue, langue* and *parole* has received diverse interpretations. While some authors regarded *langue* / *parole* (or both) as inter-individual linguistic elements, and not of individual space, de Saussure also claimed that *langue* is a jointure of *langue* and *parole*, and that the two are regarded as sides of the same coin owing the social and the individual part of *parole.* Furthermore, while de Saussure also explained that *langue* is located in a person's brain, Lehmann (2007, p.11) opined that "what is in the individual brain is not *langue* itself, but just an imperfect instantiation of it". Similarly, Roman Jacobson (1984) who was known as an ardent critic of de Saussure affirmed that using two independent yardsticks: *social* vs. *individual* and *virtual* vs. *actual* to differentiate *langue* and *parole* is not absolutely right because parole is in reality also social, based on the second yardstick, and therefore sensible to describe *langue* as an ability even if it needs further clarification on the basis of being virtual (Lehmann, 2007).

Importantly, the idea of *competence* versus *performance* has raised more debates after the release of Chomsky's (1965) *Aspects of the theory of syntax* than ever before as an in-depth distinction of both terms were made. According to Chomsky, primarily, linguistic theory focuses on an ideal speaker-listener, within a speech-community that is totally homogenous, and such speaker-listener is believed to be proficient in that language without grammatically-linked issues like distractions, reductions in memory, shifting of interest and attention

elsewhere, as well as errors (which may be random or characteristic) in employing one's language knowledge to perform in real life. The author maintained that a variety of factors need to be considered before one can study actual linguistic performance, and one of such factors is implicit competence of the speaker-hearer. In addition, the author distinguished between competence and performance (i.e., from knowledge of the speaker-hearer's language and the deployment of such language in real life situations). It is also mentioned that performance may not be a true reflector of competence or be directly linked to competence as there may be some deviations from rules, false starts, and changes to subject matter midway of natural speech. Importantly, determining the underlying system employs for actual performance from the data of performance remains a concern for the learner of a language as well as for the linguist (Chomsky, 1965 in Lehmann, 2007).

In addition, Chomsky's *Language and mind* (1968) indicates that the idea of competence received restricted description that the ideal (or idealised) speaker-hearer and the associated competence also involve phonetics and semantics strictly be in line with that language rules. This further reinforces that as model for ideal competence, a language and its grammar interconnects somewhat between phonetics and semantics (Chomsky, 1968).

In 1980, it was reported that Chomsky introduced other closer terms called *grammatical competence* and *pragmatic competence* which were explained in the following manner. Grammatical competence and pragmatic competence can be distinguished for exposition and enquiry; and the former is concerned with having form and meaning knowledge while the latter is pertained to knowledge of using the language for varied needs but it hinges on conditions and manner of making such use appropriate and conform to numerous purposes. Language can therefore be used as an instrument, and it is its grammar that have intrinsic features of the instrument as both semantic and visible structure of every sentence can be seen physically. The grammatical competence can therefore be expressed by grammar, which entails rules and principles that are systematically enshrined in the language but also establishing pragmatic competence, which relates how the tool has been or can be effectively employed (Chomsky, 1980 in Lehmann, 2007).

Based on the above excerpts, it is clear that Chomsky's claims further raised more questions on linguistic competence as his introductory work and later work on the subject were inconsistent and inapplicable in the real linguistic activities. For instance, *pragmatic*

competence was made with no role while the *grammatical competence* was substituted by *knowledge of language*—which is a *cognitive system* – a state of brain/ mind. Another claim was that the human mind contains "performance systems" which aside the human language faculty, "access this information and put it to use" (Chomsky, 2000, p. 90). While another conception attached much importance to differentiation between the capability to employ knowledge, and the knowledge itself, literature has raised several problems attached to such notion as well. First, the concept of *tacit knowledge* has some contradictory terms as seen in the above excerpt because knowledge is often used to imply the state of mind that someone cannot explicate or make explicit. In swift reaction, *cognize*, a neologism coined to nickname a kind of mental power people have in their indigenous language was used with emphasis that "*cognising* is tacit or implicit knowledge" (Chomsky, 1980, p. 69).

Second, literature has shown no empirical correlation for the construct of the perfect native speaker. Succinctly, the success of empirical science can be measured by the degree in which it offers "solutions to problems in that field of everyday experience, problems that it has not created itself. That presupposes a certain degree of correspondence between its constructs and some observable phenomena that matter to the social community" (Lehmann, 2007, p. 12). Based on the excerpts above, Chomsky's explanation of competence did not touch anything on the individual ability but instead touched the concept of structural linguistics in which sound and meaning and many other issues are associated as a system of language which was further linked to both psychological and neurological assimilation in which the ideal speaker hearer had imbibed. Accordingly, the concept could not be regarded as empirical theory as it entails different idealisations that cannot therefore be operationalised as claimed by Chomsky (Lehmann, 2007). Relatedly, Widdowson opined that as far as the indispensable nature of language (which is a social process) has been missed; it is therefore ontologically and heuristically invalid due to the impossibility to bring out de Saussure's system known as *homogeneity*, and also what Chomsky called well-defined neither from data of parole nor from whatever intuitions a member or representative of the speech community possess (Widdowson, 1973).

That also shed light that linguistics could not be reduced to the study of *langue*/competence. Furthermore, *linguistic competence* of typical developing individuals and of those with development disorders like classic autism and primary aphasia are dynamic. This is contrary to Chomsky's *linguistic competence* which is static as he explained. This corroborates the

idea that native-like competence is not only possible or solely develops in acquisition of L1 but throughout one's lifetime (see Taylor, 1988). Coseriu (1988) also added that during people's lifetime, people do enrich their linguistic competence as they attain varied levels of entire germane language components and degrees. An instance can be noticed in some monolinguals and some multilinguals who might have developed competence to a certain level but at the disadvantage of their indigenous language. This also goes the same way for the second language learners who may be neurologically fit or unfit: their languages develop, and to refute that dynamism nullifies the notion of competence as ineffective and not suitable for empirical theory in linguistics (see Lehmann, 2007).

Similarly, LC "is no more than the name for the non-reducible core of language – those aspects of language that form the autonomous purely linguistic system characterised by a formal grammar, it becomes clear that many things we 'know' about language do not fall under the generativist's competence as defined by Chomsky" (Okolo, 2008, p. 143). Furthermore, drawing distinction between competence and performance seems more debatable because it is difficult to assign rule or criterion for linguistic phenomenon in order to decide the aspect which belongs to competence or performance. Second, while a theory of performance is needed to explain almost non-marginal linguistic phenomena, it is unthinkable to say that any part of language usage could rest on only competence for its explanation, just as competence has been noticed to virtually contribute to all aspects of performance (Okolo, 2008). Lastly, another claim that stemmed from the use of competence as a fundamental idea of ability by some linguists such as Canale and Swain (1980), Taylor (1988) and Chomsky (1986), among others, have led to exclusion of *ability* from the defining terms of *competence* and linked closely to *knowledge* that was reportedly termed *cognising* by Chomsky. Meanwhile, "it has never been demonstrated that an ability is necessarily an ability to use a certain knowledge and that therefore the concept of ability presupposes the concept of knowledge" (Lehmann, 2007, p. 13), and as such made the concept of competence in the light not useful to be empirically correlated.

Unfortunately, some claims, especially Chomskyan's (on the notion of competence), could not be considered as considerably legitimate or empirical, because till today, no single theory can be applied to account for competence in both foreign language and native language; and this is also applicable to competence of a monolingual and plurilingual (Lehmann, 2007). Within the context of this study, the linguistic competence of the bilingual/ multilingual

autistic children can only be adequately studied based on their linguistic and communicative performance that are subsumed under socio-communication traits of ASD.

Due to some claims made against LP as shown above, Coseriu (1988) came up with what was considered a comprehensive theory of LP that mainly focused on speaking as well as understanding as against language system. This shares some features with Hymes' perspectives on LP. In that view, LP was explained at three levels: These are as follows:

i. General linguistic competence can be equated to elocutionary knowledge (that is, speaking in consonance with reason and world knowledge (Coseriu, 1988 in Lehmann, 2007).
ii. Language-specific competence is also equated to idiomatic knowledge (that is, control of units and operations of a particular language system).
iii. Discourse competence is equal to expressive knowledge (that is, the use of such units and operations tuned in with the linguistic and extra-linguistic context).

Similarly, a deeper explanation of components of linguistic and communicative competence is presented below.

2.5.3.3 Components of Linguistic and Communicative Competence

In an instance of reaction to Chomsky's (1965) notion of "linguistic competence", Dell Hymes in 1966 coined the term "communicative competence" which serves as intuitive functional knowledge and control of the principles of language usage. Hymes (1966, p. 227) pointed out that for a normal child, acquisition of knowledge of sentences in addition to grammar is normal as well as appropriate. Similarly, competence in terms of when to speak, and not to speak as well as who to talk to, about what, where, and how (manner) are all acquired by the child. In sum, it is logical to state that a normal child will achieve a repertoire of speech acts, and be active in speech events, and be able to assess whether others have accomplished the same or not.

In Hymes' (1971, p. 16) opinion, communicative competence can be linked to an act of speaking in whole. This implies having competence in grammar, pragmatics, and sociolinguistics. Additionally, based on linguistic competence, there is a need to employ the language correctly as well as appropriate based on communicative competence. Based on this

approach means that a language's grammatical rules are crucial towards accomplishing competence which Michael Canale and Merril Swain (1980) have theoretically postulated. The competences which are focused may entail probing into the linguistic, sociolinguistic, discourse (extended conversation or talking), and strategic competence.

1. **Linguistic Competence**: This is the knowledge of the language grammar, vocabulary, and also its conventional written representation (script and orthography), and in general, language code. In the grammar component, there is the following knowledge: phonetic (production of sounds); phonology (how sounds are manipulated and patterned through rules); morphology (words formation strategies); syntax (words combination rules for making sentences); and semantics (meaning-making strategy) (see Canale & Merrill, 1980).
2. **Sociolinguistic Competence**: This is based on socio-cultural rules of how to use and respond to language appropriately. What largely determines such appropriateness include the setting of the communication, the topic, and the relationships among the people communicating, as well as understanding the taboos of the other culture, their politeness indices in a particular situation, etc.
3. **Discourse Competence**: This could be described as expressive knowledge that operates with units of linguistic and extra-linguistic context. In other words, this knowledge helps to produce and comprehend oral or written texts in the modes of speaking/writing and listening/reading. With discourse competence, different types of texts would attain reasonable level of cohesiveness and coherence. Therefore, discourse competence involves organisation of words, phrases and sentences in order to create conversations, speeches, poetry, email messages, and newspaper articles, among others.
4. **Strategic Competence**: Strategic competence can be placed under sociolinguistic competence. It deals with "compensatory verbal and non-verbal communication strategies for second language learners especially (Lehmann, 2007, p. 14). To capture it in another way, this competence will help recognise and repair communication breakdown before, during, or after they occur. For instance, the speaker may not know a certain word, say in English, thus she/he will plan to either paraphrase, or ask what that word is in the target language, (isiZulu for instance). Beyond that, the strategies may be employed to request for repetition, clarification, slower speech, gestures, and turn-taking in a conversation etc.

2.5.3.4 Communicative Competence: Multiple Perspectives, Multiple Definitions, and Theoretical Models

Researching into communicative competence-related topics has been identified (often in the language testing literature) to require definite constructs to essentially arrive at a clear operationalisation of such construct. Since the 1960s, varied but crucial perspectives and definitions have been attempted to define and create communicative competence (CC) models. The word competence stands at the centre of the syntagm, and thus believed to be one of the most debatable terms in applied and general linguistics (Bagaric & Djigunovic, 2007). It was in the 1970s and 1980s that the concept started receiving controversies, and by then, valuable contributions were offered by several applied linguists whose main interest was either theory of language testing and / or language acquisition. Importantly, some of these linguists have added some empirical and theoretical bases to the concept of communicative competence. Bagaric and Djigunovic (2007) examined a number of definitions and models since 1960s, and concluded that first; the notion of communicative competence has been modified over time to suit a particular context, and thereby led to various terminologies (e.g., communicative language ability, language proficiency, communicative language competence etc.). Those terms seemed to be employed agreeably to mean that knowledge of language as well as ability and skill (needed to activate the knowledge) are combined for communication. It was later known that ability in this context required varied cognitive processes and factors such as affective use in language (Skehan, 1998), and therefore not easy to evaluate, understand, and describe unlike the knowledge of the language which can be simply described, assessed, and understood (Bagaric & Djigunovic, 2007).

2.5.3.4.1 Communicative Competence and the Bi/ multilingual Autistic Children

For the purpose of this study, *linguistic competence* cannot be an absolute yardstick to measure the authentic competence level /nature of the children with ASD who were raised or trained by bi/multilingual caregivers. Based on the deficits however, recorded in what is regarded as *linguistic competence*, language use will definitely incorporate some elements of what is known as *communicative competence* (CC). This term was coined and popularised by Dell Hymes in his 1971 and 1972 publications. Hymes maintained that Chomskyan grammatical competence (as described till then) was frail and insufficient to bring about relevant linguistic life needed by the individual. Hymes' CC considered speaking as complete activity that involves grammatical as well as sociolinguistic and pragmatic competence

(Hymes, 1971). As many scholars view linguistic competence a part of CC, Canale and Swain (1980) reiterated that communicative competence has the following components:

a. Grammatical components (that is language system).

b. Sociolinguistic competence, comprising:

i. the socio-cultural rules of use; that is, appropriateness;

ii. the rules of discourse; that is, cohesion and coherence of sets of utterances;

iii. the use of correct grammatical forms for varied communicative functions that can be applied in varied sociolinguistic contexts.

c. Strategic component; that is, both non-verbal and verbal communication strategies.

The (c) above caters for the second language learner, but the strategies mentioned may be found or executed under (a) or (b) as well (see Lehmann, 2007). The primary concern here is on the relevance and connection of CC to both linguistic and communicative activities of typical developing or atypical developing individuals.

Importantly, each component above can be judged relatively from different degrees of competence based on what Hymes (1971, p. 7; 1972, p. 274) called "differential competence". This was contrary to what Taylor (1988) claimed regarding Chomskyan competence. This offered an explanation on relativity of competence in one's native language and in second language. The relativity of LC is therefore relative to individual who owns it (Hymes, 1971, 1972). Similarly, relativity of LC involves the notion that competence has degrees, as one may be barely competent in one language and highly competent in another. When comparison is made further, competence in one's native language actually receives less attention unlike assessment of competence in foreign languages (Spitzberg, 1988). Lehmann (2007) also reported that objectively, comparison can be made between individual's further languages and in his/ her native language through an empirical idea of competence. Suffice it to say that from the above CC and LC are inextricably interwoven and CC actually develops from interacting with humans. The degree of competence also depends on who is being communicated with during various interactions (see Spitzberg, 1988), and for the autistics (of any age), the level of mastery of both linguistic and communicative component discussed above by the caregivers and educators is part of the essential factors that determine the degree of competence of the autistics.

2.5.3.4.2 Relativity and Cognitive Levels of Competence

Relativity of linguistic and communicative competence of the autistics is not unique as the non-autistics also experience variation in the level of their competence. The parameters for this variation and relativity of all linguistic components are tied to two cognitive levels that are known as procedural and *reflective*. The table below from Lehmann (2007, p. 17) gives a summary of what cognitive levels are required for the linguistic and communicative competence.

level	competence	faculty	content
lower	procedural	language ability	skills of speaking and understanding
higher	reflective	language knowledge	recursive reflection on language

Table 2.6 The procedural and reflective linguistic competence

As shown above, reflective linguistic competence involves the capability to use language to communicate, and in turn understand the world; and it contains how language is arranged using declarative knowledge; the function being played in the life of human beings, the manner and in what situations it works (Lehmann, 2007). This means that a procedural competence presupposes the ability of someone who can speak one dialect or foreign language besides his/ her native language, and having and using more information to describe how the dialect/ foreign language, and native language are different or similar presupposes the use of declarative knowledge. Both procedural and reflective procedural competence differ in speakers (Lehmann, 2007), and what is termed linguistics has also been regarded as" higher-level declarative knowledge of language" (Lehmann, 2007, p. 17). Similarly, the mode of communication can be directly linked to language ability of individuals, but based on the cognitive bases of communicating linguistically through the channels and directions (which may be passive, active or both) and through speech participant's usage. These activities are captured by Lehmann (2007, p. 18) and presented below.

channel / direction	oral	written
production	speaking	writing
reception	listening	reading
mediation	interpreting	translating

Table 2.7 Modes of linguistic communication

The difference among the four / six modes underlying competency or proficiency in both L1 and L2 is not methodologically or theoretically weighty. From the theoretical perspectives, those communication modes (based on channel or direction criterion) found at the ebb of concepts are used to describe the low realm of the conceptual phase of *linguistic competence*, and thereby have the following features:

i. They are aspects only of procedural, not of reflective competence.
ii. They only concern the communicative, not the cognitive side of linguistic competence.
iii. And even for the communicative side, they are relatively peripheral to the extent that they are more based on the technical aspect of channel and direction than on the social nature of communication (Lehmann, 2007, p. 18).

Meanwhile, the methodological aspect concerns testing the receptive competence and the case of its validity. The bases of this may be linked to valid assessment of productive or expressive aspect of mediation in which assessment may be directly conducted, but this may be impossible for the perceptual part because some tests necessitate response to show what the tester knows or not (Lehmann, 2007). Importantly, the receptive and expressive language skills or competence in ASD have received much attention, and it is crucial to determine and evaluate the degree and relativity of both linguistic and communicative competence of the autistics. This issue is discussed in another section.

2.5.3.5.3 Fluency, Cognition, and Competence

In terms of competence (linguistic and communicative), fluency may be considered as a component that is controlled by certain cognitive domains and which can be assessed. This implies using

> the rate of relevant units per time unit and the evenness of this rate over a longer stretch or in terms of the (low) number of hesitations. The concept of fluency by itself does not imply correctness. Since anybody may achieve higher fluency in an activity by lowering the standards of correctness, values of fluency become comparable only if the measure has been calibrated against a correctness value to be stipulated (Lehmann, 2007, p. 19).

The relevance of this to the present study is enormous, because fluency requires reasonable level of automatisation. Similarly, assessment of fluency is like evaluating *procedural competence* (Fillmore, 1979). By that saying, fluency can be categorically listed as a form of competence, and also an aspect of both language-specific competence and universal semiotic competence. Lehmann (2007) further reiterated that one may command fluency in a particular language but which may vary from fluency of the language he/ she knows, and thus makes fluency an ability that is language specific. In another view, one's fluency may be influenced (i.e., limited or dictated) due to his/her ability of universal semiotics. In relation to ASD, it is possible to find a few verbal individuals with ASD to even have a varied fluency in performing their communicative and cognitive operations in general. As shown below, language specific ability could also presuppose one's knowledge of language as exemplified in section 2.5.3.3.1.

2.5.3.5.4 Nexus between Language Ability and Language Knowledge

This concept is essential for the study and understanding of socio-communication in ASD because even in the typically developing individuals. The presence of little automatisation will mean difficult deliberations as well as huge efforts in utterance formations while having more than enough will mean failure to achieve cognitive and communicative objectives due to idling (Lehmann, 2007). The author also mentioned that in processing language, the neural substrate of elocutionary competence may be taken as equilibrium existing between sub-consciousness as well as consciousness. With the above, watching out for or monitoring the mode of automatisation of the autistic individual may aid bids to advance their language knowledge and language ability.

Based on the above explications, it should also be remembered that having the procedural competence does not guarantee having the reflective competence as individuals may have the former in an activity and not in the latter. In relevance to this study, an autistic may know how to routinely perform greetings with few utterances but unable to write it down (see modes of linguistic communications in section 2.5.3.5.2 above). This means even a professional linguist may be unable to speak a language but still have enough information about the language while the indigenous speakers with procedural competence in the same language may have no linguistic knowledge altogether. The linguist's knowledge of the language could not at the same time be called "competence in a language", "language ability", "proficiency in a language", or "mastery of a language" as the basis and core of language competence lies in procedural competence—that is, the skill (Lehmann, 2007, p. 19).

Furthermore, any claim put forward that linguistic competence is devoid of procedural and ability is not followed here as more evidence has shown that the relationship between language ability and language knowledge are equally dynamic. Specifically, procedural competence is much concerned about language acquisition which is first acquired. Intellectual capacity also plays a role during the child's linguistic activity through linguistic knowledge that exerts control of both conscious and subconscious modes. Furthermore, it is through the formal education that the higher point of linguistic knowledge is usually achieved, and by so doing, the procedural competence is dominated secondarily by its counterpart, reflective competence. In case of the absence of formal education, linguistic competence will rely on the procedural competence, but this will be without meta-linguistic reflection; "it also entails narrower limits on the operations of selection and combination that are constitutive of any language activity" (Frentz, 1996; Lehmann, 2007, p. 20).

When talking about acquisition of any second language (especially the one that is guided or learned through teaching), the above process becomes a reverse—meaning that—the learner at reflective competence level first acquires minute of that language in question, but not implying that he can communicate using the language. To achieve a communication level in that language will require automatisation of his /her knowledge by practising, and for those who may not practise the taught language, they remain on the reflective competence as long as possible, and this is where being fluent or not comes in again (Lehmann, 2007). In the light of the above, it is clear that the notion of linguistic competence being one-sided can be

entertained once a while because the notion of reflective competence is not always immaterial in the language as many language tests for instance concentrate on assessing reflective competence particularly grammar knowledge. Based on that, it is possible to have individuals with incomplete linguistic development, and they could not be certified as fully competent in the language under focus. Lehmann (2007, p. 20) stated two results that the above may lead to. They are:

i. A holistic notion of linguistic competence must not be reduced to either language ability or to knowledge of language, but must comprise both.
ii. Any analysis of an individual's linguistic competence must distinguish systematically those two aspects.

The above submissions are essential for the study of socio-communication aspect of the bi/multilingual children with autism as well. Firstly, the nature of communicative competence in both L1 (which is largely isiZulu in this study) differs from that of L2 (which is largely English), and the former may be influenced by the absence or too little automatisation thereby requiring great effort to make utterances. The activation of neural substrate of elocutionary competence may not be there at all or done unequally during conscious and subconscious language processing time. This will negatively affect them to achieve both their cognitive and communicative goals. Secondly, competence in L2 of the subjects is predetermined and influenced by the nature of their brain functionality or ToM (this will be explained later under theoretical underpinning of this study), but also essentially, the linguistic competence (i.e., both procedural and reflective competence) of subjects' educators, the parents/ other caregivers (who they spend more time with) has a great deal in their overall linguistic knowledge, and linguistic ability.

2.5.3.5.5 Linguistic competence levels of generality

Though the above different ideas on linguistic competence are invaluable, on the other premise (i.e., the one concerning the value of apparent purpose, structure and function of linguistic competence), the level of *universal semiotic competence*, and *language specific competence* level were claimed to presuppose the generality of linguistic competence system. The table below, according to Lehmann (2007, p. 21), presents their comparison.

competence level	universal semiotic	language-specific
defined as	ability to think and communicate by some semiotic system	mastery of a particular language, including its system
based on	language faculty	socialization
how possessed	mainly innate, partly acquired	acquired
distinguishes	man from animal	speakers of different languages

Table 2.8 Linguistic competence levels of generality

To start with, the two levels of competence above can be differentiated in any human being, and to individuals, they are also relative—meaning their language faculties are varied just as humans differ in some genetic composition. The classification of linguistic activity at these levels also varied generally; therefore, it could be said that for any language-specific competence, the universal semiotic competence is the cornerstone. The following explanations describe the phenomenon better. From functional viewpoint, someone's linguistic competence can be measured in terms of his/her complete semiotic competence as highest-level of questionings in assessing one's linguistic competence. Determining this requires asking for both communicative and cognitive difficulties he/she can solve using any method or tool; and the question at the bottom of teleonomic hierarchy is the extent or quality of this person's competence in either his/her L1, L2, or L3 (Lehmann, 2007).

The above provides the background of how *semiotic competence* may entail both universal semiotic competence and *language-specific competence.*

a. **Universal semiotic competence:** Making sense from symbols or object is also a linguistic activity, and this requires both *mental and physiological processing*. While the physiological aspect involves personality-based items such as skills, talents, and behaviour that has features of fluency and clarity, the fundamental aspect of physiological equipment is mode-dependent that involves organisation of neurons (discussed in section 2.4.1) located at the cortex, which has to do with some categories of working memory, short-term and long-term memory (see Daneman & Carpenter, 1980). Further sub-categorisation, according to Lehmann (2007, p. 21), will mean that the physiological side of the *universal semiotic competence* has to do with those modes mentioned in section 2.4.4.5. These sub-divisions are:

i. Production:

- This requires one to be speaking without defects such as mumbling, stuttering, and lisping, and also with accurate pronunciation, all done in a speed within tolerance limits, etc.
- Legible and orderly writing, among others.

ii. Reception:

- Activating high auditory differentiation for understanding a phenomenon through perceptual and attentive listening schemes etc.
- Accelerated reading that is coupled with accurate understanding, among others.

On the other hand, the mental aspect of *universal semiotic competence* means relating it to *elocutionary competence* as described by Coseriu (1988). This term is necessary as communicative competence—the same commonly used term tends to be driving more towards social aspects of competence, and side-lining the cognitive aspect. Meanwhile, the mental abilities which underlie *elocutionary competence* have both social and cognitive attributes. According to Lehmann (2007, p. 22), *cognitive competence* therefore involves the following aspects:

- reasoning: learning from experience, adaptation to one's environment, control of different cognitive domains, drawing inferences by relying on world knowledge; language-reflective ('meta-linguistic') competence, language-awareness;
- coherence and cohesion of thinking and of the discourse manifesting it;
- creativity, musicality.

The *social competence* involves capabilities such as these mentioned below:

- empathy, making contact, successful social interaction;
- control of different communicative domains, rhetoric competence: adequacy to (linguistic) context and (extra-linguistic) situation;
- control of conversational maxims.

The above under *language-specific competence* are capacities which an individual have, and incorporated. The extent at which individuals may achieve the above is also based on other personal factors. Importantly, as related to this (linguistic) study, social competence is an essential element of communicative competence, and both can be differentiated at some levels bearing in mind that the core functions of language are communication and cognition. With that, a cover term *communicative competence* is neither taken here for *linguistic*

competence nor at conceptual level (unlike what Hymes, 1972, as well as his followers reiterated), and at *universal semiotic competence* level (unlike what Grosjean, 1989 believed) (see Lehmann, 2007).

b. Language-specific competence

As explained above, the same capacities of individuals also relative to individuals, and this is the same concerning the *language specific competence*, but this may be predicated on the conventions of this language and its associated culture. The linguistic nature of these capacities cannot be disputed as they are language-specific. This suggests that the overall universal linguistic competent of a monolingual is determined in that particular language, while to the bi/multilingual person, two separate levels are to be watched out for. In the first place, the achievements in L1 and L2 have some correlation as, "neither can be better than what his language faculty (and its extra-linguistic bases) predisposes him for. In this sense, his universal linguistic competence comprises what is common to the set of competencies in the various languages that he possesses" (Lehmann, 2007, p. 23; Hulstijn & Bossers, 1992). Similarly, Cook (1992) explained that the proficiency level of L2 in education situations would be as a result of the level of proficiency in L1. For the multilingual person in the second place, the goals are usually different in different languages and thereby making his/ her universal linguistic competence to involve a combination of cognitive goals and communication goals in which he/ she can attain in his /her language (see Lehmann, 2007).

Meanwhile, language-specific competence (in Sasaki, 1996, p. 7 has "organisational" and "pragmatic competence" subcategory but similar to what Lehmann (2007) called "language-system" and "variational competence") cuts across three dimensions which according to Lehmann (2007, p. 24) are:

i. *Language system competence* that involves these items:

a. phonetics and phonology comprise orthophony and orthography;
b. grammar comprises morphology and syntax;
c. lexicon comprises vocabulary, lexical relations, word formation/neology;
d. discourse comprises language-specific norms of text structure.

It should be noted that in Canale and Swain (1980, p. 29), language system (in i above) was referred to as "grammatical competence", while Coseriu (1988) referred to it as "idiomatic

competence" (Lehmann, 2007, p. 23). The last item above the discourse was also named "discourse competence" in Canale and Swain (1980, p. 29).

ii. *Pragmatic competence* is about the capability to employ language in varied social contexts. Its subcategory however suggests it belongs to several functional domains.
iii. *Variational competence* involves understanding and mastering (through different dimensions) the norm and linguistic variation, and being able to maintain flexibility in varied aspects of linguistic tasks such as:
a. sociolectal,
b. dialectal,
c. diaphasic: oral and written language, styles and registers (appropriateness, euphony etc.).

One notable point (though no theoretical explanation is attempted here) about *variational competence* is what Canale and Swain (1980) called sociolinguistic competence; it involves a systemisation in which a multilingual person's competencies are viewed as language-specific. It is believed that a person's *variational competence* is a bundle of competencies, or the composite competence of a multilingual person, as described by Grosjean (1989) and Cook (1992), is what makes part of the person's *variational competence.* As a matter of necessity, linguistic competence can be summed-up using the following yardsticks as presented by Lehamann (2007, p. 25):

I. *At cognitive levels* the following are very important:
1) Language ability which involves:
a) *Modes of communication*
b) *Fluency*
2) Language knowledge
II. At the levels of generality and components, the following are involved:
1) Universal semiotic competence which includes:
a) Physiological ability, and
b) *Elocutionary competence*. This is further sub-divided into:
i) *Cognitive competence*, and
ii) *Social competence*
2) At the level of language-specific competence, the following competencies are involved:
a) *Language system competence*

b) *Pragmatic competence*

c) *Variational competence*

The classifications under I and II are cross-subdivided with each other and it can be said that in II, all levels and aspects of *linguistic competence* distinguished necessitate both *procedural* and *reflective competence*. The classification was made on the basis of current, relevant linguistic theories. Notwithstanding, different speech communities and the general populace may consider competence from different perspectives, and as such, the subsets of those skills, knowledge and capacities shown above may be measured differently in those speech communities and by those people (Lehmann, 2007).

2.5.3.6 Measuring Linguistic Competencies of Bi/ multilingual children with ASD

The exploration of various competencies in previous sections has revealed that the autistics will benefit tremendously from both empirical and theoretical explanations relevant to their competency level which has dimensions in terms of its evaluation. First, the universal *semiotic competence* might be tested differently from the subjects' language-specific competence (see Lehmann, 2007), and for the autistics, both are necessary because of possible disruption in their brain system, and deficit or absence of ToM, and stereotypical behaviour associated with the subjects. In corroborating the above view, Grosjean (1989) established that for a bilingual *universal semiotic competence* (regarded as communicative competence) to be justified, the union of his/ her set of competencies (i.e., language–specific competence, and universal semiotic competence) should be considered. In relation to the above, the nature of competence that the bi/ multilingual autistic children have in their non-native languages (primarily isiZulu here) must be compared to a monolingual's competence of the same language (Lehmann, 2007), but the comparison here necessitates the nature of competence of the bilingual or multilingual non-autistic children of the same L1, L2, or/ and L3 (isiZulu, English and any other language).

Furthermore, native competence has been a yardstick for evaluating proficiency of learners' second language, but it should be noted that the degree of native speakers' proficiency is also varied. This implies that the above measure is not standard, and in reality, the same criteria such as (language ability, language knowledge, expressive and receptive skills, and ability to reflect on language) need to be used to assess the same native speaker's competence

(Lehmann, 2007). Doing language-*specific evaluation* and *universal semiotic competence* will require taking the value reached by the subjects (the bi/ multilingual autistic children here) and be compared with the norm. Both value and the norm of children with ASD and the non-autistic children may be slightly or significantly different based on certain factors such as psychological and neurocognitive components the individual subject possesses. Importantly, the linguistic competence has a defined number of objects, and they include a number of lexical items, a number of sociolects as well as a set of constructions (Lehmann, 2007). Furthermore, the author explicated that measurement of competence is possible in these contexts of sets but based on the number of pertinent objects known by the person. Alternately, according to this author, limited time is needed to solve certain tasks in order to have difficult items processed and measured in their unit.

Whether in typically developing children or in those with neuro-developmental disorder like autism, testing competence lexical items of a language for instance will involve tasks on listening, writing, speaking and writing (that is, the four modes mentioned in the previous section), which are done at both reflective and procedural levels but with various possible variations. Several hours may be required (but in case of the autistic children, it may be several days), and as a result, multiple tasks that require more than one ability may be set at a time. Secondly, each of the systematic aspects must be found in not lesser than one task without necessarily ensuring that every other aspect is cross-classified (Lehmann, 2007). In the light of the above, the language-specific and universal semiotic competencies of the bi/ multilingual autistic children can be undertaken. As part of the research design used in the study, the observation of autistic children's linguistic and communicative competencies (within academic setting in this context) was based on Hymes (1971) and (1972) as well as Canale and Swain (1980).

2.6. Receptive and Expressive Aspects of Linguistic and Communicative Competence of Bi/multilingual Autistic Children

This section discusses the nature of receptive and expressive language ability of children with ASD who may be bi/multilingual. These language abilities are peculiar to those who are verbal among these children.

2.6.1 The Experimental Norm of Language and Communication of Autistic Children

It is common to see some autistic children or people having difficulty in their linguistic and communication processing as a result of having language impairment which is one of the primary traits of the autistic syndrome. The nature of language in autistic syndrome has been investigated over two decades with many findings. They included descriptive studies (e.g., Pronovost, Wakstein & Wakstein, 1966; Wolf & Chess, 1965) which added support for the core clinical characteristics of language in autism, involving abnormal usage of prosody; delayed and immediate echolalia or imitation; metaphorical language (cf. Kanner, 1946); reversing the pronominal; and non-communicative speech. Recently, some empirical studies investigated within psycholinguistics have aimed at identifying aspects of language impairment which are cardinal to the deficit in autism (Tager-Flusberg, 1990).

Autism is said to exhibit primary impairment in either phonology or syntax (see Bartolucci & Pierce, 1977; Bartolucci, Pierce, Streiner & Eppel, 1976; Boucher, 1976; Cantwell, Baker & Rutter, 1978; Pierce & Bartolucci, 1977). This differs a bit from major deficits noticeable in the pragmatic aspects of language use, both in the range of functions that autistic children express (see Ball, 1978; Mermelstein, 1983; Wetherby & Prutting, 1984) and in their ability to communicate in a discourse setting (see Curcio & Paccia, 1987; Paul & Cohen, 1984; Tager-Flusberg, 1982 in Tager-Flusberg, 1990).

While some of those findings are still valid, some have been negated with new research evidence. For instance, there is a lack of data concerning language acquisition developmental forms in autistic children as well as the mode of possible language change over a period. Numerous studies have further shown that language samples are collected from researchers' laboratory experiments, and teachers' interactions with autistic children in school environment. The above scenario is in contradiction with present research in psycholinguistics because developing children may normally have robust language samples at home while interacting with their mothers/ parents (Tager-Flusberg, 1990).

Gernsbacher, Morson and Grace (2016, p. 414) also maintained that many linguistic abnormalities and communicative skills lag such as echolalia, attributed to autistic children are mostly not unique to them as non-autistic children also manifest such problems, and as research move on, they disappear. According to them, the earliest criteria meant for

diagnosing Infantile Autism according to DSM-III entailed that language development must be grossly in deficit. Also, it meant that in the presence of speech, both or either delayed or instant echolalia (which implies repeating what one has uttered), reversing pronoun or using pronoun 'you' in place of 'I' (also known as pronominal reversal), and metaphorical language are common speech patterns (APA, 1980). After 7 years, the criteria for diagnosis were revised as Autism Disorder (DSM-III-R, APA, 1987), and then both earliest common features of the disorder like echolalia and pronominal reversal became optional among a list of possible criteria while metaphorical language which had served as a criterion was also reduced to language idiosyncrasy.

Furthermore, when the criteria for diagnosing Autistic Disorder was reviewed (i.e., DSM-IV, APA 2000; DSM-IV-TR, APA, 2004), it reported the complete disappearance of echolalia and pronoun reversal, but the presence of "stereotyped and repetitive use of language or idiosyncratic language" existed. Another report from the most recent diagnostic yardstick for ASD known as DSM-5, relegated echolalia and idiosyncratic phrases as a communication deficit but marked it as one of various "restricted, repetitive patterns of behaviours, interests, or activities," all along with "lining up toys or flipping objects." Importantly, what remains absent from the most current diagnostic criteria is pronoun reversal while delay in language development is not mentioned (APA, 2013; Gernsbacher, Morson & Garce, 2016).

Generally, people use language (written, spoken, sign, gestural etc.) to communicate. Language is a tool for communication and fundamental to individual diagnosis done for communication disorders (Botting & Conti-Ramsden, 2003). Similarly, communication entails meaning constructed by two or more interacting partners through tone of voice, facial expression, gaze, gestures (non-symbolic), physical proximity, and other numerous paralinguistic modulation (including intonation) purposely for adding linguistic meanings, and for transmitting emotional tone that relate to the message, or in order to avoid verbal symbols while communicating. It is possible that children with autism possess varied level of problem in a bid to acquire speech and language; however, a core characteristic of ASD diagnosis is social communication (Prelock & Nelson, 2012).

Notably, it is clear that complex communication channels/ modes, coupled with certain linguistic difficulty, increases the chances of children with ASD to manifest certain communication deficits such as deficient in some social contexts and the deployment of

language to communicate efficiently (Tager-Flusberg, 1999). Meawhile, communication competence of person with ASD should be seen as partly psycholinguistic (a branch of cognitive science) and partly sociolinguistic (a branch of linguistics dealing with language and the society). While the psycholinguistic aspect of this case involves interplay of fields such as Psychology, Linguistics, Neuroscience, Anthropology, and Computer science; the sociolinguistic aspect involves phenomena such as: bilingualism, multilingualism, language and identity, linguistic situations classification, language engineering, national and standard languages and their social roles etc. Relatedly, Paul and Cohen (1982) stated that communication involves a broad coordination of group of systems from the cognitive, perceptual, and social functioning of human beings.

Again, in psycholinguistics, three primary processes are investigated. These are *Language Production, Language Comprehension*, and *Language Acquisition*. However, language loss as seen in aphasia has been included as another area of investigation in psycholinguistics (Chomsky, 1986). All these are usually explored when it comes to research the aetiology, comorbidity, diagnoses etc. of any neurodevelopmental disorder in which ASD is one. Some notable issues that revolve language acquisition, comprehension, and acquisition are discussed below in the light of ASD.

2.6.2 The Nature of Receptive, Expressive Language Development among the Children with ASD

Impairment in the language use in form of receptive and expressive language modes is fairly unique but not found across the ASD population (Bishop, 2010; Kjelgaard & TagerFlusberg, 2001), and in communication for social purposes are features that have been used to describe ASD (American Psychiatric Association, 1994). In a study by Loucas et al., it was established "that roughly 57% of their sample of children with ASD and normal non-verbal intelligence had language impairments" (Kwok et al., 2015, p. 200). Interestingly, several studies on ASD have documented diverse findings on receptive and expressive language abilities and their nexus with one another (Kjelgaard & Tager-Flusberg, 2001). Many clinical accounts have affirmed that competency in expressive language outweighs one in receptive language, and these reports are commonly employed to mark the atypical language profile of autistic children. Furthermore, in scientific literature, such characteristic has been reported to be a hallmark of ASD (Cohen & Volkmar, 1997; Hudry et al., 2010; Mitchell, Oram Cardy & Zwaigenbaum, 2011; Volden et al., 2011), and going by that account will mean that the

diagnosis of ASD will be differently related to developmental disorders (Cohen & Volkmar, 1997; Mitchell et al., 2011). Similarly, it implies that language development and impairment may follow "a unique trajectory in ASD relative to other disorders, and motivates unique intervention targets and approaches for this population" (Hudry et al., 2010; in Kwok et al., 2015, p. 203).

A number of studies have indicated impairment in receptive language of the autistic individuals with almost uniform claims that expressive language is better than receptive language in children with ASD. Contrary to the above, some studies have established that no discrepancy exists between the two, while some studies reported that the case of gaps in expressive and reflective language may be as a result of language measurement employed (Kwok et al., 2015). Kwok et al. (2015, p. 203) explained some instances of varied choices and their core results.

The receptive and expressive parts of the *Vineland Adaptive Behaviour Scales* (VABS) by Sparrow, Balla and Cicchetti (1984) have been employed by Weismer et al. (2010). Also adopted is *Sequenced Inventory of Communication Development* (SICD) by Hedrick, Prather & Tobin (1984). Furthermore, they have also administered the *Mullen Scales of Early Learning* (MSEL) by Mullen (1995) to children with ASD who belong to the same group. It was revealed that the performances on the *SICD* and *MSEL* indicated an advantage of expressive language unlike the *VABS* scores which implied the alternate pattern. A similar pattern was found by Luyster, Kadlec, Carter and Tager-Flusberg (2008) and these authors reported that the expressive language skill of children with ASD were stronger than their receptive skills based on the measurement done through the *MSEL* and the *MacArthur-Bates Communicative Development Inventory* (MCDI) (Fenson et al., 1992) but the result was opposite of what was obtained through the use of *VABS*. The findings on these studies altogether indicated that the advantage attached to expressive language is possibly linked to the language data source. Based on clinician measurement directly done on a child's language capability using the *MSEL,* the advantage of expressive language was noticeable in both studies. Conversely, based on the report given by caregiver, the result measured through *VABS* implied the advantage of a receptive language. According to what Luyster et al. (2008) found, this account is not satisfactory enough because using a report by second caregiver and measured in *MCDI* may lead to expressive advantage.

For vivid understanding, Table 3 below is presented to establish the sample of studies that have compared the nature of receptive and expressive language in ASD.

Author, Year	ASD Diagnosis	Age of ASD participants (years)	Receptive language measure	Expressive language measure
More advanced expressive than receptive language				
Kover et al., 2013	ADOS-G and ADI-R	4–11	PPVT-III	EVT
Volden et al., 2011	ADOS-G and ADI-R	2–4.92	PLS-IV	PLS-IV
Maljaars et al., 2012	DSM-IV-TR	3.3–11.3	Reynell/Dutch-CDI	Schlichting/Dutch-CDI
Weismer, Lord, & Esler, 2010	ADOS-G and ADI-R	2–3	MSEL (1989 or 1995), SICD	MSEL (1989 or 1995), SICD
Hudry et al., 2010	ADOS-G only	2–4.9	PLS-3-UK, VABS-II, CDI (Vocabulary)	PLS-3-UK, VABS-II, CDI (Vocabulary)
Luyster et al., 2008	ADOS-G and ADI-R	1.5–2.75	MSEL, CDI (Vocabulary)	MSEL, CDI (Vocabulary)
Luyster, Lopez, & Lord, 2007	ADI-R (Toddler) only	~2.5 (range not available)	CDI (vocabulary)	CDI (Vocabulary)
Charman, Drew, Baird, & Baird, 2003	ICD-10	1.5–7.33	CDI-Infant form	CDI-Infant form
Kjelgaard & Tager-Flusberg, 2001	ADOS-G and ADI-R	4–14	CELF (preschool or III)	CELF (preschool or III)
More advanced receptive than expressive language				
Luyster et al., 2008	ADOS-G and ADI-R	1.5–2.75	VABS	VABS
Weismer et al., 2010	ADOS-G and ADI-R	2–3	VABS/VABS-II	VABS/VABS-II
Equivalent receptive and expressive language level				
Loucas et al.	ADOS-G and ADI-R	9–14	BPVS	CELF-III-UK
Kjelgaard & Tager-Flusberg, 2001	ADOS-G and ADI-R	4–14	PPVT-III	EVT
Jarrold et al., 1997	DSM-IV	5.5–19.6	BPVS, TROG	WFT, APTG

Note. ADOS-G = Autism Diagnostic Observation Schedule-Generic; ADI-R = Autism Diagnostic Interview-Revised; DSM = Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1994); ICD = International Classification of Diseases (World Health Organisation (WHO), 1993); PPVT = Peabody Picture Vocabulary Test, EVT = Expressive Vocabulary Test, PLS = Preschool Language Scale, Reynell = Reynell Developmental Language Scales (Reynell & Gruber, 1990); CDI= MacArthur-Bates Communicative Development Inventory (Fenson et al., 1992); Schlichting = Schlichting Test for Dutch language production (Schlichting, Van Eldik, Lutje Spelberg, Van der Meulen, & Van der Meulen, 1995); MSEL = Mullen Scales of Early Learning; SICD = Sequenced Inventory of Communication Development; VABS = Vineland Adaptive Behavior Scales; CELF = Clinical Evaluation of Language Fundamentals (CELF-III: Semel, Wiig, & Secord, 1995; CELF-III-UK: Semel, Wiig, & Secord, 2000; CELF-P: Wiig, Secord, & Semel, 1992); BPVS = British Picture Vocabulary Scale (Dunn, Dunn, Whetton, & Burley, 1997); TROG = Test for Reception of Grammar (Bishop, 1983); WFT = Renfrew Word Finding Vocabulary Test (Renfrew, 2010); APTG = Action Picture Test Grammar Scale (Renfrew, 1988).

Table 3. Previous studies on comparison of receptive and expressive language status in ASD (Kwok et al. (2015)

Moreover, the choice of language was not believed to be enough reason for many inconsistencies as different patterns of receptive and expressive language in children with ASD despite using the same measures. For instance, in a bid to compare the participants' (individuals aged 4-11 and 4-14 with ASD but were diagnosed with *Autism Diagnostic Observation Schedule-Generic* (*ADOS-G*, Lord, Rutter DiLavore & Risi, 1999) and *Autism Diagnostic Interview-Revisited (ADI*, Rutter, Le Couteur & Lord, 2003) expressive and receptive vocabulary skills respectively; the *Peabody Picture Vocabulary Test–III* (PPVT-III) (Dunn & Dunn, 2007), and *Expressive Vocabulary Test* (*EVT)* (Williams, 1997) were both used by Kover, McDuffie, Hagerman and Abbeduto (2013), and Kjelgaard and Tager-Flusberg (2001). While Kjelgaard and Tager-Flusberg found no difference in scores of *EVT* and *PPVT-III*, Kover et al. discovered that *PPVT-III* scores were less strong than *EVT* in their sample (see Kwok et al., 2015).

Furthermore, the inconsistent reports across studies concerning receptive and expressive language in ASD might also be a result of age differences of the participants of the studies. While a few studies in this regard focused on adolescents and school-age children with ASD, some also focused on pre-school children or toddlers with ASD. The studies with younger participants tended to report expressive advantage over the receptive one. This suggested that several studies did not include adolescents and older children, and thus made it difficult to vehemently state that the expressive language skill is often found among the children with ASD. Another factor that has resulted in inconsistencies of receptive versus expressive language in ASD is their sub-domains.

Those explanations above cannot also be fully substantiated as only few studies have reported it. In view of the above, a huge body of literature has shown that many studies administered questions or examined both receptive and executive language skills (though the goals of these studies are not primarily about receptive and expressive language skills), but they have not found discrepancies in individuals with ASD in relation to their receptive and expressive skills. Importantly, Kwok et al. (2015) undertook meta-analyses review of 74 studies on this subject-matter using four predictors, namely, source of language data, language domain, method used for the diagnosis of ASD, and age of the participants. The reports accounted for no difference between the expressive language performances in children with ASD and their receptive language skill. Though some children with ASD may display better expressive skills over receptive, in general, both autistic youth and children displayed "equally impaired receptive and expressive language skills, both falling roughly 1.5 SD below peers with typical development" (Kwok, 2015, p. 202).

Similar to the above is a review conducted recently on various empirical studies that focused on language development of the autistics (in the 21st Century) by Gernsbacher, Morson and Grace (2015). The review indicated that research has reported diverse views on the nature of expressive and receptive language skills of the autistic children but the most consistent ones explained the delays in expressive language as found in autistics' first words (Charman et al., 2003; Matson et al., 2010), first phrases-like *my cat* (see Grandgeorge et al., 2009; Kenworthy et al., 2012; Pry et al., 2001), and grammatical sentences/ statements like *see me* (see Anderson et al., 2007; Wodka et al., 2013). In another set of studies, it has been stated that compared to the typically developing children (with the same age), the autistics have less

vocabulary in their expressive language (see Charman et al., 2003; Fulton & D'Entremont, 2013; Kover et al., 2013; Luyster et al., 2007; Luyster et al., 2008; Miniscalco et al., 2012; Sandercock, 2013; Stone & Yoder, 2001). In affirmation, Baird et al. (2003) and Filipek et al. (1999) expressed that the fewer vocabulary cases of the autistics and the delays in the autistics' expressive language (in words and phrases) can be reasonably considered as red flags for ASD, just as many parents of the autistic children seek diagnostic assessment based on the same case (see Agin, 2004; Gernsbacher, Morson & Grace, 2015).

In the meantime, Gernsbacher et al. (2015), based on their review, reported difficulty in arriving at accurate measurements for autistics' receptive language either with the use of *MacArthur-Bates Communicative Development Inventory* (as in the studies of Charman et al., 2003; Fulton & D'Entremont, 2013; Luyster et al., 2007; Luyster et al., 2008; Maljaars et al., 2012; Miniscalco et al., 2012; Paul et al., 2007, 2008; Vanvuchelen et al., 2011), and those assumed to be more accurate such as the *Reynell Language Development scale* (RLDS) used by Reynell and Gruber (1990), Miniscalco et al. (2012), Vanvuchelen et al. (2011); the *Peabody Picture Vocabulary Test or British Picture Vocabulary Scale* (PPVT) employed by Dunn and Dunn (1997), BPVS: Dunn et al. (1997), Grigorenko et al. (2002), Howlin (2003), Kover et al. (2013); the *Clinical Evaluations of Language Fundamentals* (CELF) found in the studies of Semel, Wiig and Secord (1992; 1995; 2000; 2006), Aman et al. (2004), Sigman and McGovern (2005), Wisdom et al. (2007); *the Mullen Scale of Early Learning* (MSEL) used by Mullen (1995), Luyster et al. (2008), Sutera et al. (2007), Swensen et al. (2007); the *Preschool Language Scale* (PLS) found in the studies of Zimmerman et al. (1992, 2002), Hudry et al. (2010), Jasmin et al. (2009), Walton and Ingersoll (2013), or *the Psychoeducational Profile-3* (PEP-3) employed by Schopler et al. (2005), Fulton and D'Entremont (2013). Though all of them reported delays in the receptive language of the children with autism, many others maintained that no difference was found between the language development of autistics and non-autistics (Goodwin et al., 2012), the number of words the former understand (Åsberg, 2010; Henderson et al., 2011; Paul et al., 2005), and the overall standard and length or number of written words, and sentence complexity (Troyb, 2011).

Many recent studies have however indicated that both receptive and expressive language are delayed in the language of children with ASD, but that discovery is not universal as more studies have discovered the heterogeneity and variability in the language development of the

autistic children. A classic example was seen in the studies on a huge sample of the autistic toddlers whose IQ scores revealed that at 18 months, their first words have been made making it to be within the expectation of normal language production. Meanwhile, up to 5% of these children did not speak their first words (Wilson et al., 2003). Similarly, another two large samples of preschool-age children with autism established that in measuring both expressive and receptive language, while some children scored two years above their age level, with scored two years below their age level (Fulton & D'Entremont, 2013; Hudry et al., 2010).

Furthermore, the receptive vocabulary of some teenagers with autism in other large studies revealed that some autistic children with autism, on average attained scores as low as four standard deviations (which is lesser than normal), while other children with autism attained higher scores of two standard deviations to transcend the normal (Nation et al., 2006). Jasmine et al. (2009) and Joseph et al. (2005) in separate studies also reported the same case whereby the receptive vocabulary of some sampled school-age autistic children showed two and four standard deviations below and above the normal respectively. Another close report from Ricketts et al. (2013) indicated that the receptive vocabulary of some autistic teens' reading ranged from one standard deviation above the normal level, but three standard deviations less than the normal level. The above suggested that there is a huge variability in the language development of the autistics as some groups truly have language delay while some subgroups do not. Some large samples have shown that the range of standard deviations of two below and above actually exist (see Gernsbacher, Morson & Grace, 2015).

In another critical perspective about the nature of language development or receptive and expressive skills of the autistic children, studies have shown the language development of the autistics to be *flat* than that of children with other developmental disabilities (Landa & Garrett-Mayer, 2006). Other studies have revealed that the trajectories of language development of the autistics can be steeper, meaning that there is a possible acceleration after a delay. This notion was explicitly mentioned in other studies where both expressive and receptive language skills of children with autism at grade-level school-age were noticed to start at lower level than that of those typically developing boys. Meanwhile, after the period of nine years, the language of the autistic boys on average, by 10% per annum got better, while 1.6% per annum was recorded for the typically developing (Cariello et al., 2011). This was further corroborated in another study with a view that the language development of the

autistic children moved upward at age nine, but on the other hand, the non-autistic children (whose developmental disorders were not autism), experienced plateaued language development (Anderson et al., 2007).

Moreover, data from Dockrell et al. (2010) modified by Gernsbacher, Morson & Grace (2015) gave another perspective about the nature of language development of the autistic children in terms of their receptive and expressive skills. The data exemplified the growth of expressive language (Figure 2.9a) and receptive language (Figure 2.9b) of more than 100 children with autism in grade-school-age for a period of four years, with other non-autistic children (grade-school-age with other language disabilities) totalling 200 illustrated alongside the autistic grade-school children is a matched sample of over 200 grade-school children who were not autistic but had language disabilities. The data illustrated performance on both receptive and expressive language skills of the two groups using the Clinical Evaluation of Language Fundamentals measurement (Semel et al., 2006). Below are the z-scores of zero and one norms-based mean and standard deviation respectively.

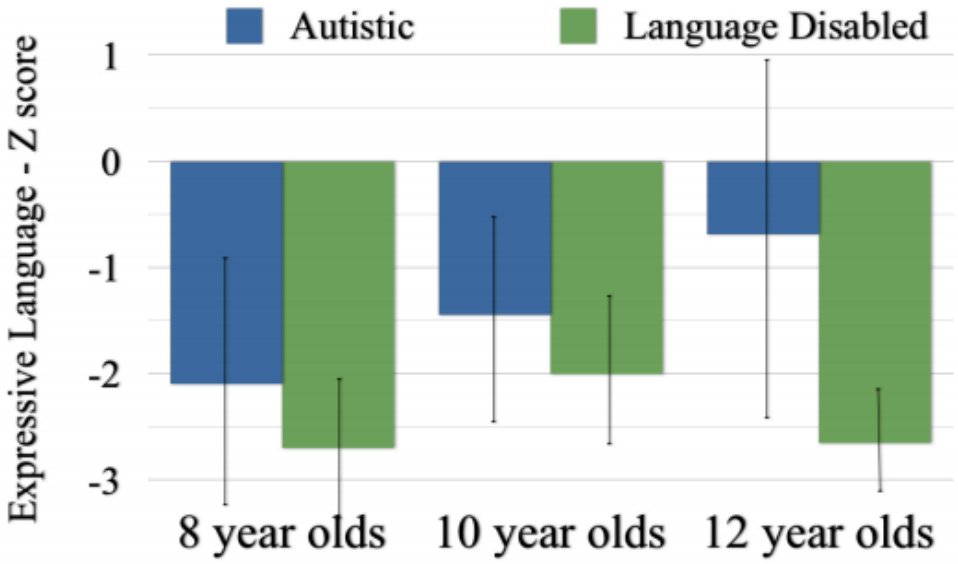

Figure 2.9a showing the expressive language skills of the autistics and other children with other language disabilities (Source: Gernsbacher, Morson & Grace, 2015, p. 881)

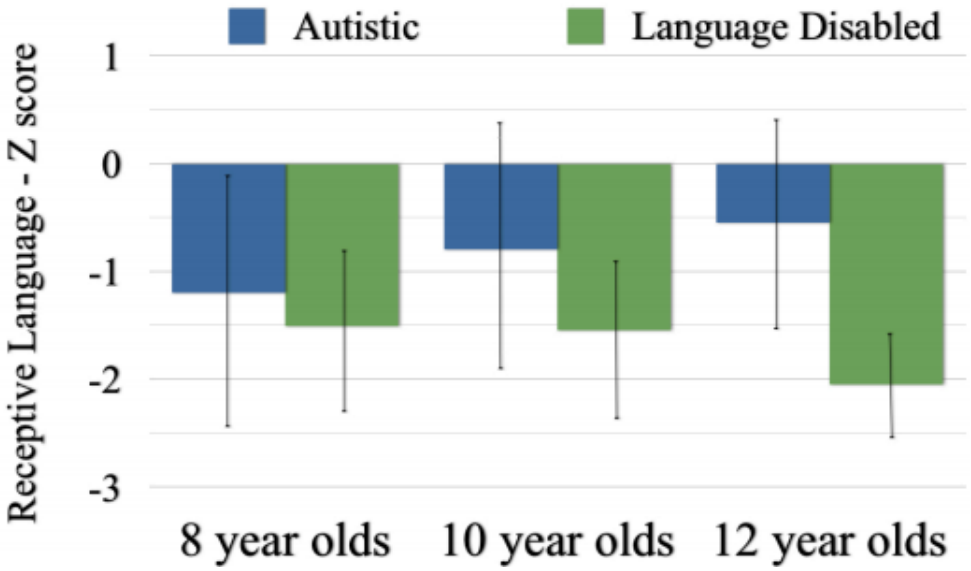

Figure 2.9b showing the receptive language skills of the autistics and other children with other language disabilities (Source: Gernsbacher Morson, & Grace, 2015, p. 882).

Figure 2.9a and 2.9b show that the autistics sampled in the study got better in their expressive skill as they grew older whereas the second group, the non-autistic children, showed no improvement in their receptive and expressive language skills. As revealed by these cross-sectional data, for the autistic children, the language development trajectory was increasingly steep, and thus made the autistics' language skills to be the same as normal (Gernsbacher, Morson & Grace, 2015) Similarly, some other facts emerged from a few studies which monitored the language development of some children with autism to adulthood (see Dawson, Mottron & Gernsbacher, 2008), and one of the longitudinal studies monitored 29 adults with autism but with history of language delays during their childhood and other 35 autistic adults without history of language delays. It was established that in their adulthood, no difference emerged in their receptive and expressive vocabulary (Howlin, 2003; Gernsbacher, Morson & Grace, 2015).

The above indicated that the trajectories of language development in autistics may be flatter during their earlier childhood than that of the non-autistics or those with other language disorders, but sometimes improves over years of growth, and thereby makes the language development of the autistics steeper as the initial delays experienced gradually grew into normal language skills. That however showed that the language trajectories of the autistics varied extremely from a group/ individual to another (Gernsbacher, Morson & Grace, 2015).

Another point concerning the nature of language development of the autistics in the light of their expressive and receptive language skills centres on whether these skills are delayed or deviant. One of the classical examples revealed that toddlers and preschool age children with autism (when compared with their age mates who are typically developing) might have the same receptive vocabularies with varied grammatical aspects (such as pronouns, nouns, and verbs, etc.) as well as words from semantic aspects (like parts of the body, people, games and routines, etc.) (Charman et al., 2003; Gernsbacher, Morson & Grace, 2015). Similarly, when some preschool children with other developmental abilities (non-autistic) were compared with the autistic preschool children no difference was established in their accurate production of tenses (past inflections), numbers (plurals and singulars), noun phrases and structures of sentences (Park et al., 2012; Gernsbacher, Morson & Grace, 2015).

In the same token, studies from Norbury and colleagues also corroborated the above notion with some facts that while comparing the sequential success of a number of comprehension processes in language, the children in their grade-school-age autistic and non-autistic grade-school-age were the same. For example, it has been established that the autistic children in their grade-school age can acquire the following aspects of language: *idiomatic expressions* (Norbury, 2004; see also Gernsbacher & PripasKapit, 2012; and Gernsbacher et al., 2015); metaphorical expressions (Norbury, 2005b); reference drawing abilities from various stories (Norbury & Bishop, 2002; see also Young et al., 2005; Gernsbacher et al., 2015); negotiating ambiguities in language usage (Norbury, 2005a) and structuring the stories being told (Norbury & Bishop, 2003; see Gernsbacher et al. 2015). In the same token, Nonbury and colleagues further emphasised in their studies of four focus groups comprising (i) non-autistic children with language impairment, (ii) non-autistic without language impairment, (iii) children with autism without language impairment, and (iv) children with autism and language impairment indicated that language development and autistic traits are independent (Norbury, 2005a; Gernsbacher et al. 2015).

In another development, language loss as part of the autistic language development is not fully discussed here, but Bernabei et al. (2007) for instance suggested that unlike those autistic children without language loss, some autistic children (with language loss) may likely fail to progress in language development afterward as seen in some autistic children at age six. While some children with autism have been making sentences, the autistic children (who have lost language earlier) were found producing single words. In sum, development of

language in autistic children is not deviant but usually gets decelerated, and also that language development in children with autism is largely heterogeneous (Gernsbacher et al., 2015; see Kwok et al., 2005). The essence of establishing the nature of both expressive and receptive gap phenomenon will enable contemporary studies on linguistic aspects of ASD such as this study to find out whether autistic children are skilful or competent in receptive or expressive language. Such understanding can easily emanate from the verbal ones but it may also help pinpoint whether their receptive or expressive language skills or abilities is better at either home or school.

2.7 Bilingualism/ Multilingualism and Autism

Bi/multilingualism has been approached from different angles of psychological fields which mostly include educational psychology, psycholinguistics (of children's language), developmental psychology, and social psychology. Both terms which are rarely distinguished in research are topical subjects discussed mostly in applied linguistics, and essentially in respect of language acquisition and its use for communication in different social contexts and for social interaction. Bi/ multilingualism have multiple definitions which are approached, and interpreted differently from diverse studies. Within the scope of this study, the term, bi/multilingual autistic children, denotes all children with ASD (verbal or non-verbal) who were raised by bilingual or multilingual parents, and who are also receiving service from educators, speech and language therapists, and clinicians or pediatricians. The term as used in this study does not signify that these children are minimally or proficiently using or learning two or more languages.

It is understandable that acquiring bi/multilingualism is a unique and typical childhood phenomenon and thus indicating the capability of learning two or more languages during childhood development (see Genesee, 2001), the profiles of the bi/multilinguals are diverse maybe as a result of their varied forms of exposure to language. Precisely, bi/multilinguals may take any form of the following as recorded by Fletcher-Watson (2017, p. 3):

i. Bilinguals: this concerns people who understand two languages.
ii. Multilinguals or polyglots: these individuals understand multiple languages.
iii. Bimodal bilinguals: these individuals understand both signed and spoken languages.
iv. Simultaneous bilinguals: from birth, these people learned not fewer than two languages

v. Early sequential bilinguals: this involves a child who learned second language at childhood.
vi. Late sequential bilinguals: at later stage of life, these individuals learned their second language.
vii. Balanced bilinguals: these people have almost the same abilities in bi/multilingualism.
viii. Imbalanced bilinguals: the individuals here have higher competence in one or more languages, whereby the prevailing languages diverging between domains.

Notably, a number of complex dichotomies or typologies have been employed to explain bi/multilingualism from the point of individual, and social levels among others (Institute of Medicine and National Research Council, 1997; Weinreich, 1953; Lambert et al., 1958), but the idea of *individual* bi/multilingualism is not exclusive of *social* bi/multilingualism or devoid of group or shared social grammar (Bhatia, 2017). In South Africa, bi/multilingualism is mostly deployed at both *individual and social* levels and thus offers an opportunity to use both languages (mother tongue say, isiXhosa, isiZulu or siSwati, and one other language - here English) for individual and as well for public matters. This is not the case for those in typical rural areas with less education and that does not remove the fact that bi/multilingualism is widespread and universal (see Bhatia, 2017; Bhatia & Ritchie, 2013).

Interestingly, human brain could develop, process and comprehend more than one language especially during the childhood stage, which is significant in showing the cognitive benefits the bi/multilingual has over the monolingual. Such brain ability could be incorporated into the description of bi/ multilingualism as well. Notably, studies have demonstrated the power and ability of human brain in terms of cognitive flexibility—ability to switch successfully from one task or mental set to another (Miyake et al., 2000; Fajerson, 2017), and in respect of bi/multilingualism. It has been identified that processing one language results to activation of both languages in the bilinguals' minds (Grosjean, 1989; Green, 1998; Costa, 2005; Rodriguez-Fornells et al., 2005). Often, information from these active but competing language processing systems seems to be interfering and thus require that one needs to be inhibited while the most relevant at that time is made active (Nicoladis, Hui & Wiebe, 2018; Fornells et al., 2006; Abutalebi & Green, 2007; Costa et al., 2009; Festman & Münte, 2012). It has also been reported that the system of inhibiting and activating could lead to another task of cognitive flexibility and processing of attention. Some researchers have argued that bilinguals' experience with selecting and inhibiting languages could generalise to other tasks

involving attention processing and cognitive flexibility (Nicoladis, Hui & Wiebe, 2018; Bialystok, 2001; Bialystok et al., 2005). Bilinguals, unlike monolinguals, have also been linked with enhanced executive function (which is an attention-related skill) which further paces up switching their tasks (Costa, Hernandez & Sebastian-Galles, 2008). From various dimensions such as switching from congruent and incongruent stimuli trials (Costa, Hernandez & Sebastian-Galles, 2008), Dimensional Complex Card Sorting Task (Carlson & Meltzoff, 2008) etc. executive function has been investigated in both bilinguals and monolinguals and the results indicated that bilinguals have enhanced executive functions than the monolinguals (see Fajerson, 2017).

Furthermore, some studies have established the advantages of being bilingual over being monolingual – a broad spectrum of cognitive evaluation (Bialystok, 1999; Bialystok, Craik & Ruocco, 2006; Bialystok, Craik & Ryan, 2006; Carlson & Meltzoff, 2008; Costa, Hernandez & Sebastian-Gallès, 2008), and on specific terms and across lifetime (Kapa & Colombo, 2013). The help of some relevant language comprehension tools such as functional magnetic resonance imaging (fMRI), data from event-related brain potential (ERP), as well as psycholinguistic model of word processing such as BIA+ model, the bilingual's modes of brain spatial activation provide good interpretation and theoretical framework in this direction (van Heuvena & Dijkstrab, 2013).

The research that involved bilinguals' cognitive assessment include babies (Kovàcs & Mehler, 2009a, 2009b), toddlers (Poulin-Dubois, Blaye, Coutya & Bialystok, 2011) bilingual preschool children (Bialystok, 1999; Bialystok & Martin, 2004; Carlson & Meltzoff, 2008; Yoshida, Tran, Benitez & Kuwabara, 2011), young adults (Costa, Hernàndez, Costa-Faidella & Sebastiàn-Gallès, 2009; Costa et al., 2008; Prior & MacWhinney, 2010) as well as older adults (Bialystok, Craik & Freedman, 2007; Bialystok, Craik, Klein & Viswanathan, 2004). Recently, it was recorded that the bilinguals from different language pairs benefit also from multiple cognitive control tasks, and thus indicated that the effects are not only on single language pair or task (van Heuvena & Dijkstrab, 2013; see Adesope, Lavin, Thompson & Ungerleider, 2010). Despite the above claims, many findings have found otherwise, thus resulting in hot debates on the advantages of bilingualism on cognitive aging, plasticity of brain and executive functions which according to Antoniou (2019) has made the linguistic field to reach a point of impasse. Meanwhile, Haft et al. (2019) recently disputed the notion that bilinguals have advantage than the monolinguals in areas of cognitive ability or control

relating to attention, inhibition, cognitive flexibility, and working memory. Notwithstanding the controversies in their findings, some neuroimaging studies suggested that both similarities and differences on the neural network activation in the bilinguals' brain during the processing of L1 and L2, require complex brain network (Liu & Cao, 2016). In addition, Haft et al., maintained that proving the (dis)advantage of bilingual is not necessarily important like concentrating on research that focuses on what circumstances may lead to having nexus between cognitive control and bilingualism or what circumstances do not lead to such association.

In relation to autism, all advantages of bilingualism on executive functions, cognitive ability of individuals are not heterogeneous, and only few studies are at present helping the parents and or professionals to make right decisions on the use of bilingualism or multilingualism for children with autism. In relation to pragmatics, that is, social communication, findings from Bishop (2004, 2006) suggested that in terms of pragmatic skills, no significance difference was found between the bilingual and monolingual children with autism (see Lam, 2015).

In the study of language-related disorders, ASD in particular, there are controversies on whether an autistic child should speak only one language or two. Many times, many bilingual / multilingual parents of autistic children are advised to employ one language with their kids, and such advice usually comes from the clinicians and educators with little thought on dearth of studies on bilingualism and autistic children (Seung, Siddiqi & Elder, 2006, Park, 2014; Yu, 2013 etc.). In the US for instance, language families considered as minority are usually involved since English is often advocated as the target language (Yu, 2015). The Centre for Disease Control (CDC) usually updates its statistics on the prevalence of ASD but not on the language-based demographics of the autistic children. Based on that, the effect of being raised bilingually on the linguistic development of children with ASD is less known (Seung et al., 2006; Valicenti-McDermott et al., 2012; Park, 2014).

Furthermore, Stritikus and Garcia (2005) and Yu (2015) stated that the usual defence for such advice is a belief that exposing children to more than a language might lead to confusion or delay their language development. The authors also mentioned that it is also believed that efficacy of interventions may be compromised by engaging in bilingualism and multilingualism and acquisition of English. Seung et al., (2006) and Park (2014) added that in most cases, when children are diagnosed with ASD, the first concern usually centres on how

s/he will develop language, and central to the child's interactions with family, child's treatment and education is language input and output; and when parents' L1 is differs from the main medium of instruction at schools and clinical services, the decision to choose language practices becomes difficult. The authors said the reason for such problem is connected with fear entertained by numerous educators and clinicians that exposing children with ASD to dual languages may lead to additional burdens and stunted language development.

Hambly and Fombonne (2012) reiterated absence of negative impact of exposing children with autism to dual language environment, and that no other language delay was found in their language development. There was also no reported significant difference in the language level of both monolingual and bilingual autistic children. Similarly, Genesee (2006) suggested that the above findings showed some bilingualism-exposed children with language impairments achieve language acquisition to the same level as the monolingual but with varied degree.

In KwaZulu-Natal, isiZulu and English are predominant languages, and parents of the autistic children rely heavily on the advice of the psychologists, clinicians and educators whose majority's knowledge about ASD is below average. While the educated parents of children with autism alternate two or more languages, depending on the number of languages they are proficient in, the uneducated parents are prone to training their children with autism in their mother tongue (MT) alone. The special schools for the autistics observed were mostly bilingual (isiZulu and English) and thereby educating the children with autism bilingually in some cases. Being a multilingual society, South Africa has 11 distinct official languages: isiZulu, isiNdebele, Afrikaans, English, Tshivenda, Sepedi, Sesotho, SiSwati, Setswana, isiXhosa, and Xitsonga, with the majority of people speaking more than one language.

There are various questions on this matter, and the prominent one is whether bilingualism is detrimental to autistic children at home and at school. Many of the studies conducted on the connection of bilingualism and ASD indicate that bilingualism does not negatively impact ASD. Notably, two groups (the monolingual and bilingual autistic children in terms of their performance could be compared using different developmental assessments which include the age of their first words and phrases, size of their vocabulary, frequency of their social initiations, size of their vocabulary, their performance on standard language tests, scores of

their functional communication, levels of attention to speech and responsiveness, and degree of autism symptoms being experienced (Hambly & Fombonne, 2012; Ohashi et al., 2012; Petersen et al., 2012; Reetzke et al., 2015; Valicenti-McDermott et al., 2013; Yu, 2016).

The insight above indicates that advising some parents to switch to monolingualism is not valid. To some bilingual families who adopted a monolingual system, English has been suggested to be the language of communication and interaction. However, the use of only English with their autistic children has caused their bilingual families numerous challenges (Park, 2014), because many of the autistic children lack affective interaction. According to Wharton et al. (2000) in Park (2014, p. 125), "parents have a harder time making an emotional connection with their children when they cannot speak to them in their native language; bilingual parents often show more affect when using their native language because it is typically more comfortable for them".

Importantly, because of bilingual capacities in children with ASD, bilingualism should be encouraged for the sake of effective communication, social interaction with others inside and outside home, and for ethnic identities etc. (Kremer-Sadlik, 2005; Wharton et al., 2000; Yu, 2009; Park, 2014). It was discovered that the linguistic and communicative situation of autistic children, their parents and educators in South Africa are dichotomous. The first is related to the clinicians/caregivers, educators and parents of the children of the autistics who have little or no knowledge of autism and the second is the same set of people with average or above average knowledge of ASD. While the former in most cases adopt monolingualism (usually the MT-isiZulu of the autistic children) to communicate, teach and attend to the autistics; the latter combine two or more languages (but mostly isiZulu and English). The implication of this at home and school on the linguistics and communication competence of the autistics cut across both expressive and receptive language abilities as there may be more deficit in lexical/ vocabulary, pragmatics/discourse, grammatical as well as strategic, and semiotic competencies (see section on competencies above) of the autistic children nurtured by the first set of people mentioned above than those nurtured by the second set.

2.9 Summary

This chapter took an in-depth review of relevant literature to this study. The chapter made holistic approaches to explain topics and their nexus from different disciplines. The chapter employed relevant previous studies to present different ideas and concepts in relation to ASD,

sociolinguistics, neurolinguistics, psycholinguistics, and childhood education among others. The next chapter focuses on the theoretical framework adopted for the study.

CHAPTER THREE

THEORETICAL AND CONCEPTUAL FRAMEWORK

3.1 Introduction

The previous chapter of this study conducted an in-depth review of relevant literature. This chapter focuses on the theoretical and conceptual framework, which guide the study. The chapter also contextualises and explains in detail three theories and one conceptual framework which are relevant for this study. The first one, Theory of Mind (ToM) and its embedded form known as Explicit and Implicit Spontaneous Theory of Mind, is explained within the context of ASD, reasoning, and mental state language, among others. The second theory discusses Disrupted Connectivity Hypothesis (DCH) of ASD, which centres on the clinical account for ASD symptoms through pathophysiologic model. The third one covers the core aspects of psycholinguistics and some of its theories such as innate theory, behavioural theory, cognitive theory, and socio-pragmatic theory. The chapter also explicates conceptually, the imports from neurolinguistics towards understanding the nature and functions of brain system and its impact on linguistic and communicative competence of bi/multilingual children with autism.

3.3 Theory of Mind and Autism

Theory of mind (ToM) is a significant aspect of theoretical framework adopted for this study as it is connected to impairments of mind capabilities. In the middle of 1980s, Baron-Cohen and his colleagues in their seminal investigation introduced ToM to explain integrated cognitive bases of main symptoms of social and communication manifestations in ASD. Their discovery serves as a revolution concerning understanding main behavioural traits of children with neurodevelopmental disorder (Tager-Flusburg, 2007). Their discovery was basically that the autistics have fundamental deficit in attributing mental states such as intentions, desires, beliefs to others as well as to themselves, and as a result fail to forecast and describe behaviour in everyday interactions sensibly (Baron-Cohen et al., 1985; Sodian, Schuwerk & Kristen, 2015). From the philosophical consciousness of reality, this theory refers to individual's ability to deduce others' thinking or feeling even if it is a simulated version of what may be going on in others' brain and with a thought of how they process the information they are receiving based on what one knows or had experienced in relation to their own, and doing tasks such as construction of theory concerning activities going on in

their mind, which may also determine their action and reaction even towards others. Edelson (2018) simply stated that ToM assumes a notion that an autistic individual lacks or has poor understanding of other people's emotion, attitudes and beliefs because the autistic may not understand that individuals have their own perceptions, thoughts and plans. This inability or difficulty in understanding other's different ways of thought is partly evidence that associates with difficulty or deficit in communicating and socially relating to others.

Many tasks to test this theory have however been administered to both autistics and non-autistics and those with mental disability, and the autistic show a manifestation of absence of ToM meaning that ToM is unique to autistics (Edelson, 2018). Baron-Cohen et al.'s innovation of Sally-Anne false belief skit or narration remains a popular classical illustration of how ToM works. Generally, children at four years of age can use their mental-state to understand certain tasks including the false-belief tasks that entail "a child to distinguish between the world as it really is and the way it might be represented (incorrectly) in the mind of another person" (Tager-Flusburg, 2007, p. 311). Sally and Anne have a basket and a box respectively. After Sally puts a ball into her basket, she leaves the stage and Anne comes in and removes the ball then puts it into her box. After a while, Sally returns to the stage on a lookout for the ball. The notable notion is that the thought of almost (if not all) typically developing individuals about where Sally will be looking for the ball is in the basket. This imagination of how the brain works signifies the thought of knowing what Sally knows, but for individuals with autism, a larger number of them will point to the box as where Sally's ball is because they have no thought different from what Sally is believed to know. Therefore, the inability of ToM construction may be responsible for social and communication symptoms noticeable in ASD (see Fig. 3.1 below). This picture illustrates Sally and Anne with their basket and box narrative diagram.

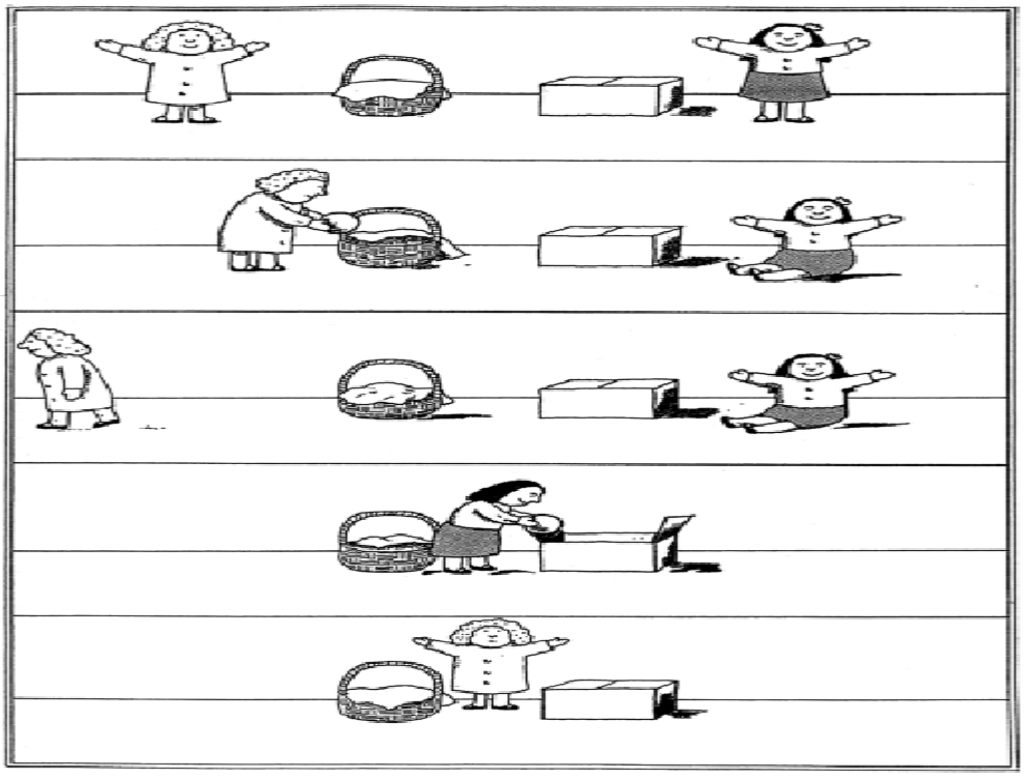

Figure.3.1 *Sally and Anne* Sources: Frith, (1989, p. 89; Tager-Flusburg, 2007, p.312).

Systematically, the twelve-year old participants with autism employed by Baron-Cohen et al. (1985) in their early studies on ToM tasks indicated the failure of the participants to infer using their own knowledge the possible new place Anne has put the ball. It was concluded that ASD children failed the test while other participants (children with Down's syndrome and those without any atypical development) who "were matched for mental age passed the task" (Sodian, Schuwerk & Kristen, 2015, p.113). Tager-Flusburg (2007, p. 311) explained, "Deficits in the acquisition of a theory of mind provided a plausible explanation for the major symptoms of autism, especially impairments in social reciprocity and communication, thus providing the first integrated account of the cognitive mechanisms that might underlie several key behaviors that define the disorder." However, several applauds throng in for these studies which have in several occasions been adapted by many researchers (e.g., Baron-Cohen et al., 2012), but there has seen some skepticism concerning the relevance, uniqueness to ASD, ability to detect it earlier, and the universality of this theory's claim (Tager-Flusberg, 2001). This will be returned to later. Tager-Flusburg (2007, p. 311) raised some questions such as: (i) Do children with autism develop theory-of-mind concepts? (ii) How can we explain why some children with autism pass theory-of-mind tasks? (iii) Do deficits in theory of mind

account for the major impairments that characterise autistic disorder? These questions are crucial to the understanding of conflicting reports on ToM. The main shortcomings of this theory include its narrowness to explicate main ASD impairments (i.e., stereotypical behaviour, and social-communicative competence); and the theory fails to account for the positive traits such as strong visual-attention skills of the autistic individuals. Significantly, new trends have shown the complexity and heterogeneity of some neurodevelopmental disorders including autism and as such, using one cognitive approach and explanation exclusively to account for diverse symptoms including the socio-communication difficulties of ASD may not be tenable (Tager-Flusburg, 2007).

Recent research has however indicated no doubt concerning difficulty faced by both people with ASD in the processing of mental-state information. That is, when these people are inferring mental-states, they often employ neurocognitive systems which differ from people without ASD; "…and that performance on theory-of-mind tasks can account for some, though not all, of the severity of the social and communication symptoms that define this disorder" (Tager-Flusgurg, 2007, p. 312). This is consistent with the results found by Begeer et al. (2011) in their ToM treatment study in which 40 (8 to13-year old) children with ASD and with normal IQs participated. The results indicated no improvement in subjects' self-reported and parent-reported empathic skills and social behaviour respectively and in their elementary understanding; but improvement was recorded for their conceptual ToM abilities or skills. The study also established weak life mindreading skills on a daily basis in relation to effectiveness of ToM treatment.

Similarly, some research has narrowed the scope of ToM as applied to autism and transition to only 4-year-olds. This is an assumed first period for children to typically comprehend false-belief. In addition, the notion of mere passing or failing false-belief test is an indication of reduction in "a complex social-cognitive developmental progression" (Tager-Flusgurg, 2007, p. 312) which thereby depicts absence of ToM as a main yardstick to define autism. However, some studies have shown that autistic children can also pass tasks of false-belief even when some people with other disorders like non-signing have failed this test (Peterson, Wellman & Liu, 2005).

Some recent studies took comprehensive approach on ToM tasks for different age groups. Steele, Joseph, and Tager-Flusberg (2003) for instance in a longitudinal study of scores of children with autism reported that more than the average number of participating children

recorded some gains over a year despite that they all have delays in respect of their age; and that only few adolescents completed some advanced tasks successfully (Tager-Flusburg, 2007).

In 2005, Peterson and colleagues in a study similar to the above employed five-task method to depict certain ToM concepts that include concealed feelings or emotions, false belief, and personal desire. The results indicated that the group of autistic children found hidden emotions easier than false belief unlike their typically developing counterparts. The report further established that while the autistic children have unique difficulty in developing some cognitive states and belief; some have little understanding of emotion as well as desire (Peterson et al., 2005; Tager-Flusburg, 2007). Despite the weaknesses of ToM, some aspect of the theory may help in understanding the presence, absence, or level of cognitive mechanisms among children with ASD, and in turn help explicate their mental state, ability to infer others' actions or thoughts. This theory may help to answer research question 4 and 5 which require understanding the cognitive mechanisms of autistic individuals in various social interactions and for inferring meanings.

3.4 Language, Executive Functions and Theory of Mind among Bi/multilingual Autistic Children

Questions of how some autistic children pass ToM tasks are common. Children (either monolingual, bi/multilingual) with ASD who take ToM tasks have difficulty in logical reasoning; thereby, instead of resting on social insights, they rely mainly on language and some "nonsocial cognitive processes" while their non-autistic counterparts rely on some intuitions to gain social insights into certain tasks that require general cognitive abilities, and which aid verbal processing, narrating events through memory, and spontaneous responses inhibition (Tager-Flusburg, 2007). Similarly, bi/multilingual children with autism exhibit deficit executive function which needs flexibility, inhibitory control and working memory, as well as planning (Ozonoff et al., 2004). For both typically developing children and those with autism, how false belief tasks are carried out is essential to all aspects of executive function earlier mentioned (Joseph & Tager-Flusberg, 2004). Meanwhile, passing false-belief tasks is very likely if a child has better inhibitory control and planning skills based on the notion that one needs instilling false representation in his/ her working memory before he /she can carry out false-belief tasks successfully though with avoidance of predicting what he/she knows as truth about other's action (Tager-Flusburg, 2007).

Some few studies have also attempted training for the autistics to improve their ToM skills especially in social interactions (see Begeer et al., 2010) but relying mostly on self-reported narratives from the parents and the teachers on how such children apply ToM because it is quite difficult to measure such action using randomised controlled trials-RCTs (Begeer et al., 2011). Social interactions in this view have a tie with discourse and pragmatic skills of individuals and influence their competence in that respect. Only two studies have used RCTs to train the autistics for ToM skills: Fisher and Happe (2005), and Silver and Oakes (2001). The former employed picture in the head procedure by Swettenham et al. (1996), for their participants aged 6-16 years and with different cognitive capabilities. The training for their poor ToM skills involved inclusion of 10 individual 20–25 min sessions that lasted 5–8 days. The result indicated improved performances in ToM skills of children trained when compared to the control group. These children were followed up to 6-12 weeks and the report indicated stability in their performances but with no effect on their ToM in terms of skills for recognising emotions (Fisher & Happe, 2005; Begeer et al., 2011).

The latter in another study on RCTs reported the effect of computer programme on training emotion recognition in participants aged 6 to18 years (with different cognitive abilities). In addition, there were improved cognitive abilities (at different levels when compared to the control group in terms of "emotion recognition in cartoons and second order Theory of Mind reasoning, but not on their recognition of facial emotional expressions" (Silver & Oakes, 2001; Begeer et al., 2011, p. 998). The same improvement was also obtained from a study of some high functioning adults with ASD (i.e., the HFASD) according to Golan and BaronCohen's (2006) findings from two controlled but non-randomised trials of emotion recognitions and mental states on computer programme. Nonetheless, the findings found no improvement "on tasks targeting emotion and mental state recognition skills that were not used in the training" (Golan & BaronCohen, 2006; Begeer et al., 2011, p. 998). Crucially, whether for the autistic children or adults with ASD, investigations on training programmes for improving ToM skills generally found to be usually poor especially concerning daily life behaviours of the affected persons (Beggeer et al., 2011). Both linguistic and communicative competence of children with autism also constitutes everyday behaviour, and as observed, such competencies may not be attained at the same speed and degree; the typically developing children might have attained them.

Moreover, ToM skills development is embedded in language ability (Astington & Baird, 2005), but children with autism usually experience delay in language acquisition and difficulty in their linguistic manipulation unlike their peers, thereby posing a challenge of using language for communicative purposes (Tager-Flusburg, 2007). Studies have shown the relationships between linguistic competence in some aspects of language and performance of false belief in ToM. For instance, Happé (1995) indicated that autistic children with high test-scores in vocabulary could also replicate it in doing false-belief tasks. Similarly, Tager-Flusberg and Joseph (2005) opined that knowledge of semantics, grammar, as well as structures of embedded and complex sentences serve as indicators for passing false-belief tasks. Essentially, syntax, semantics and verbs in the communication of bi/multilingual autistic children serve as a bank of sentence making (Tager-Flusberg, 2007).

Language comprehension and language abilities are major yardsticks used to measure the majority of ToM tasks and abilities (Kimhi, 2014), and the autistic children (the high-functioning-HFASD especially) with better language abilities stand a better chance of passing the tasks (Hughes & Leekam, 2004). In addition, though to some extent, individuals with ASD, those with HFASD but with competence in syntax display good performance in false-belief task (Lind & Bowler, 2009), but this is based on the assumption that such success in ToM tasks may be based on employment of "compensatory linguistic strategies" (Khimi, 2014, p. 330). Tager-Flusberg (2007 in Khimi, 2014, p. 330) also opined that both semantics and syntax of verbs like *said* (as in "Sarah *said* that Dan is eating") "may enable the analogy of mental states to the content of speech". Language with its complexity has a great influence on performance of ToM tasks, and it can influence false-belief of autistic children irrespective of the number of languages they use. Based on the above notion, this study also considers language aspects such as grammar, discourse and pragmatics as crucial to the understanding of ToM among the participating children. Masona et al. (2008) in their study explicated complex processing of narration (comprehension) and the activation of the right hemisphere in relation to disruption of ToM among people with high functioning autism.

Noticeably, autism is characterised with inability to effectively use language to communicate within social situations or in other words, it is a disorder with difficulty in language comprehension and pragmatics (Lord & Paul, 1997; Tager-Flusberg, 1981, 1996; Wilkinson, 1998 in Masona et al., 2008). Considerably, impairments involving pragmatics of language is in connection with ToM because it entails inference making about others' thought, expertise

and feeling (Baron-Cohen, Leslie & Frith, 1985; Baron-Cohen, 1988; Happé, 1993; Tager-Flusberg, 1993, 1997; Masona et al., 2008). In addition, studies have shown that among the autistics, atypical brain activation is common during their language processing (Harris et al., 2006; Just, Cherkassky, Keller & Minshew, 2004; Kana, Keller, Cherkassky, Minshew & Just, 2006;), as well as during performance of ToM tasks (Castelli, Frith, Happé & Frith, 2002; Schultz et al., 2003; Masona et al., 2008). In a study on irony comprehension, higher level of activation in ToM regions of the autistics was found and thereby indicated the challenge encountered by the autistics with regards to language processing and ToM tasks (Wang, Lee, Sigman, & Dapretto, 2006; Masona et al., 2008). Additionally, for the purpose of discourse processing, understanding the nexus of ToM and language comprehension processing in persons with autism, and understanding the role played by protagonist's intention are very crucial (Gernbacher, Hallada & Robertson, 1998).

From neuroimaging study, to comprehend a narrative, Mason and Just (2006) identified five Parallel Networks of Discourse that aid processing of meta-sentence and figurative information to comprehend discourse; but one of the networks – a network found at bilateral medial fronta/ posterior right temporal/ parietal – which is crucial for interpreting an agent's or a protagonist's view. Therefore, for a narrative to be comprehended, this network needs to apply ToM processes effectively, and accordingly, "…discourse processing, at the neural level, requires coordination and communication among several brain regions involved in language and Theory of Mind" (Masona et al., 2008, p. 2). This study however is not specifically about discourse and pragmatics, but they inherently form crucial aspects of linguistic and communicative acts. As a result, ToM as well as other "social interpretation processes" are important tools in processing and for understanding another person's (the protagonists') deeds as well as discourses (Masona et al., 2008, p. 2; Castelli et al., 2002; Gernsbacher et al., 1998). Two examples below show how other's mind can be read or how inferences can be made.

i. "Brad had no money but he just had to have the beautiful ruby ring for his wife. Seeing
   no salespeople around, he quietly made his way closer to the ring on the counter. He was seen running out the door" (Masona et al., 2008, p. 2).
ii. "John said that Mary is sleeping" (Tager-Flusburg, 2007, p. 313).

In (a), the inference is that Brad stole the ring without explicitly mentioning it but from the information and manner in which Brad (the protagonist) approached the counter for the ring. In this case, ToM (the ability to understand other person's mind) is applicable here to unravel the characters' actions, goals, intentions within a specific narrative (Mason et al., 2015). In example (b), mental state construction in relation to the reality or an assumed reality of the speech content (which may be real or unreal) is needed to arrive at an interpretation of whether Mary was actually sleeping or not based on John said or believed. Therefore, some children with autism who develop knowledge, and listen, and speak to what others utter have the possibility to understand that the world may be represented in contrast with its corresponding reality (Tager-Flusberg, 2007).

Succinctly, language is crucial for developing what is known as explicit ToM which is meditated consciously at age one (prior to the time they can pass test questions on false-belief); typically developing children will attempt searching for Sally's ball in the basket even while talking about searching the box (Tager-Flusburg, 2007). The employment of eye-gazing in situations like this serves as a means to measure false-belief implicitly—a basis for explicit knowledge (Tager-Flusburg, 2007; Sodian, Schuwerk & Kristen, 2015). Explicit and implicit ToM have received little attention and it receives attention later. In a study by Ruffman and his colleagues, it was found that children with autism failed to look at the correct location during ToM tasks unlike their matched children with mental retardation; but while responding to questions on verbal tests, both were at the same level (Ruffman, Garnham & Ridout, 2001; see Tager-Flusberg, 2007).

The above claims imply that children with mental retardation have chances to pass eye-gaze (that is, the implicit evaluation/ measure) than the verbal-response (which is explicit measure); but children with autism were found to be in contrast with them (Tager-Flusberg, 2007). Ruffman et al. (2001) also corroborated the above with assertion that though children with autism might have passed the false-belief tasks, they seem to lack implicit measure, and this appears to be the same with high functioning autistic children who despite passing the false-belief tasks were still found without "social intuition" (Tager-Flusberg, 2007, p. 313). In addition, social world can be correctly conceived by the autistics through the development of linguistically aroused ToM; however, "their theory of mind is not based on the same foundational social insights that are provided by a domain-specific theory-of-mind mechanism" (Tager-Flusberg, 2007, p. 313). Importantly, some fMRI (Functional Magnetic

Resonance Imaging) studies on brain activations of children with autism as well as high-functioning adults and children with autism have established activation of different regions and interrelationship of these regions to account for how individuals pass or solve ToM tasks or problems. This account in comparison with the non-autistic individuals (controls) has shown a contrast in processing the same tasks or solving the same problems. For instance, for the non-autistic controls, ToM tasks are processed with the activation of the temporoparietal junction as well as medial prefrontal cortet—the areas crucial and central to socio-cognitive neural network and control of executive function. This is in contrast to the sampled autistics who activated areas capable of solving general problems (Frith & Frith, 2003; Tager-Flusberg, 2007, p. 313).

As part of the linguistic and communicative components which are central to this study, investigations have shown the nature of impaired ToM processing in relation to discourse and pragmatics (which are aspects of linguistic and communicative acts) of the autistics (see Happé, 1994), and the nature and effect of such impairment on comprehension of texts, and making inference(s) manifest in how actions, reactions, goals, intentions, of the protagonists/ characters are interpreted (Mason et al., 2009). With the aid of fMRI (Functional Magnetic Resonance Imaging), the said text processes can be accounted for in both typically developing children and children with autism, and some studies have shown different activations (Mason et al., 2009).

Furthermore, Mason et al. (2009, p. 2) reiterated that "…one would expect the autism group to have lower measures of functional connectivity than the control group both within the Theory of Mind network and between this network and other networks during discourse processing". In addition, some studies indicated that the above may be due to "functional under-connectivity noticeable between the frontal lobe and other regions found in autism in language comprehension" (Just et al., 2004; Kana et al., 2006; in Mason et al., 2009, p.2) as well as tasks on ToM (Castelli et al., 2002; Mason et al., 2009). In the same vein, studies have shown that both parietal and frontal functional connectivity are low (Cherkassky, Kana, Keller & Just, 2006; Just, Cherkassky, Keller, Kana & Minshew, 2007; in Mason et al., 2009), and these two brain parts are significant to ToM processes as their interregional under-connectivity determine the nature and functionality of brain processes of certain aspects of language comprehension.

The question in Mason et al. (2009) was whether the discourse processing in autism extends to other inferences involving other types of information or basically centres on inferences arising from people's intention (as predicated by ToM)? Mason and his colleagues demonstrated the possibility of processing three different inferences "intentional, physical, and emotional" (Mason et al., 2009, p. 3) and thereby established previous studies concerning the nexus between ToM and the emotional states (for instance see, Baron-Cohen et al., 1999). Similarly, inferences from discourse about physical states of high-functioning individuals with autism and the controls were investigated, and the result established worse performance inference-making on mental states when compared to the performance of the controls on the same tasks (Happé, 1994; Jolliffe & Baron-Cohen, 1999 in Mason et al., 2009). According to some studies, discourse-based intentional inferences may pose more problem to the autistics while the emotional inferences may pose an intermediate problem, the least impairment may come from physical inferences (Mason et al., 2009).

Similarly, in autism and people with damages in their right hemisphere, discourse processing (as in pragmatics and other linguistic and communicative components) involves the right hemisphere (RH); and that assumption has aided some related conclusion that individuals with autism may not fully engage their right hemisphere during discourse processing as their typically developing counterparts do (Ellis, Ellis, Fraser & Deb, 1994; Ozonoff & Miller, 1996; Sabbagh, 1999; Shields, Varley, Broks & Simpson, 1996; Mason et al., 2009). In addition, a recent study has shown individuals with high-functioning autism processing irony in text comprehension with much activation in their right temporal areas (Wang et al., 2006; Mason et al., 2009).

Based on the nature of this disruption in the brain, the high-functioning individuals with autism have recorded poor performances in discourse and other areas of language processing, the individuals with severe or moderate spectrum may display worse performance in language and communication overall. Some reasons may be adduced for the difficulty in processing discourse among the autistics and principal among them is much processing load which cumulate beyond what "the left-hemisphere-dominant language networks can handle" (Mason et al., 2009, p. 3). This notion is consistent with findings from some behavioural studies on how the autistics find it difficult to process pragmatics (context-based cues) for suitable inferences (see Dennis, Purvis, Barnes, Wilkinson & Winner, 2001; Minshew, Goldstein & Siegel, 1995; Ozonoff & Miller, 1996 in Mason et al., 2009). Importantly, the

challenges faced by the autistics in processing aspects of language such as pragmatics and discourse was summarised in terms of LH (Left Hemisphere) language regions being excessively bombarded with resources, and as a result may lead to processing reaching the non-relevant parts of the RH homologs from the LH language processing areas (Just, Carpenter, Keller, Eddy & Thulborn, 1996; Just, Carpenter & Varma, 1999; Just & Varma in press; Mason et al., 2009). The same experience has been recorded among stroke patients (whose LH brain regions-responsible for language processing have been affected by focal lesions) and among the typical controls (Thulborn, Carpenter & Just, 1999). Regarding the autistics, it has been said that while reading discourse that is connected, the right hemisphere tends to be more involved due to processing spillover noticeable in the left hemisphere areas. It means that more difficulties that people with ASD encounter in understanding discourse than the typically developing can be traced to right hemisphere (RH) difficulties. Considering brain structure and its properties is therefore crucial especially for describing and understanding functional connectivity, and to relate the structural attributes to the functional attributes according to what brain activation measures revealed (Mason et al., 2009).

Additionally, clues taken from discourse or pragmatics processing have shown that individuals with autism unlike the controls have different activation pattern while processing sentences with the use of the medial frontal gyrus and the right temporo-parietal junction. These areas are significant to discourse processing and their network got activated while performing ToM tasks (Castelli et al., 2002; Gallagher & Frith, 2003; Greene, Sommerville, Nystrom, Darley & Cohen, 2001; Martin & Weisberg, 2003; Moll, de Oliveira-Souza, Bramati & Grafman, 2002; Mason et al., 2009). Similarly, ToM or "Protagonist monitoring" (Mason & Just, 2006; Mason et al., 2009, p. 11) network is activated by the autistics; however, this is done arbitrarily in every situation, and thereby suggests an impaired network function. Concisely, aside from the intentional inference, for both physical and emotional inferences, activation in the right temporo-parietal region of the ToM is greater in the individuals with autism (whether being monolingual or bilingual or multilingual) but not in the controls (Mason et al., 2009).

3.5 Explicit and Implicit Theory of Mind (An Embedded Theory of Mind of Autism Spectrum Disorder)

Some weaknesses noticed in ToM in relation to autism gave some critics avenues to point out that ToM does not account for actual cognitive and social impairments especially among

people with high functioning autism (Montgomery, Stoesz & McCrimmon, 2012). Similarly, as described in earlier studies, ToM is not only restricted to people with ASD but also to the deaf (Brüne-Cohrs, 2006) and people with schizophrenia (Peterson & Siegal, 1995). In addition, skills associated with ToM may not be experimentally a replica of social-interaction as well as deficits in a real world because "…experimental situations do not pose the kinds of stressful demands on individuals with ASD that real-life social situations do. This may be one reason for the failure of ToM based interventions to enhance real-world social competencies" (Hadwin et al., 1997 in Sodian, Schuwerk & Kristen, 2015, p.113-114).

Because of the above, ToM was expanded to embrace spontaneous and implicit ToM which have received attention over a decade with a view to account for socio-cognitive impairments. The expanded ToM also accommodates understanding of social contexts in their natural state with emphasis on mental-state information processing harbinger from body gestures, faces/ eye-tracking, or voices / vocal expressions (Klin, Jones, Schultz & Volkmar, 2003; Tager-Flusberg, 2007). Report has it that individuals with autism perform woefully in experiments that concern "the core aspects of social/ affective information" (Tager-Flusburg, 2007, p. 314); and at early life, these children need social interaction in terms of verbal and body language. Failure to respond to such exercises or stimuli (e.g., joint attention, response to social stimuli serve as earliest red flag in detecting autism) and "…can be readily interpreted within a broader theory-of-mind framework that encompasses these online social-perceptual components as well as more traditional social-cognitive components" (Tager-Flusberg, 2001; Tager-Flusberg, 2007, p. 314). The broader framework being referred to include explicit and implicit ToM which constitute two hierarchies of ToM tasks and abilities. While the explicit tasks contain giving clear and direct instructions, the implicit involves measuring spontaneous ToM tasks or behaviours (Kimhi, 2014), and this was said as the reason for noticeable deficit in social interaction (Hughes & Leekam, 2004). The implicit hierarchy is also noticed as one posing more challenges to the autistics including those with HFASD (Frith, 2012). Some scholars have called for possible separation of the two hierarchies (Schneider, Slaughter, Bayliss & Dux, 2013; Senju, Southgate, White & Frith, 2009; Kimhi, 2014) maybe because of different systems involved in processing the information required. For instance, the implicit system involves parallel processing of information; that is, many items can be processed simultaneously, whereas in the explicit hierarchy, information are taken in and processed sequentially. The former system has been found to be deficient among individuals with ASD including those with HFASD (see Kimhi,

2014). Concerning individuals with ASD, a study by Senju, Southgate, White and Frith (2009) has been identified as the first to experiment eye-tracking in combination with implicit ToM, and the results established a separate system between the implicit and the explicit ToM reasoning (Sodian, Schuwerk & Kristen, 2015). Some instances may support the above further. In performing the explicit ToM tasks, both neurotypical participants and the subjects with Asperger syndrome are the same but their performance of implicit false-belief task (with the use of eye movement) differs significantly.

Sodian, Schuwerk, and Kristen (2015) further explicate that as in the explicit ToM task, the participants were made to view the agent who was absent when a ball was moved from Box A to Box B, and thereby formed the basis having a false belief about its whereabouts. In the following test phase however, the location the agent had to search for the ball (i.e., in the recently emptied box) was inexplicitly asked, and measurement of the next anticipated action that may be attempted was done through eye movements. The essence of this is to evaluate if agents' belief was tracked by the participants as concerned where the object was without requesting it explicitly. Among the adults who were neurotypical, the anticipation that the agent would look for the ball in the recently emptied box was right; whereas, such anticipation of congruent behaviour on false-belief was lacking among the individuals with ASD.

The essence of the above is to show the expanded forms that ToM has accommodated in order to comprehensively understand and undertake ToM tasks that are socio-cognitively demanding. Essentially, the above substantiates that both systems of ToM processing can be employed to study social and cognitive deficits in ASD, and the results have been profound. The first of such investigations involved 4-year-old children and infants (such as those with ASD) and the results indicated spontaneous stimuli towards others' mental states in terms of their interaction, time of gaze, and eye-tracking, but recorded failure in explicit ToM tasks (Sodian, 2011). Therefore, it is logical to state that the implicit ToM predates the explicit one (Apperly & Butterfill, 2009). For explicit ToM tasks like Salle-Anne skit, explanation of where the ball is even when it is false demands consideration of others' mental state, which can be flexibly applied to different situations that demand cognitive application. Such situation as found in Sally–Anne also involves verbal responses to questions to test the ability and assessing the mental state as well as the belief-mediated behaviour (Perner & Roessler, 2012; Sodian, Schuwerk & Kristen, 2015).

Similarly, implicit ToM reasoning in Sally-Anne task will mean spontaneous, quick, unconscious, rigid but deliberately reflecting sensitivity to mental states of others. Therefore, Sally-Anne task may rest heavily on nonverbal cues such gaze of the participant to understand his/ her belief-mediated behaviour (Clements, 1994; Sodian, Schuwerk & Kristen, 2015). Both the explicit and the implicit ToM reasoning seem to be deficit in ASD, and the possibility to tackle the deficit in each system through compensatory strategies has been proposed (Frith, 2012; Senju, 2012). This therefore suggests that explicit ToM deficit can be alleviated by individuals with ASD via engaging in compensatory learning, and such experience may be responsible for gaining "non-mentalistic routes to deal with mental states of others (Sodian, Schuwerk & Kristen, 2015). This has been also noticed among the HFASD who have passed explicit ToM tasks (Bowler, 1992). Essentially, gaze or eye-movement or gaze patterns in autism research is aimed at understanding the cognitive processes that may involve doing certain spontaneous or implicit tasks, and 1990s saw the beginning of such application to ToM (Sodian, Schuwerk & Kristen, 2015).

The idea of eye-tracking was initially debatable on how and when mental states can be attributed by children (Ruffman et al., 2011), however, various studies have shown its efficacy in ToM reasoning in terms of its visual world paradigm as employed in some psycholinguistic research (Tanenhaus et al., 1995) and especially experiment by Altmann and Kamide (Altmann & Kamide, 2009). Within the purview of ToM reasoning in autism research, eye tracking is essentially sensitive to resolve implicit reasoning (Kovács, Téglás & Endress, 2010; Sodian, Schuwerk & Kristen, 2015). Similarly, eye tracking can be used to test ASD participants on a range of activities involving socio-communication. The first instance is that socio-cognitive processes which allow inferences to be made are said to be independent of participants' verbal abilities; and the second is the advantage available to employ video presentation which individuals with ASD have huge preference for screen-mediated electronic media (Shane & Albert, 2008). In a third instance, eye tracking, unlike the traditional false belief tasks, tends to be viable to for such tasks as it does not involve intimate or real social interactions while engaging in measurement of interest and stimulus presentation (Sodian, Schuwerk & Kristen, 2015). This helps to carry out social cognition experiment without physical contact or actual interaction with the experimenter (Keri, 2013), and similarly "the burden for participants with ASD to engage in the task and to enable tapping social cognitive process, otherwise masked by a disadvantageous test setting"

(Sodian, Schuwerk & Kristen, 2015, p. 118). Another recent study by Chevallier et al. (2014) empirically corroborated the above idea, as it was reported from their computer-based instruction on ToM tasks that there is a huge gap between the performance of the neurotypical children and their counterparts with ASD but based on social setting and social cognition (Pfeiffer, Vogeley & Schilbach, 2013; Sodian, Schuwerk & Kristen, 2015).

Meanwhile, some studies have reported that those who passed the explicit ToM reasoning may not pass implicit ToM due to absence of spontaneous sensitivity to characters' false belief (Senju et al., 2009), and with that, implicit ToM seems pervasive to a point that compensatory learning cannot be modulated. Similarly, it was believed that automatic running of implicit ToM occurs without top-down control (Frith & Frith, 2008); "it should not be susceptible by alternative, non-mentalistic strategies" (Sodian, Schuwerk & Kristen, 2015, p. 120). Another study that supported the above was Callenmark, Kjellin, Rönnqist and Bölte's (2013) dissociation of process of explicit and implicit social cognition, but contrary to the above, some recent studies have established that the strict distinction may not be well-founded by saying that only the explicit ToM reasoning can be addressed by compensatory learning, and not the implicit ToM.

Succinctly, ToM reasoning in ASD requires embracing explicit and implicit/ spontaneous mental states attribution to social situation in which communication is an integral part. It further suggests considering the two systems as interdependent of performing social tasks.

3.5.1 Cross-examining Early and Later Explicit ToM in Spontaneous Mental State Language in ASD

Different areas of research have subjected ToM different descriptions and varying semantics. Premack and Woodruff (1978) and Sodian, Schuwerk and Kristen (2015) for instance stated that ToM involves the power to ascribe mental state to oneself and other. The ability or power suggests "theory" as mental states can only be inferred and not observed just like the scientific theory helps to explain data in research, so ToM aids in explaining other people's behaviour that has been observed. With a belief that the individuals have mental state representation deficit or impairment, it is "likely that their spontaneous mental state language production should also be impaired" (Sodian, Schuwerk & Kristen, 2015, p. 121).

As early as age two, children use psychological mental state to refer to both abstract and non-visible entities by employing terms like “wants” to indicate volition states; “hard to do” to suggest ability; “see” to denote perception; “hungry” to show a physiological state; “sad” to suggest emotional state; “good” to indicate moral terms; “know” to show a cognitive state (Bretherton & Beeghly, 1982; Sodian, Schuwerk & Kristen, 2015, p. 121). These states describe some insignificant or intangible processes going on within human beings and for children, these mental states or references indicate development of their explicit and verbally delivered ToM which manifest from age two of their life. Taking cues from discourse, varied conversational functions may be produced from mental state vocabulary such as when one uses “you know?” colloquially unlike for making enquiry about state of knowledge and not always establishing psychological comprehension. Notwithstanding, mental states suggesting belief, emotions, desires, knowledge in early development are evidences of authentic references (Bartsch & Wellman, 1995; Sodian, Schuwerk & Kristen, 2015, p. 121).

Investigation on the above subject is sparse but some studies have reported some discoveries relevant to observe children with ASD irrespective of raising or exposing them to one or multiple languages. Largely, uniform results have not been achieved, as some studies indicate no impairments or based on the context, and some establish impairments within a wide scope of internal state known as categories; while some studies confirm specific impairments. In an instance, children with ASD were not able to employ cognitive terms (like “think”) when playing with their favourite toys; and that they were unable to use much mental state terms unlike their neurotypical counterparts during call for attention. For a specific impairment, Tager-Flusburg (Tager-Flusberg, 1992) in a study compared the MLU-mean length of utterance of 6 boys with autism with another 6 age-matched boys within 3-6 years but with Down Syndrome (DS). The results indicated that in the use of term for desire (like “want”), as well as referring to what causes desires or their antecedents; children with ASD surpassed the control group but recorded impairment in the usage of cognitive terms and mental state terms during call for attention (Tager-Flusberg, 1992; Sodian, Schuwerk & Kristen, 2015, p. 121).

On the contrary, a study by Hadwin et al. (1997) investigated 30 children with autism aged 3-13 years and they reportedly created fewer internal state words in categories such as perception, emotion, cognition or volition after their interaction with a wordless picture-book. Rather than using toys, some studies have employed narrations from storybooks and

confirmed that children with autism displayed less terms for describing perceptive, cognitive and emotional states (46). Similarly, the autistic children when analysing picture-sequences that related to people's intention show less mental state language compared to the controls; but both (the controls and the autistics) were the same when describing pictures that indicate mechanical actions and behavioural interactions (Baron-Cohen & Frith, 1986).

In addition, using many internal states like the controls may not suggest that these children with autism are aware of their own and others' psychological states (Sodian, Schuwerk & Kristen, 2015). This is because when utilising as numerous inner state terms as controls, children with ASD made less exertion to explain the causes of mental states in their stories and they were moreover constrained in their capacity to screen and support listeners' consideration or attention when compared to the stories of matched controls (Losh & Capps, 2003). This could clarify why ordinary usage of mental state terms during wordless picture-book narration is separated from training understanding of the autistics' mental state (Hadwin et al., 1997), though training their inner state terms in a truly deliberate manner might be (Sodian, Schuwerk & Kristen, 2015). Some studies have proven the interrelatedness between the overall mind comprehension, understanding of complex emotion, and cognition talk of the autistic children. Two studies for example established significant positive connections between autistic children's ToM capability, their cognitive term usage (during story narration to others) (Capps, Losh & Thurber, 2000) and principally their false belief capabilities (Tager-Flusberg & Sullivan, 2008).

Furthermore, Losh and Capps (2003) reported dissimilar findings that the autistic children's usage of terms depicting mental states in both storybook and personal narratives is unconnected to their ToM abilities but strongly linked to their capability to explain emotions. The work of (Siller et al., 2014) show that the use of cognitive terms among children with ASD was not related to their ToM scores but related to their emotion terms usage while interacting with wordless picture book (see Sodian, Schuwerk & Kristen, 2015). Among the neurotypical children, how ToM develops, how mental state talk develops in English (Bartsch & Wellman, 1995, p.14) and in various languages spoken by children (Kristen et al., 2012); understanding of personal desire and personal beliefs come first before understanding other's false beliefs, perception, and hidden emotion, and that other people may misinterpret the mind of someone else (known as second other ToM) (Peterson, Wellman & Liu, 2005; Sodian, Schuwerk & Kristen, 2015). On the contrary, children with autism exhibit "…the

same developmental sequence up to a point, but in the later steps of progression, they show a significantly different sequence of understandings" (Peterson, Wellman & Liu, 2005; Sodian, Schuwerk & Kristen, 2015, p. 122). More experiments have been carried out on the above subject (see Sodian, Schuwerk & Kristen, 2015 for a review).

Importantly, the mental states of children with autism (either monolingual or bi/multilingual) in some contexts may be strictly linked to their ToM and in some contexts they may not. Therefore, research needs to unravel the manner or the possibility of how social attention deficit in individuals with autism (Charman, 2003) is connected with mind comprehension and children's talk (Sodian, Schuwerk & Kristen, 2015). This is a point where social-constructivists views matter because at the extreme of first year, triadic interactions which commence and involve infants, another individual(s), as well as objects/ events/ ornamental states are conceived as the beginning of ToM development (Carpendale & Lewis, 2004; Sodian, Schuwerk & Kristen, 2015). Furthermore, the view of socio-constructivists about language development as well as longitudinal research in neurotypical children corroborated the idea of joint attention skills being developmentally associated with the vocabulary of inner state language of the children (Kristen et al., 2011). The main assumption of the socio-constructivists is that through interaction and communication with other people, children involve in active construction (Symons, 2004) of ToM and not just acquiring it passively (see Sodian, Schuwerk & Kristen, 2015).

This is a similar case with semantic development (Montgomery, 2002) which Sodian, Schuwerk and Kristen (2015) also confirmed as phased and cumulative process. In sum, the significance of early communication acts and exchanges (though based on contexts) aids in reinforcing mental verbs and their meanings and similarly suggests activation of mental state terms in both known/ unknown/ spontaneous contexts through which pre-linguistic and verbal communication happen between children and other individuals. This notion suggests pivotal "role for the development of mental state language" (Sodian, Schuwerk & Kristen, 2015, p. 123). Sufficiently, clues from the above studies among others not mentioned are crucial to contextualise and explicate what ToM skills and ability are required or expected from autistic children.

3.5.2 Explicit, Spontaneous ToM and Mind-mindedness in Later Life of People with ASD

This research centres on the linguistic and communicative competence of bi/multilingual children with autism. However, later explicit spontaneous ToM associated with adults with ASD whose ToM abilities are impaired and severely impaired in their cognitive and affective (that is, studying someone's emotion from the eye region) states (Baron-Cohen, 2000 for review) are briefly referenced here. It has been reported that many are dissatisfied concerning the assessment tasks employed for ToM capabilities among adults (Sodian, Schuwerk & Kristen, 2015). Studying emotion for better understanding and measurement of affective ToM among the autistics is prominent with the use of Reading-the-Mind-in–the-Eyes task (RME-task) (Baron-Cohen et al., 2001). The task involves 36 black/white pictures, which capture the eye region and denoting emotional mental states like *admire*, *boredom*, and *jealous*. The task of the participants is to differentiate three distracters (that is, the mental states that have the same emotional look as the target) from the main or correct mental state on each trial (Sodian, Schuwerk & Kristen, 2015). Baroh-Cohen et al. (2001) and Golan et al. (2007) asserted that the degree of impairments among the autistics is reciprocally correlative with the RME task performance, and this degree among the adult individuals with autism is unlike their controls. Similarly, comprehension of cognitive state of individuals with autism is often evaluated through the Strange-Stories-test (Feltcher et al., 1995).

Furthermore, the test is also known as short stories task and it contains five mental short stories that comprise five advanced but distinct ToM abilities such as emotion understanding, deception, double bluff, misunderstanding, and deception. Therefore, the participants were required to justify the mental state of what the characters said non-literally and by that evaluate others' ToM (see Sodian, Schuwerk & Kristen, 2015). This follows some research findings (such as Happé, 1994) that advanced ToM tasks among the autistic adult are generally deficit as appeared on their both conceptual and social-perceptual level while making reference to others and self. More evidence for the impairment of the ToM of others and processes that aid mental state discernment from non-verbal such as eye gaze among the ASD group measured on RME task compared to the neurotypical participants indicated a worse performance (Baron-Cohen, 2000; Sodian, Schuwerk & Kristen, 2015). In addition, studies on ToM for self is sparse but the findings have shown worse and specific impairment in having knowledge about self (Uddin, 2011). Importantly, adults with ASD and the measurement of their ToM abilities as well as deficits are extremely specific (somewhat to

verbal needs) but widely include some varied competencies, which are underlying or responsible for spontaneous mental state (Sodian, Schuwerk & Kristen, 2015).

In a related view, the concept of Mind-Mindedness (MM) mostly discussed in developmental studies, Meins and colleagues employed it to show the tendency of difference in spontaneous act of conceiving the other in mentalistic terms, which is different from behavioural terms (Meins et al., 1998). Meins and colleagues established several mental terms after investigating some mothers who were tasked with reflecting on and describing their children. Meins and Fernyhough (2010) and Sodian, Schuwerk and Kristen (2015, p. 125) asserted that some of these mental terms include terms such as “he is reflective” in lieu of behavioural terms such as “he likes to ride his bike”; and physical terms “he has brown hair” or general terms such as “he is my neighbour” are reflection of “higher degree of mindedness in regard to others’ mind (mind-mindedness)”. The study of mental terms from Meins and colleagues (Meins & Fernyhough, 2010) has been expanded to cover work of arts, friends, and romantic partners.

Based on the works and adaptation of Meins and Fernyhough (2010) and Meins and Fernyhough (2009), Kristen, Rossmann and Sodian (2014) employed the MM-task representational of adults, and the participants were given no clues or hints on ways to answer the question but the instructions were open-ended and simple. The following: "Can you describe yourself for me? What kind of a person are you? Tell me everything you consider as important to describe yourself!" (Kristen, Rossmann & Sodian, 2014 in Sodian, Schuwerk & Kristen, 2015, p. 125) resulted to individuals with autism having no much mental self-descriptors unlike the typically-developing controls. The reason may premise on the inability of the autistics to mentally account for or reflect their own self mind-mindedness; and the same finding remained the same for accounting for non-verbal as well as verbal intelligent quotient (IQ) (Sodian, Schuwerk & Kristen, 2015, p. 125). One representational example of self-description of a male with autism (though translated from German) was captured as physical aspects and general information below.

> First, my age, and I have siblings and so on. I am 37 years of age and will turn 38 on the 29th of November. My hobbies are varied: I hike, I ride my bike, I watch TV, I go to the theatre and to the ballet, the opera. I perform on stage and I write poems. I have brown-blond hair and blue eyes. I always smile. I have had surgery, but I don’t want people to know. I’m autistic and this is important for people to know. I also repeat myself sometimes. But I will

> manage this problem. I work 8 hours a week. I'm very interested in the weather, that is my work and in maps, as a hobby. Sometimes I read books (Sodian, Schuwerk & Kristen, 2015, p. 125-126).

As noticed by Sodian and colleagues, the second excerpt below represents description of a control's mind-mindedness and shows that one may talk less but have more mind-mindedness in his or her self-description and comments to buttress that verbosity and mind-mindedness are independent. Similarly, the excerpt demonstrates a typically-developing person's fewer behavioural and general information and self-description.

> "I am a very considerate person. I reflect a lot upon myself and others. I am also very sensitive and interested in artistic aspects of human existence. I am also a bit arrogant, or at least, others might think I am arrogant. But I am also honest and trustworthy". (Sodian, Schuwerk & Kristen, 2015, p. 126).

Meanwhile, ToM of self fails to account for the accuracy of ascribing mental state (Meins & Fernyhough, 2010) and thus becomes debatable how adults with autism appropriately do self-description or ascribe mental states to self. As noticed that both impaired autobiographical memory and episodic memory are linked to impaired ToM, and in autism, it may be a good sign of identity development of impairment. First, episodic memory cannot be formed like semantic traces because without ToM, events cannot be designated as experienced (Sodian, Schuwerk & Kristen, 2015, p. 126). In addition, Tulving (1972; 1995), and Wheeler, Stuss, Tulving (1997) emphasised adult's episodic autobiographical memory as one critically involving autonoetic consciousness (that is, self-consciousness). As a result, deficit in episodic memory as found among adults with ASD may come from "a diminished level of self-consciousness at encoding" (Sodian, Schuwerk & Kristen, 2015, p. 126). Furthermore, the work of Kristen et al. (2014) has offered a germane main correlation and nexus between MM for self, episodic memory (which was used distinctly from non-verbal and verbal IQ) and well as be labeled as introspection which is crucial for remaking experience (re-experiencing) one's episodic memories and for assigning mental states to self (see Sodian, Schuwerk & Kristen, 2015). To Permer et al. (2007), other ToM tasks scored less when compared to a ToM test that employed modality-specificity in conjunction with introspection. The reason adduced was that the latter showed topmost value for the episodic memory performance.

Essentially and evidently, introspection is functionally connected to the origin of children's experience and useful for re-experiencing previous events because children require understanding the past as a source of the experience and as a meta-representation of the main experience. In addition, this may be linked to skills of meaning-making in autobiographical form (Sodian, Schuwerk & Kristen, 2015). However, constructing autobiographical memories remain "a complex, narrative process" (Bamberg, 2011; McAdams, 2001; Sodian, Schuwerk & Kristen, 2015, p. 126). Similarly, one's episodic memories may essentially and promptly need retrieval whenever the autobiographical memories are constructed haphazardly or incoherently (Sodian, Schuwerk & Kristen, 2015). Piolino (2007) in support of the above echoed that in order to state about one's past, processes of controlled retrieval are needed. Meanwhile, according to Nelson and Fivush (2004), children with ASD (like other younger children) might largely "…have a less coherently constructed cognitive memory network" and unable to cross-link the causes of events with their consequences and that these children might find it difficult to trigger the main or needed nodes within the semantic network (see Sodian, Schuwerk & Kristen, 2015, p. 126).

In conclusion, studies have demonstrated that both children and adults with autism have difficulty or deficit in referring to inner states or in comprehending mental states. As stated earlier that among children, implicit understanding is required for joint attention cues and interactions but might be lacking during their earlier development (Mundy, Sullivan & Mastergeorge, 2009) and thus lead to abnormal or delayed mental state language development (Sodian, Schuwerk & Kristen, 2015). One laboratory study from Kristen, Vuori, Sodian (n.d.) indicated that whenever the autistic children reference internal states, they only utter internal state language in a context of joint attention and in conjunction with retained attention which is found among children's complex ToM skills. One reason adduced for this is known as poverty of input arising from less usage of complex mental state language by the parents of these autistic children; and which may lead to lesser joint attention cues and being less attentive. In relation to adults with ASD, the above situations often lead to impairment in spontaneous explicit ToM (with implicit skills of how to decode-as assessed in REM tasks), and also lead to fewer usage of explicit mental verb (as assessed in Mind-Mindedness tasks) which might be as a result of deficits in joint attention (Sodian, Schuwerk & Kristen, 2015). Succinctly, many studies have proved that ToM deficits in ASD is strongly connected to spontaneous explicit ToM but the deficit is somewhat specific as both non-verbal and verbal IQ are independent of the said impairments (Sodian, Schuwerk & Kristen, 2015).

For the purpose of this study, basic ToM and the expanded form (explicit and implicit / spontaneous ToM) are crucial for understanding one's and others' mind, thought and action which in turn have implications on linguistic and communicative competence of both the neurotypically-developing children and those with developmental disorders like autism. As described earlier, absence of or deficits in ascribing mental states and mental language pragmatically in any social-communication engagement pose a serious problem to these children, especially at home and school. Understanding various underlying issues raised by the above theories is capable of remodifying and increasing both linguistic and communicative competence of bi/multilingual children with autism. However, that equally predicated on the communicative competence of parents and educators of these children with autism as research has shown that some parents of the children with autism may also be severely impaired in their communication. In a study which compared the communicative competence of parents of children with autism, specific language impairment (SLI), and down syndrome (DS), Ruser et al. (2007) reported severe deficit in communicative competence mostly among the male parents of children with autism, and among the parents with children with SLI. This result also indicated that communication impairment in autism and SLI serves as their phenotype.

3.6 The Disrupted Connectivity Hypothesis (DCH) of ASD

The last decade has experienced growing interests in the use of pathophysiologic model for the study of ASD. The focus of the disrupted connectivity theory hinges on the postulation that deficiencies in the brain coordination and synchronisation of different activity at various regions may serve as clinical symptoms of ASD. Pathophysiologic model in ASD is currently in the forefront of works on the disrupted cerebral connectivity hypothesis with an emphasis that the distant brain regions of individuals with autism contain weak connectivity whereas the local regions have increased connectivity which all together contribute to abnormalities noticed in behavioural, cognitive and social phenotype (Belmonte et al., 2004). Some other studies supported this view but further examinations revealed contrary findings based on some untested notions and other knowledge gaps which open to validity and more questions (Vasa, Mostofsky & Ewen, 2016).

The historical antecedent of disrupted connectivity hypothesis dated back to 1988 when Horwitz and colleagues discovered reduction and "correlation in positron emission

tomography signals among frontal, parietal, and subcortical regions" (Vasa, Mostofsky & Ewen, 2016, p. 245) among adults with autism. Just et al. (2004) further substantiated this finding with a report that during a sentence comprehension exercise, individuals with autism displayed reduced frontal-posterior connection. Later, similar hypotheses that local over-connectivity among autistic children evolved distinctly and that these children also possess bigger head circumference (Lainhart et al., 1997; Aylward et al., 2002; Courchesne, Carper & Akshoomoff, 2003). The case for local over-connectivity in other research also found white matter fiber connection in some nearby superficial regions (Herbert et al., 2003). One study also suggested that the local connectivity might contribute to the bigger risk noticeable in seizures as well as discharges from "subclinical" epileptic form of electroencephalography (EEG) (Hughes & Melyn, 2005 in Vasa, Mostofsky & Ewen, 2016, p. 245).

Importantly, ample evidence through fMRI studies has substantiated this hypothesis with emphasis that between subcortical and cortical regions or among several cortical regions of autistic individuals display reduced functional connectivity (Just et al., 2007; Kana et al., 2007; Kana et al., 2009). Similarly, available data from studies on resting state describe reduction of connectivity among relevant brain networks (Von dem Hagen et al., 2013; Ebisch et al., 2011) and within mode network default (Cherkassky et al., 2006; Kennedy & Courchesne, 2008; Weng et al., 2010). However, some studies have confirmed long-range under-connectivity in autism with mixed structures of long range of both over-connectivity and under-connectivity or simply, long range over-connectivity (Mizuno et al., 2006; Noonan, Haist & Muller, 2009; Turner et al., 2006; Shih et al., 2010). These findings (long-range over-connectivity or mixed patterns of connectivity) were later supported by studies on resting-state (Di Martino et al., 2011; Nair et al., 2015; Supekar et al., 2013). In a similar finding which considered local connectivity hypothesis in autism, Supekar et al. (2013) using the fRMI data reported a picture of fMRI broad local connectivity; and a mixture pattern of widespread local under-connectivity and local over-connectivity (Keown et al., 2013; Dajani & Uddin, 2016; Shuklaa, Keehna & Muller, 2010). In addition, literature on diffusion tensor imaging (DTI) in individuals with autism have demonstrated presence of reduction in their fractional anisotropy (FA), but some have also indicated a mixture of reduction and increment in FA while some mainly reported an increase (Ameis & Catani, 2015; Rane et al., 2015; Bode et al., 2011; Bashat et al., 2007; Weinstein et al, 2011; Sivaswamy et al., 2010; Cheng et al., 2010). Meanwhile, the inconsistencies noticed in the findings have been attributed mostly to studies conducted on younger children (Vasa, Mostofsky & Ewen, 2016).

In the same token, some explanations have been made to account for these inconsistencies in relation to ASD, and among them is absence of sufficient technical precision, specificity while making hypotheses, and power for correct identification of supporting evidence in studies. Other points adduced is the possibility of bias measurement with attendant variant results even for the same reasons; the relevance of alterations in connectivity in autism; and heterogeneity of adopted methods across studies which may make one result to be positive and the other negative (Vasa, Mostofsky & Ewen, 2016).

Without much ado, the positive aspect of these studies has been emerging to account for the developmental factors decisively. The work of Uddin, Supekar & Menon (2013), for instance, discovered over-connectivity and under-connectivity patterns among children and adolescents with autism respectively. Other emerging findings from Dajani and Uddin (2016), Nomi and Uddin (2015) have corroborated the hypothesis consistent with the previous findings that have indicated brain overgrowth at the earlier stage of young children with autism but seems to be normal at adulthood (Courchesne, Carper & Akshoomoff, 2003; Hazlett et al., 2011). Samples from developmental phases of life among children with autism maybe proved relevant in this case, and Vasa, Mostofsky and Ewen (2016) suggested cross-sectional samples and longitudinal studies as most potent and conclusive for addressing changes in connectivity, and that each development stage and its contribution may aid elimination of inter-individual variance as test changes over time even within the subjects. In addition, the authors reiterated that early markers of identification among the highly-risk infants and siblings serve as the core aspect of longitudinal studies. In the same vein, several biomarkers such as "atypical trajectories of change in spectral power in high-risk infants and reduced functional connectivity in high-risk infants who go on to develop ASD compared to infants who do not" (Righi et al., 2014; Tierney et al., 2012; in Vasa, Mostofsky & Ewen, 2016, p. 248).

The disrupted-connectivity of hypothesis of ASD is also essential for pinning down the heterogeneity of findings or otherwise in other patients with similar disorders. For instance, in psychiatry and some learning disabilities such as dyslexia (Giraldo-Chica & Schneider, 2015), schizophrenia (Wang et al., 2015), attention deficit/hyperactivity disorder (ADHD) (Tomasi & Volkow, 2012), and depression (Pannekoek et al., 2015); the sampled exhibited reduced long-range connectivity. Meanwhile, pathophysiologic finding across those disorders has generated questions, why it manifests similar result for clinically known dissimilar

disorders while its focus was said to be ASD. The answer by Vasa, Mostofsky and Ewen (2016, p. 248) seemed logical because "these different disorders stem from unique etiological mechanisms that converge into common neural signatures, but these signatures represent epiphenomena to the causal stream that connects genetic/cellular mechanisms to behavioral symptoms". The authors also mentioned that each disorder could have unique characteristics with its own connectivity pattern or framework but difficult to correctly distinguish. Meanwhile, distinguishing other disorders and their connectivity signature could aid pinpointing the connectivity signatures that are peculiar to autism and which may influence diagnosis comorbidity (Vasa, Mostofsky & Ewen, 2016).

Succinctly, disrupted connectivity hypothesis (DCH) is a famous pathophysiologic hypothesis that is relevant to explaining ASD in spite of some weaknesses such as higher level of inconsistencies in findings and speculations, which often come from age and clinical multiplicity. DCH also requires specific models mainly for an impaired or "altered cerebral communication in ASD whose prediction can be tested on multiple levels of analysis" (Vassa, Mostofsky & Ewen, 2015, p. 245). Additionally, DCH is not a standalone theory to account for ASD, so it needs to be connected with other relevant hypotheses or theories with psychological or psycholinguistic mechanisms or imports of ASD. According to Vassa, Mostofsky and Ewen (2015), most hypotheses under the psychological domain mostly require physiologic assessment of connectivity that are related to specific task but focus on relevant networks and involving basic science in their performance. Many studies (including the present one) have psychological domains as their target, and theoretically connect to core ASD domains like language, social-communication processing (see Dichter, 2012). In addition, ToM described earlier in this chapter theoretically links ASD to executive function; cognitive abilities and performance of mental language among others (see Ozonoff, Pennington & Rogers, 1991).

3.7 Foregrounding ASD within the Psycholinguistics and Neurolinguistics Fields

This section aims at providing the basic concepts and ideas that two broader fields of linguistics (psycholinguistics and neurolinguistics) tend to promote in relation to this study.

3.7.1 Basis of psycholinguistics

The first part of this chapter discussed theoretical framework two theories: Theory of Mind (ToM including its embedded or expanded form—Explicit and spontaneous implicit ToM in ASD) as well as Disruptive Connectivity Hypothesis (DCH) that were contextualised within ASD (as a broad language and cognitive ability of the autistics). Specifically, psycholinguistics and neurolinguistics are two interrelated disciplines that aid understanding language (especially in children), language development, language system, and language impairments. All these among others are important to linguistic and communication processing of both neurotypically-developing individuals and those with developmental disorders.

3.7.2 Psycholinguistic Theories, Linguistic and Communicative Competence and ASD

Over the years, different theories such as behavioural theory, cognitive or mentalist theory, connectionist theory, input theory, Piaget's theory of language and thought, and Bruner's discovery learning theory have been promulgated purposely for studying and analysing processes involved in language acquisition. Only three theoretical paradigms according to some schools of thought are discussed here.

- •Imitation or Behaviourism: draws from empiricist or behavioural approach.
- •Innateness or Nativism: based on the rationalistic approach.
- •Mentalist or Cognitive Theory: based on the cognitive-psychological approach.

1. Imitation, Nativism or Behaviourism Theory: This is based on empiricist or behavioural approach founded on the psychological theory of J.B. Watson (1942) (see Malmkjaer, 1991). Later, B.F. Skinner's Verbal Behavior (1957) who may be called the main figure pushed the behaviourist approach further but Leonard Bloomfield's (1933) *Language*—a structural school of linguistic theory set another pace. Bloomfieldian school of thought argued that psychological doctrines could be set aside for the study of language and thereby saw behaviouristic endeavour as scientific objectivity. Bloomfield also agreed to the role of meaning in language but questioned its importance in language study maybe due to little semantic attachment to every linguistic form at that time when human knowledge was vast. Similarly, semantics was seen as a less important element to the main or primary stimulus response connection or relationship of verbal behaviour. The stimulus response relationship

works as: Stimulus > Response > Feedback > Reinforcement. This means that children learn language one step at a time in the form of (1) Imitation (2) Repetition (3) Memorisation (4) Controlled drilling and (5) Reinforcement.

Kebbe (1995, p. 14) reiterated the above Bloomfieldians' view in another way captured below. Language can be regarded as a habit learned by a child through imitation, and during language acquisition, certain internalized data are exposed to this child and the data may be reproduced later in the course of (language) development. Additionally, language is learned the same way other habits are learned, and it is from outside.

In addition, the behaviourist theory rejected data that was not physically measurable or directly observable but believed that response to stimuli from environment is crucial to language acquisition, and for one to learn a language, correct models must be imitated (Pinker, 1994). Furthermore, the structuralist viewed language as ordered elements with finite list, which could be labeled and thereby undertook a systematic analysis of structure with another perception that learning a language does not differ from learning to do something else. Similarly, the primary focus was to induce children to behave using mechanical drills and exercises. It was also believed that teachers should depend on structural description as a combination and distribution of elements into a chain of speech, that is, following substitution and replacement process whereby one unit is replaced by another unit of the same grammatical category. They follow a taxonomic approach in teaching. Their view was also characterised by the assumption that language learning is reinforced by habitual relationship and by generalising context (this may be called generic association). They also believed in inductive system and not deductive system (see Kebbe, 1995).

Meanwhile, the weakness of behaviourist theory has been described in two folds. The first was attributed to the nature of language children produce such as their ways of handling irregular grammatical patterns. This implies that children have the language ability to replace their irregular patterns with regular patterns as they develop mentally and also process complex reasoning as they use language themselves. The second evidence was based on what children do not produce during language development/ acquisition. The American Psycholinguist, David McNeill (1933) presented it this way:

Child: Nobody don't like me.

Mother: No, say 'nobody likes me.'
Child: Nobody don't like me. (eight repetitions of this dialogue)
Mother: No, now listen carefully! Say 'nobody likes me.'
Child: Oh! Nobody don't likes me.

The above indicates that language is not about imitation, but about maturation, and for acquiring linguistic and communicative competence, the typically developing children outshine their counterparts with language disorders like autism as they mature.

2. Nativist or Innateness Theory: Noam Chomsky's school of thought contributed to the cognitive revolutions of 1950s out of weakness noticed in behaviourist's account for language acquisition. Therefore, "cognitive", "mentalist", "generative" and "transformationalist" ideas in turn, earned him a pioneer of some new approach**.** Chomsky (1965, 1977) postulated a generative account of language acquisition with the main argument that children are born with innate ability or propensity to develop language; that is, the children have the knack for developing and using language productively (see Lightbown & Spada, 2000). The above were believed to make first language learning easier. The tenet of this theory was placed on the ability of human brain and its naturally readiness for aiding language acquisition and language development in children as they are exposed to language, certain general principles automatically start to aid the discovery or structure of their language (L1 especially). Chomsky (1965) theorized initially that Universal Grammar (UG) is hard-wired into human brain and it houses Language Acquisition Device (LAD). UG has universal principles of human language, which are applicable to all languages.

UG to Chomsky helps to learn language quickly through this special device (LAD) in human brain and with that a typically developing child for instance must be able through his or her instinct understand how to blend a noun (e.g., a girl/Taiwo) and a verb (to eat) to form, meaningfully correct phrase -*A girl/ Taiwo eats* (see Ambridge & Lieven, 2011; Lemetyinen, 2012). Chomsky also professed language as mind's organ, which develops like other organs (Chomsky, 1977). According to Hulit, Howard and Fahey (2019), Chomsky also believed that by exposing to language, language acquisition and a linguistic mechanism is naturally activated. This theory is closely related to interactionist approach (based on sociocultural theory) which demonstrated that innate ability of language emerges, as humans need communication with one another. As such, humans individually and differently employ

language based on internal rules already developed on being developed as they continue expressing themselves from one situation to situation. Nevertheless, as a separate theory, the interactional theory of language development was developed with the notion that through interaction with caregivers, parents and older children learn language and the acquisition is achievable as these caregivers directed their communication and speech at children (see Pinker, 1984).

On the contrary, nativist theory has received many criticisms with fewer responses from the proponents. Essentially, adults need to play a role in enabling children to regularise their language for themselves. LAD remains controversial in terms of formulating its detailed properties when one considers the changes in generative linguistic theory in later years, and therefore, new or alternative accounts of the acquisition process have emerged. That suggests that based on positive input alone, there are several principles of grammar that cannot be learned (see Mehrpour & Forutan, 2015).

In another instance, the evolutionary anthropology saw the LAD concept as non-sensible or unsubstantial, and indicated that human body adjusts gradually as a response to the application of language, rather than a quick emergence of a complete group of binary parameters (which are found mostly among modern computers and not among human neurological systems) describing the whole possible gamut of potential grammars that might have existed or to exist (Mehrpour & Forutan, 2015). Secondly, the innate or nativist theory with its numerous hypothetical constructs (movement, empty categories, complex underlying structures, and strict binary branching) are hardly acquired from any amount of input. This also suggests that the rule-learning emphasis of mentalists' approach is over-enthusiastic.

3. Mentalist/ Cognitive Theory/ Social-Cognitive Theory: The Genevan Psychologist Jean Piaget has been credited as the main figure of cognitive theory with a proposition of cognitive development. The focus of the theory is by exploring the nexus between language skills and the phases of cognitive development.

Up to the first 18 months, many links manifest for the purpose of language learning which is connected to Piaget's 'sensory motor' intelligence. This is the way a mental picture constructs a world of objects which exclusively exist. The later part of this period is characterised by development of a sense of object permanence as well as a sense of searching

for the hidden objects. The main argument of this theory is that language acquisition must be considered within the background of intellectual development attributable to a child. It follows that cognitive foundation, which a child has already established usually gives birth to their linguistic structures. Similarly, conceptual ability needs to be developed prior to children's linguistic structures usage in order to arrive at relative judgments.

In addition, the development of cognition matches language acquisition; while there is also a parallel development of thought and language. Significantly, interaction has been noticed as another aspect in cognitive studies because understanding language's social role for communication is essential for children just as the need to communicate itself. These are possible because of intensive motivational factors for language acquisition. Therefore, social interaction and cognitive development bring focus on conscious thinking. Cognitive theory also emphasised active construction of understanding of individuals; learning results from internal mental activity rather than from imposed stimuli from external source (see Osgood, 1957). Based on the foundation laid by Piaget arose the semantic-cognitive theory. Bloom and Lahey (1978) asserted that semantic-cognitive theory also reiterates the connection between cognition and language learning, which implies that meanings are conveyed in child's speech. Specifically, the semantic focus determines the syntactic form to be employed for communication. For instance, children tend to wrongly employ a word or understand that word may have multiple meanings, and that at some occasion understand their communication theme but fail to use accurate semantics or grammar.

Notwithstanding, cognitive theory has been criticised for being prone to imprecision because to identify the linguistic features of infants (during their early language acquisition stage) from other specific cognitive behaviours may be unrealistic over time as children advance linguistically and cognitively.

4. Social-Pragmatic Theory: The social-pragmatic theory of word learning is one of the three modern theories in psycholinguistics that centre on world learning in childhood. The first theory is known as *garden-variety theory* of learning, and it emphasises that word learning does not differ from learning any other thing done in association (Smith, 2000). The second is labeled *a constraints theory* with a proposition that garden-variety learning among children also requires drawing from a priori word learning principle or constraints for the purpose of streamlining the endless unknown words within their infinite referential

possibilities (Markman 1989, 1992). Within the construct of these theories, the process follows that children's perceptual world is activated after they have mapped out a novel word within the speakers of this novel word, as well as the reason for speaking it and why it is considered irrelevant (Tomaselo, 2000). Similarly, language is largely a social issue with emphasis that new pieces of language can be learned by employing some form of joint attention focus with older users of language (Bruner, 1983; Tomasello, 1992a).

The third is *socio-pragmatic theory* which though it incorporates some garden-variety learning processes shows that word processing is largely social (Bruner, 1983; Tomasello, 1992a, 2000). These learning processes in which children learn words or other cultural conventions from other people assume different forms of cultural learning as children's attempt is to pinpoint what adults intend (especially their communicative intentions) from which children learn (Tomasello, 1999; 2000). Understanding the intention of others (and self) is critical to ASD as explained under ToM. Succinctly, the word meanings potential in children in a specific condition "are constrained to just those that are 'relevant' to the communicative situation at hand, as it is intentionally understood" (Tomasello, 2000).

Importantly as a theory of language acquisition, to be able to read others' intention (that is, the intention to communicate) is believed to commence with word learning ability (Akhtar & Tomasello, 2000). Further, the theory identifies ability to respond to joint attention as crucial to intention recognition which has been noted as facilitating word learning (Bauldwin, 1993). In addition, socio-pragmatic theory indicates further that in the second year of life, cognitive abilities that develop are essential language acquisition mechanism and not a literal coincidence (Caza, 2008). In addition, word learning also considers language as a basis of communication; therefore, when pragmatics and communicative intentions are missing, any act such as linguistic and communicative acts are a bare noise (Tomasello, 2000). Meanwhile, infant-caregiver interaction in terms of response to infant's sounds and gestures serve as a demonstration of socio-pragmatic theory.

McLaughlin (2006) highlighted the following prerequisites for social-pragmatic theory.

1.) The infant needs a caregiver in close proximity for exchange of touch, sight and hearing.

2.) The caregiver needs to provide the infant with basic physical needs such as water/food, warmth, and environment exploration.

3.) The infant needs to gradually develop physical and cognitive attachment to the caregiver.

4.) It is expected that the infant and caregiver respond to the same objects or actions simultaneously.
5.) Taking turns during verbal and nonverbal behaviours is expected of the infant and the caregiver.

The social-pragmatic theory holds communicative partner's role as significant to language acquisition as the partner's interpretation of what is said influences the meaning and action of the speech act. However, the theory may be adequate enough if there is deficit in the cognitive or physical ability of either the caregiver or the infants, but essentially good for word learning or language acquisition between ideal parent-child interactions and communications.

3.7.3 Psycholinguistic Theories, Autism and Benefits for Linguistic and Communicative Competence

All the theories mentioned above may have weaknesses; however, they have offered better viewpoints to the understanding of language development among the typically developing children particularly in their L1 situation, and to linguistic and communicative development among children with disorders like autism. Below, the above mentioned-theories are briefly contextualised to autism (ASD).

1. Behaviourist Theory: Despite its weaknesses, it has stirred parents, teachers and clinicians of children with ASD to adopt a behavioural approach to study children's language as they observe, describe, and monitor specific language behaviours of these children. The basic stimulus-response model alone is useful in imitating a sound and then influences the speech or sound production. As times goes on, these sounds are increasingly shaped and getting closer to a targeted sound which after correct production of such sound they can employ it in a variety of words for communication purposes. This process is applicable to L2/ L3 of children with autism as they can also acquire more than their L1.

2. Nativist or Innate Theory: Monolingual or bi/multilingual children with autism do not use certain language structures that correlate with cognitive ability appropriate for their age-matched controls. This is due to failure to acquire language naturally, and therefore requires therapy or and linguistic and communicative exercises to activate their mental language and stir their cognitive abilities among others. This theory aids children’s understanding and

learning of words, phrases, and sentence combinations and how to transmit messages to others. Importantly, the Innate Theory is the key to the understanding of contextual use of language during communication; that is, how language is rightfully applied in different social situations and environments.

3. Mentalist/ Cognitive/ Semantic-Cognitive Theory: The caregivers of children with developmental disorders including autism (i.e., the clinicians, educators, and parents) have been applying the Semantic-Cognitive Theory to understand children's strategies while gaining new information. A child with autism definitely needs their caregivers to adjust or reduce sentence complexity, the information volume in the sentence, and the rate of what is said in a sentence. These variables influence what the autistics understand in a conversation or sentence. As a result, only caregivers with understanding of this theory may simplify their sentences or combine them with other cognition-tasking devices (such as wordless picture books) to ensure that these children slowly process lesser information for better understanding.

4. Social-Pragmatic Theory: Understanding this modern psycholinguistic theory may make language and communication less cumbersome in various ways. These ways include engaging children in social games (like peekaboo) which have been identified as suitable for turn-taking in communicative acts where parents, educators or clinicians speak and anticipate similar response from the children; and similarly in reading books. Essentially, caregivers can enhance linguistic and communicative competence of the autistics in general by approaching it from a social-communicative and contextual viewpoint (see Higgins, DeBenedictis & Mack, n.d.). This further implies that Social-Pragmatic Theory can help to consider grammar, syntax, and discourse system of the autistics while the focus is on the pragmatic competence in L1, L2, or L3.

The above claims corroborate the idea that grammatical competence for instance does not equal to communicative competence as many linguistic expressions may be uttered without explicit referent, and an example is "*My flight will arrive at 6:00 p.m.*" which may be an indirect request by the speaker to be picked up from the airport (Akmajian et al., 2008). This means that successful communication largely depends on recognition and understanding of speaker's intention (Tomasella, 1999; 2000; Akmajian et al., 2008) and not only to understand the grammar, or by making expressions to be cohesive and coherent. The above

views establish that Social-Pragmatic Theory is primal to linguistic and communicative competence despite that it may even be tasking for the neurotypical developing children to figure others' intention out themselves. However, the caregivers of children with ASD will benefit from the theory as far as the caregivers are conscious that these children need to use language or utter certain expressions in a socially appropriate manner (see Akmajian et al., 2008).

3.8 Summary

In this chapter, the focus was on the theoretical and conceptual frameworks on which this study is anchored. The chapter explained Theory of Mind (ToM) and its expanded form: Explicit and Implicit Spontaneous Theory of Mind in ASD. The former describes deficiencies in reasoning concerning mental states (though social communication has developed before the emergence of ToM in typically developing children), and its contribution has helped to explain and understand the core symptoms of ASD (i.e., deficits: in empathy; social skills and communication; in pragmatic language, and imaginative play (e.g., Sodian, Schuwerk & Kristen 2015). However, some decades later after the deployment of ToM, researchers found that no single theory can adequately account for autism and its symptoms (Tager-Flusberg, 2007), so the emergence of explicit and implicit spontaneous ToM. This serves as extended research on mental-state, which focuses on understanding social contexts naturally to investigate and explain processes of spontaneous information in the human mental-state from the perspective of body gestures, faces/ gaze/ eye-movement/ eye-tracking, or voices (e.g., Klin, Jones, Schultz & Volkmar, 2003; Sodian, Schuwerk & Kristen, 2015).

In addition to the above-mentioned theories, this chapter also explained and contextualised the Disrupted Connectivity Hypothesis (DCH) of ASD. This explains core clinical symptoms (irrespective of being monolingual, bilingual or multilingual). DCH draws extensively from biological system and function of human brain. The chapter also situated the research within some theories of psycholinguistics (i.e., Behaviourist Theory, Nativist or Innate Theory, Cognitive Theory and Social-Pragmatic Theory). This chapter also adopted and explained neurolinguistics as a conceptual framework, thus lends credence to the understanding of language impairments, brain system, language processing, and language acquisition. All theories discussed in this chapter were adopted to explore arguments on ASD, establish the

context of the problem, and aid their understanding in relation to deficits or impairments of among the bi/multilingual autistic children and their linguistic and communications competence. The next chapter discusses research methodology.

CHAPTER FOUR

RESEARCH DESIGN AND METHODOLOGY

4.1 Introduction

In the previous chapter, discussions were made on theoretical framework adopted for the investigation of linguistic and communicative competence in relation to ASD. The focus of this chapter is to explicate the research design that takes triangulation approach, and the chapter further includes method of data collection instruments and processes, the population and sampling methods, the research paradigm, data analysis procedures, among others. This chapter also elaborates issues of trustworthiness, validity and reliability, as well as ethical consideration (Bertram & Christiansen, 2014) and how they are adopted in this research. In addition, this chapter discusses data analysis procedures and the limitations of the study.

4.2. Method of Data Collection

This section focuses on the method employed for collecting data in this study.

4.2.1 Research Paradigm and Design

Research endeavors are sets of numerous activities, which are systematically synchronised to arrive at a logical conclusion. Seale, Gobo, Gubrium and Silverman (2008) stated that many considerations need to be sought in order to have a good quality research as research goes beyond specific philosophical or theoretical stance alone. Therefore, research paradigm and design are core aspects of the methodological approaches as they help in having findings which are credible after judgement (McMillan & Schumacher, 2010). To Creswell (2005; 2012), research design is a directory to how data can be collected, analysed, as well as their interaction within a chosen research paradigm. As a methodological process, a research design (through research question) is a reflection of what type of data to be collected and ways of collecting it (Henning, van Rensburg, & Smith, 2004).

Meanwhile, this research followed pragmatic research philosophy. Pragmatic research philosophy in this sense accepts numerous but different means in which research may be undertaken and interpreted with the notion that a complete picture with multiple realities may not be well represented using a single perspective (Saunders, Lewis & Thornhill, 2012). In most cases, research questions are determinants of choice of pragmatism thus allowing for the combination of interpretivism and positivist philosophical approaches in a single research

undertaking. This implies that pragmatism can be deductive and inductive in approach and being subjective and objective ontologically (Dudovskiyo, 2018).

This study involves mixed methods in which qualitative and quantitative approaches were chosen for data collection. The mixed methods research involves quantitative and qualitative methods, and both were adopted for this study. Cresswell and Plano Clark (2011) asserted that quantitative and qualitative methods are essential data collection strategies that can be sequentially or concurrently employed to engender empirical evidence relevant for providing answers to any particular research question. The rationale behind the choice of this method was that the method can accommodate and account for what a single-method design cannot do in terms of understanding and providing answers to the research problem.

For this study, an embedded or nested design was adopted to ensure that both qualitative and quantitative data were gathered. The quantitative data was supplemented with the qualitative data whereby some respondents were interviewed about the phenomenon under study. The qualitative data were also extended to classroom observations whereby the speech acts of individual autistic children in the classroom and their educators' teaching strategies were observed. Meanwhile, a separate questionnaire was designed for educators, and another separate one for parents (see Appendix C). The questionnaire designed for parents have some adaptations after permission from the owners has been granted. Each set of the questionnaires was aimed at eliciting quantitative data from educators and parents as applicable to them. The qualitative aspect of the study involved interviews with key informant like educators, clinicians and speech therapists (see Appendix D). The presence of these participants in this study made the whole data gathered to be robust, and it also helped in finding deeper answers to the research questions. Essentially, the adoption of multiple approaches for data gathering was to enlarge the number of research respondents, and also to enrich the information for the study.

4.2.2 Quantitative Design

Quantitative research design as another dominating research approach seems to be in a sharp contrast with qualitative approach as it focuses on numbers and not words for describing one's feelings, experience, emotion etc. In quantitative research technique, collected data can be classified, sorted and measured in order to arrive at some findings. In other words,

quantitative research design has numbers and calculations, while answering "how many?" and "how often?" questions. Bryman and Bell (2015, p. 160) opined that quantitative research technique entails "…the collection of numerical data and exhibiting the view of relationship between theory and research as deductive, a predilection for natural science approach, and as having an objectivist conception of social reality". Meanwhile, the relationships between statistical methods adopted for a study, and the variables, which are numerically measurable, are primarily examined (Dudovskiy, 2018).

Importantly, collection of data quantitatively includes employment of structured data and random sampling instruments, and the findings can be summarised, compared and generalised (Dudovskiy, 2018). One of the main advantages of quantitative data collection technique is the accuracy of information that can be obtained (Kumar, 2014). However, this type of research design cannot account explicitly for the human's worldview, feelings, emotions etc. For this study, a separate questionnaire was employed to elicit responses from the parents, and the educators of children with ASD. There were 59 items in the questionnaire designed for parents, and 32 items were in another designed for educators. The questionnaires were with a range of options in Likert scale format and each question (or a set of questions) was linked back to a particular research objective thus confirming Vasudevan's, (2016) assertion that in order to serve its role, a questionnaire needs to be linked to research objectives. The distribution of these questionnaires followed a random sampling of educators/ teachers that have been teaching these children with autism for at least 2 years; the questionnaires were distributed to both parents and teachers at selected schools where observations were made. The questionnaires consisted closed-ended questions (from which simple options can be selected from) and some were based on DMS-V criteria of 1= *Often*, 2= *Sometimes*, and 3= *Never options*; some ranged from *strongly agree, agree, neutral, disagree and strongly disagree*; and some were simple *Yes* and *No* options. Similarly, some parts of the questionnaires were open-ended, and the participants were required to respond using their own words.

Moreover, some aspects of the questionnaires were adapted from some widely used autism-related diagnoses/ intervention and assessment tools. These tools were design to capture the nature of behaviour and social communication in general. Only relevant aspects were adapted and modified with permission and/ or acknowledgements. The tools include: the ADI-R

(Lord et al., 1994), the Parent Interview for Autism – Clinical Version (Stone et.al., 2002), the First Year Inventory (Reznick et al., 2007), the Communication and Symbolic Behavior Scales Developmental Profile Caregiver Questionnaire (Wetherby & Prizant, 2002), the CARS-2 Questionnaire for Parents or Caregivers (Schopler et al., 2010); and The illness perception questionnaire (IPQ) and its revision (IPQ-R), (IPQ; Weinman et al. 1996; Moss-Morris et al. 2002; Mire et al. 2017). Part of the questionnaire covered the demographical details of the parents; nature and places of diagnosis; number of languages employed to raise the autistic children at home among others. Based on the belief that the educators are more knowledgeable; some questions included the cognitive bases of autism (e.g., whether below-average IQ poses learning difficulties to the autistic children or not; the nature of ToM). Others included the neurolinguistic bases of autism (e.g., language impairment and its relation to brain functionality and processes; disruption in Broca's area, angular gyrus, insular cortex or Wernicke's area of brain and its contribution to challenges of linguistic and communicative competence of autistic children) etc.

For this study, the questionnaires were distributed physically to the participants and collected when they were ready. The questionnaire for parents was in English and isiZulu (see Appendix C). Some parents opted for the English version of the questionnaire while others answered the isiZulu one. A research assistant was employed to ensure that parents understood questions well before answers were provided. Due to COVID-19 and its effect on education of many countries, 4 special schools were involved, two of which had children with other disabilities other than ASD. Altogether, (n=16) educators and (n=35) parents were administered and answered separate questionnaires (see Annexure B) in order to reflect their knowledge, language and communication practices, and caregiving activities towards autistic children in their care. Also, perceptions of participants and their daily teaching and learning processes were investigated by the researcher through observations, and interviews.

4.2.3 Qualitative Approach

As an aspect of this study, qualitative research approach focuses on a human subject, and helps to gain deeper understanding of the research problem being studied (Hammersley & Atkinson, 2007). Qualitative research approach was given preference when traditional quantitative research design could not account for people's feelings and emotions (Dudovskiy, 2018). Accounting for such feelings and emotions involves a number of social

phenomena. Polonsky and Waller (2011) stated that qualitative data may include spoken and printed word, captured vision, images, different media forms and structures. Within qualitative approach, research contexts as well as participants are described richly. This, according to Silverman (2010), suggests giving life accounts and interpreting participants' stories. Qualitative approach to research also involves taking naturalistic means to make sense of phenomena being investigated as well as research subjects' attribution of meaning to such issues (Denzin & Lincoln, 1994; Akinyeye, 2015). Furthermore, Denzin and Lincoln (2005, p. 3) described qualitative research as a fixed activity that is identified with the world as being observed with the aid of interpretive material practices which entail using an approach which is also interpretive materialistic to the world.

Similarly, Creswell (2007) added that qualitative research is interpretive and natural in its bid to seek world meaning which arises from how groups and individuals perceive human social problems. Social problems are not individual problem alone, but it may touch a larger community or the whole world. Meriam (1998) also corroborated the above notion that qualitative research involves understanding people's ways of interpreting self-experiences, worlds and their attributed meaning regarding these experiences (also see Simpson, 2015). Meanwhile, doing qualitative research is no doubt making a deeper enquiry into social problems, and it involves obtaining views and opinions in natural contexts in order to reflect peoples' daily lives. In addition, qualitative study is about human subjects, human activities (Richards, 2013) about which understanding, explanation, exploration, discovery and clarification of situations, beliefs, experiences, values, attitudes, and feelings can be offered. This implies that qualitative design approach is inductive but based on deductive logic; non-sequential; non-linear, emergent and flexible in its operationalisation. People are central to qualitative research as they are the suppliers of information and from whom open enquiries are collected and explored (Ntombela, 2019). The downside of qualitative approach includes lack of generalisation; relying on researchers' subjective interpretations and lack of duplication of the interpretations by others (Vaus, 2002).

For this study, human participants who are naturally and actively engaging autistic children in one way or the other at home, school or clinic were involved. This qualitative approach serves as a means to achieve in-depth understanding of linguistic and communicative competence in social-communication of bi/multilingual children with ASD through information from their parents, educators and speech therapists and clinicians. These

undertakings involve social world experiences of these participants who offered regular but specific services and first-hand information to foreground diverse realities of what children with ASD at home, school and other places such as clinic. The main data collection instruments adopted under qualitative design are semi-structured interviews, and observation.

4.2.3.1 Interviews

This is a qualitative research method that focuses on exploring perspectives of respondents on a certain idea, or situation through intensive interview (Boyce & Neale, 2006); or in another words, interviews are suitable for data gathering in relation to teaching and learning process whereby feelings, behaviours, thoughts, and beliefs of participants are considered (Punch, 2009). This is not applicable to only the teaching situation but also in most cases whereby people are required to express themselves for the purpose of data collection in any qualitative study. Principally, interviews were used to directly obtain information that cannot be explicitly observed from participants (Patton, 1980; Britten, 2006; Marshall & Rossman, 1999), or that information that cannot be quantitatively accounted for. Interview largely employs receptive media in different forms to obtain information through verbal (spoken) and non-verbal or gestural / body language communications (Cohen et al., 2011). Similarly, Jones (1985) asserted that issues pertaining to reality of a given topic in interview process will entail asking interviewers their views without interviewers' influence. Interviews conducted in this study aided participants to reveal details about issues related to social details about issues related to social communication, linguistic and communicative competence of children with autism.

The interviews involved probing into a phenomenon in order to secure detailed information from the interviewee's perspectives. To Kumar (2004), an interview is crucial to qualitative study as participants are best positioned to describe in their own words self-experiences and emotions concerning a situation. The main advantages of interview are the ability to obtain detailed information and researcher's opportunity to be in control of primary data collection process, and to immediately clarify any issue (Dudovskiy, 2018) while conducting complex and sensitive phenomena (Kumar, 2014) though to a certain degree many interviewees may avoid intense probing. The main disadvantage is time consumption and hardship in arranging for the best time (Dudoyskiy, 2018). There are three major forms of interview: structured, unstructured and semi-structured. Semi-structured interviews have elements of both

structured and unstructured interviews. This form of interview allows a set of the same questions to be asked and answered by interviewers and interviewees respectively while other questions might be asked as interview progresses to expand and add clarity (Dudovskiy, 2018).

This study employed the semi-structured in-depth interview method that contained a list of open questions that targeted at eliciting responses from their lived experiences pertaining to ASD as well as linguistic and communicative skills of children with autism. The educators, the speech and language therapists, and the clinicians formed the interviewees and the questions posed to them differed in some instances (see Figure 4.1 for the participants' distributions, and Appendix D for questions). This is essential as part of the data collected associated with teaching and learning in formal education context, and whereby questionnaire and interviews were designed for educator, in addition to classroom observations where both educators and their learners with ASD were examined. All interviews were conducted in English language. Semi-structured interview was chosen as it allows social interactions between interviewer and the interviewee in a bid to gain access to personal experiences, information or views about a social phenomenon. It also offers freedom to ask for more information, clarity or response where needed (see Maree, 2007). Similarly, semi-structured interview usually ensures sufficient data collection that can be easily linked back to research questions. This form of interview also further buttresses certain activities observed or what is not explicitly understood. Meanwhile, designing a semi-structured interview requires having themes (or research questions) of the research in mind in order to obtain precise, adequate and open responses from the respondents (MacDonald & Headlam, 2009; Rusangiza, 2016). In this study, the research instrument including the semi-structured interview was thematically organised as informed by each research question. All the participants were made to understand the purpose of the interview as well as the questions, and this made the whole exercise interesting and not frustrating.

The semi-structured interviews included open-ended questions, which were asked formally, and during the course of the interview led to other questions. These processes principally aided the collection of information from personal perspectives of the participants. This reinforces ideas that "interview suggests an exchange of stances between two or more people on a topic" (Kvale, 1996, p. 14). In addition, the semi-structured interviews helped to obtain extended answers to other questions other than the main ones already planned for. In this

study, each participant (educator, speech therapist, and clinician) was engaged at a time under conducive and safe environment, and thereby made the interviewees to express themselves freely without disruption. This served as a motivation which in turn led to collection of data with precision and trustworthiness in a process that involved transfer of pure information (Cohen et al., 2011; Akinyeye, 2015).

Most of the interviews for the educators were conducted before the lesson observations but after communications and appointments had been established with each interviewee. Some criteria were employed to recruit the speech therapists (n=4) and the clinicians/ pediatricians (n=4) were residing and working in each of the research sites (that is, Durban, Pietermaritzburg, Richards Bay and Empangeni). For the educators, the criteria were education qualifications (Diploma at least), and two-year teaching experience with children with ASD or related neurodevelopmental disorder(s). For the speech therapists, and clinicians/ pediatricians, the criterion for their selection was mainly having two years of work experience with autistic children. Furthermore, the interviews were mostly conducted in the office of each participant but at their convenient time. This setting created a relaxed atmosphere and the required mood (without noise, or disturbances) which altogether amounted to evocation of relevant information (overt and covert) concerning linguistic and communicative competence of children with ASD in KwaZulu-Natal. The above setting is sequel to the prior arrangement in which the participants chose their best times and days for the interview. The setting was essential for the conduct of the interviews because an interview helps to produce knowledge and reasoning elicited from participants. In addition, these participants within the interview can recall, withdraw and expand ideas or thoughts unlike other data that are prone to manipulation (Kvale, 1996). The interview participants were also allowed to express their opinions without restriction. This was done to avoid presumption and assumption of any kind.

For the teachers and speech therapists, the interviews covered some aspects such as: (i) possibility of ASD prevalence in one culture over another; (ii) bi/multilingualism for teaching children with autism; (iii) disruption in brain connectivity and its effects on the linguistic and communicative competence of autistic children; (iv) common challenges experienced by autistic children in terms of word use and sentence structure; (v) teaching/ linguistic enhancement methodologies employed to impart knowledge to the bi/multilingual autistic children among others. In addition, the speech clinicians were interviewed based on the

following: (i) the prevalence rate (ratio) of ASD per 100 children; (ii) methods employed to detect and diagnose ASD among children; and (iii) common features among ASD children diagnosed so far among others. The views obtained from these semi-structured interviews also helped in taking worthy notes on class activities including teacher-learner interactions during observations. With the nature of information obtained, data were subjected to triangulation, and as agreed by all participants, the audio-recorded information was transcribed.

Concerning reflexivity, the researcher maintained formal relationships with all the participants especially those interviewed. The researcher ensured that the rapport established with them during the data-gathering period had no influence on their response to each question posed to them. While embarking on this study, trustworthiness, honesty, and reliability were maintained to ensure quality data (including the interviews). Essentially, no favouritism was secured in anyway, and no easy access, undue interventions, and special privileges from any of the participants. The recruitment of the interviewees and other participants was based on their relationship with autistic children, their expertise, and knowledge about the study. While the participants asked the researcher to explain certain concepts they did not understand in some questions, reflexivity was also maintained as explanations were only given to aid understanding of those questions and not to influence the given responses.

4.2.3.2 Classroom Observation

Observation is a research technique in which the researcher keenly examines what happens in a particular environment, and it is a data collection method under qualitative research paradigm that has ethnographic design. Lankshear and Knobel (2010) viewed observation as a data generation method that entails evaluation of what is happening in a particular area or environment. Kumar (2014) found observation as systematically and purposefully watching and listening to an interaction as it unfolds. Kumar further explained that one could get more understanding and clarification of a phenomenon through responses and behavioural patterns being displayed by the participant being observed. Similarly, observation, to Simpson and Tuson (2003), means an act of thorough, constant, analytical viewing and noting of people, their behaviours, certain events, artifacts, as well as setting of naturally occurring contexts.

Maxwell (1996) reiterated that research investigation done through observation makes inferences easier on actions and reactions observed. Furthermore, Nunan (1989 as cited in Akinyeye, 2015) stated that natural contexts where behaviour occurs need to be investigated in the natural contexts.

As a non-participatory observation, this study involves schools; and observation technique is appropriate for collecting onsite information (as they unfold naturally) in the classroom. In other words, teaching and learning processes were keenly observed as both teachers and learners with autism engaged in those processes and activities. Henning et al. (2004) asserted that in a research setting, such observation is not a mere collection of information, but involves people's actions and knowing these actions daily. Similarly, Bertram and Christiansen (2014) mentioned that observation in-site context could be taking place where conversations, interactions and behaviours of participants are being observed (Bloor et al., 2006). Observation therefore offered a means to first-hand information and thereby made data for this study more robust, and provided ways of tackling hard and uncommon phenomena that proved to be uneasily approached (Akinyeye, 2015, p. 123). Through class observation adopted for this study, children with autism and their educators were observed mostly during teaching and learning process for 6 weeks between October to December, 2020. The weeks were spent to reach the four participating schools, and in total, 10 classrooms and 15 teaching periods were observed. A checklist for the classroom observations is in Appendix D. Notably, the classroom observations broadened the understanding of teaching strategies adopted by the educators, and the speech acts of the learners with ASD in relation to social communication and linguistic and communicative skills of children with autism. Similarly, class observation helped to understand other than teaching and learning activities, the relationship between teachers and learners with ASD during each teaching period. Through class observation, teachers' responses during interviews were also subjected to evaluation and validation. Specifically, observation revealed the nature of teaching and other classroom engagements with these children especially the linguistic and communicative techniques/ skills/ activities employed in the class to teach the students about language and communication.

In addition, the level of linguistic comprehension in L1 or L2 or L3 (this was mainly subjected to responses of the students in the class) as well as linguistic and communicative competence that includes four broad categories: linguistic, sociolinguistic, discourse, and

strategic competence were observed during the learning and teaching processes. In order to achieve the above, day-to-day record of teachers' engagement, note-taking and audio recorder were employed. As permission was granted, the recordings were specifically done during the teaching and interactions with the learners with autism, and thus helped to arrive at comprehensive information concerning participants' daily communicative practices and competence. The above reinforces further that everyday affairs issues found at workplaces are also common focuses of qualitative research design, and this design interprets ways in which factors or interventions result into a particular consequence (Maxwell, 2005; Akinyeye, 2015, p. 111).

Furthermore, observation, as a method of data gathering, has its own limitations, and according to Kumar (2014), people's or participants' knowledge of being observed serves as the main factor as they tend to change their behaviour which may result into positive or negative result depending on the context of such observation. This change during observation is labelled a Hawthorn effect, which ultimately may bring distortion or bias even when the researcher is not at initial stage being impartial. In addition, Bertram et al. (2014, p. 92) maintained that the researcher's presence (in research setting) might affect data that is recorded. To Labov (1973), there is another shortfall of observation known as *observer paradox* in which reality tends to be misrepresented due to subjects' behavioural change wittingly done for being under observation. It is understandable from Labov's (1972) view that sociolinguistic related research employs observation of people's behaviours but not overtly done. Paradoxically however, observation done covertly may not give enough useful data, therefore, observation needs to be systematically done. In this study, both Horthorn *effect* and *observation paradox* were reduced by making multiple class observations during different lessons. This created familiarity with children and their teachers, and eventually made them act naturally. Another setback of observation method is different interpretation from different observers on a particular situation. That may occur because of varied methodological approach to recording the event or incomplete capturing of scenes as the events unfold (Ntombela, 2019). Another case may occur when enough notes were taken but physical interactions or exchange of notable actions were missed.

For effective observations, the research purpose was explained to the principals of the participating schools during the first visit to the schools, and the principals helped in giving

necessary explanations to all teachers involved. The teachers equally helped to obtain their timetable, and classrooms were visited thereafter. In each of the 4 schools, observations were done for 6 weeks, covering 10 classrooms and 15 lessons. Following Communication Matrix (Rowland, 2012), a guide was designed in the form of a checklist as shown below. Importantly, the Matrix has solid research background and it was originally designed for speech-language therapists and educators, and it accommodates forms of communicative behaviour, and alternative forms (such as sing picture systems, electronic devices, sign language); pre-symbolic communication (like eye gaze, body movements, facial expressions, gestures, body movements, and sounds); and communication in any typical form. The Matrix has been widely used in both home and school settings, and it has a potential to guide observation and understanding individual children's socio-pragmatic profile as they develop, and to provide a portrait of their communication skills (Rowland, 2012). The guide is as follows:

1. Type of language or communication deficits found among children with autism in the class.
2. Linguistic and communicative techniques/ skills/ activities employed by educators in the class during teaching of any lesson, or teaching language and communication.
3. Level of linguistic comprehension in either of L1, L2, or L3 or in all (this may be assessed if learners are verbal or non-verbal but without auditory impairment).
4. How well do the children with autism speak, read, write, and respond to their teachers?
5. The linguistic and communicative competence that includes four broad categories: linguistic, sociolinguistic, discourse, and strategic competence observed among children with autism.

This checklist is in accordance with linguistic and communicative items provided in Communicative Matrix. These items include what the child does to show or say s/he: i. Refuses or Rejects Something; ii. Requests More of an Action; iii. Requests a New Action; iv. Requests More of an Object; v. Makes Choices; vi. Requests Objects that are Absent; vii. Requests Attention; viii. Shows Affection; ix. Greets People; x. Offers or Shares Things; xi. Directs Your Attention to Something; xii. Uses Polite Social Forms; xiii. Answers "Yes" and "No" Questions; xiv. Asks Questions; xv. Names Things or People; xvi. Makes Comments.

Each of the above was examined in reference to communicative acts which include one or more of *body movement, facial expression, visual, simple gestures, conventional gestures and vocalisations, concrete symbols, abstract symbols, and language use.*

Aspects of linguistic and communicative competence such as discourse competence, pragmatics competence, strategic competence and grammatical competence, were keenly observed during the teaching and learning processes in the classrooms. Furthermore, educators' classroom teaching methodologies were observed in order to gain perspectives concerning their pedagogic practices in the classroom, number of languages being deployed during teaching and learning sessions, and how all these influence learners' communication skills and their academic performance. Observing the teachers in this context also helped to note learner-teacher interactions and learners' involvement in the lesson from the outset of each lesson until the end. The class observation additionally focused on the strategies employed by the teachers to improve in general, the social communication, or specifically, the linguistic and communicative competence, as well as academic performance of learners with autism in the schools were observed.

Essentially, the expected teachers' strategies hinged on sharing of joint attention, eye contact, pragmatic and discourse cues, turn-taking among others. As much as observation requires perceptual and analytical skills—and not just a predictable exercise—there was intensive and extensive application of those skills which at the end helped in gaining full understanding of various events during the observations (Richard, 2003). Similarly, Richard (2002) contended that some observers might actually counter-act reality while observing. This suggests that observation in this context is not merely being in classrooms, but also to help in gaining thorough understanding of teachers' strategies employed for teaching the bi/multilingual children with autism spectrum disorder (ASD). This also covered teachers' perception about the nexus between ASD, language and communication, and academic performance of the autistics.

Furthermore, during the observations, learner-teacher interactions, relationship and responses of leaners to questions, among others, were recorded. The audio recorder aided the capturing of all conversational activities during each lesson, and other physical behaviours, which might help in the analysis of responses, were also noted. All these gave detailed descriptive assessment of various events to arrive at a holistic meaning within the context of this study.

In line with the qualitative technique adopted, the participants were allowed to raise opinions, or act during the interviews and observations (Silverman, 2010; Akinyeye, 2015, p. 124).

Additionally, language and communication are core tools to deliver lesson, these were closely observed from the perspective of learners and their teachers in all lessons observed for each day without interruption in any manner. This aided extraction of relevant aspects of the lessons that related to social communication, linguistic and communicative acts, which are also essential for data analysis. The modus operandi of the observations also included observing autistic children at different phases of study as each school categorised them. Each class observation was carried out mostly based on the timetable. In order to avoid disruption of any form during each teaching and learning period, the recorder was placed closer to the teachers while the main observation went on with note-taking to complement the audio-recording.

4.3 Research Sites

This study was carried out in 4 major locations in KwaZulu-Natal. These places were Pietermaritzburg, Durban, Richards Bay, and Empangeni. The choice of these locations was informed by their unique characteristics such as large heterogeneous population, and presence of special schools where ASD also receives attention. These schools which have been existing for at least 5 years. This province with 11 289 086 inhabitants has the second largest population in South Africa after Gauteng with 15 176 115 people (SA Statistics, 2019). As at 2011, close to 8 million people in KZN alone had isiZulu as their L1, out of the 11.5 million people that were using the language as their L1 in the whole country (Statistics SA, 2011). Observably, the majority of people in KZN can speak two or more languages. The majority of the population lives in Durban and Pietermaritzburg, and they are mostly Zulus (with Zulu culture, and isiZulu as L1). Similarly, the majority of the people at these research sites are lower/middle-income earners, but they are not experiencing the same late diagnoses difficulty like those in the rural areas. All these factors made the research sites preferable than others. Figure 4.3 below shows the map of the research sites.

Figure 4.1 A map of KwaZulu-Natal Province of South Africa Showing Durban, Richards Bay, Pietermaritzburg among other notable places (Source: www. https://za.pinterest.com/pin/510736413961220057/?lp=true)

There are a number of special schools where autism is being attended to in these research sites though mostly privately owned, they have a reasonable number of leaners already diagnosed with autism. In addition, all the schools were under the Department of Education in KwaZulu-Natal, therefore, enjoying recognition. The largest non-governmental association on autism: Autism South Africa also enlists all the selected schools as those educating children with autism. This may be part of what made these schools to have children with autism from different localities and social backgrounds. The names of the schools are withheld in adherence to the principle of confidentiality under research ethics.

4.3.1 The Schools

For this study, 3 schools (in Empangeni, Durban, and Pietermaritzburg) and 1 ASD centre in Richards Bay were involved. The names of these schools and other participants from these schools were not mentioned, pseudonyms were used instead. Importantly, the schools were selected due to the accessibility of children with ASD. The school authorities and the participants were told the purpose of the study and their consent was obtained without any inducement or force. These schools and 1 ASD centre had uneven number of learners and educators which influenced the sample size. Specifically, the nature of this research and the data collection procedures such as, employment of questionnaire, interviews, and classroom observations were made known to the school authorities and the participants. The participating schools mentioned that the main reasons for their participation include being committed and acceptance of any form of research that individuals with ASD and other related disorders may benefit from, and that may advance knowledge on such disorders. Some schools that rejected participation mentioned COVID-19 and parents' negative disposition to observing their children with ASD at their school as the main reasons for their non-participation. A period between October and December 2020 was spent for data collection.

4.4 Sample and Sampling Technique

Non-probability sampling methods were employed in this study, and as a tradition, non-probability sampling is normally applied to qualitative research (Abedsaeidi & Amiraliakbari, 2015). In addition, sampling methods such as quota, convenience, and purposeful are common to non-probability sampling procedure (Naderifar, Goli & Ghaljaie, 2017). The research participants were therefore recruited using purposive and convenient sampling. Combining these sampling methods was necessitated by the impact of COVID-19, which made recruitment of research participants and gaining access to a larger number of them more difficult.

The selection of relevant school or centre and the participants (the parents, the educators, the speech therapists and the clinicians/ pediatricians) was done based on their relevance and the possibility of supplying valid information on the subject-matter (Elo et al., 2014). For parents/guardians, the criteria for their selection were based on being active caregivers for at least 2 years to a child who has been diagnosed with ASD; while the educator must have been teaching/ educating children diagnosed with ASD for at least 2 years. Also, the speech

therapists, and the clinicians/ paediatricians must also have been working with autistic children for at least 2 years. All participants for this study have a connection with children with ASD, and involving in caring for and/ or educating children with ASD, working on (social) communication of children or individuals with ASD; and some are with information, expertise and knowledge on specific areas that involve linguistic and communicative practices of these children.

4.4.1 The Participants

The participants of this study (the parents, the educators, the clinicians/pediatricians, and the speech therapists) have been stratified based on different classes or group they were drawn from. In total, 60 parents received questionnaires to participate in the study, but due to COVID-19 pandemic and its effect on people, 24 of them opted out citing COVID-19 related issue like having symptoms of COVID, fear of being infected, and some mentioned the need to strictly observe social distancing. Eventually, 36 of the 60 parents completed and returned the questionnaire, however, responses on Part A of one of the returned questionnaire were invalid due to multiple answers; therefore, 35 valid copies of the questionnaire were captured and analysed in Part A of the questionnaire designed for the parents. In addition, sixteen (16) educators participated in the quantitative aspect of this study (i.e., they completed the questionnaire designed for the educators). Moreover, eight (8) educators, four (4) speech and language therapists, and four (4) clinicians/ pediatricians who had rendered services to children with ASD for the past 24 months or more also participated in the qualitative aspect of the study through interviews. The number of the participants of the qualitative aspect was smaller as interpreting meanings rather than numbers served as the focus (see Maree, 2007). Similarly, Corbin and Strauss (2015) argued that in qualitative research, circumstance as well as conceptions is valuable than quantity. Table 4.1 below shows the data instruments, the number of the participants in each category, the rationale for choosing each instrument, and their link with research questions.

Types of Data Instrument	**No of the respondents**	**Rationale**	**Link to Research Questions**
Questionnaire (for the parents)	36	To gather information on varied behavioural including linguistic and communicative practices and skills exhibit at home setting. To elicit information from parents as regards the choice and usage of one or more languages to raise their autistic children. The	The data gathering instrument helped to answer research question 1, 2, and 3. Some aspects of the

		questionnaire also probes the satisfaction received from other place such as school, hospital. And from the professionals working there.	questionnaire also gave insights towards answering research questions 6.
Questionnaire (for the educators)	16	To elicit response on speech acts and socio-communication practices in school setting. To seek information on how deficit in brain functionality and Theory of Mind may result in language and communication skills, and in turn affect academic performance of autistic learners.	The data-gathering instrument helped to answer research question 3, 4 and 5. Some aspects of the questionnaire also gave insights about answering research questions 6.
Semi-structured Interviews (for the educators)	8	To gather additional information based on the educators' experiences in the course of teaching and interacting with autistic children from in their class. To make inquiry about the impact which socio and linguistic environments have on autistic children and their overall performance in class.	The data-gathering instrument helped to answer research question 1, 3, 4, and 5.
Semi-structured Interviews (for the Speech and Language Therapists)	4	To obtain information about the professional services being rendered to autistic children to enhance their communication. To ascertain the number of autistic children they have rendered services to and their cultural group. This is based on the assumption that these professionals render services to autistic children from diverse cultural backgrounds.	The data-gathering instrument helped to answer research question 1, 3, 4, and 5.
Semi-structured Interviews (for the Clinicians/ Paediatricians)	4	To get information about what they know about ASD in KZN, and their view about exposing one or more languages to autistic children. To obtain information about the prevalence of ASD in a culture based on the fact that they attend to autistic children/ individuals from different culture.	This data gathering instrument helped to answer research question 1, 3, and 4.
Classroom Observations	Period: 6 weeks. Schools involved:4 Classrooms visited: 10 Total number of lessons observed: 15	The rationale was to examine how autistic learners respond to learning and communicate with one another and their educators during the lessons. It was also to examine the teaching strategies employed by these educators, especially those relating to ways of enhancing behavioural, linguistic and communicative skills in their natural settings. It also inspired arriving at a model that may help caregivers' understanding of ASD and in rendering their services.	This data gathering instrument helped to answer research question 3, 5, and 6.

Table 4.1 Number of selected samples, reasons for their selection, and their link to research questions. Source: Author (2020)

Note: Total number of the participants is (60) comprising 36 parents, 16 educators, 4 speech and language therapists, and 4 clinicians/paediatricians.

Importantly, the research participants' real names were not mentioned and pseudonyms were used instead. This enables this study to comply with the ethical standard and aspect of anonymity mentioned in the letter of consent that each of the participants signed. The criteria or variables for their selection such as age, gender, qualifications, teaching experiences, are believed to play a crucial role in the process of analysis. All participants are bi/multilingual speakers, and isiZulu, Afrikaans, and English were mostly used while at schools, though with varying degree, and the choice and usage of these languages as medium of instruction depends on preference of each school and their educators.

4.5 Field Notes

In the course of data collection for this study, field notes were made to record some significant events or activities that are relevant to data collection. Bodgan and Biklen (2003) asserted that field notes involve documenting records of what happens at the research site during data collection. Field notes in this regard further validate data instruments for qualitative aspect of this research as what was seen, heard, perceived and experienced were recorded instantly at the research site or during a self-reflection on all activities or events that have happened especially in the classroom schools, during teaching, and interaction among learners with ASD. This process was used to strengthen other data sources (that is, the questionnaire and semi-structured interviews).

4.6 Validation of Data Collection Instruments

This section discusses how data instruments adopted for this study are validated.

4.6.1 Validity and Reliability

Validity is described as the degree at which accurate version of the world is created in research (Bloor et al., 2006, p. 147). Validity and reliability have been found as most vital aspects of survey research (Olsen, 2012). Similarly, Kumar (2014) argued that the reliability of a research instrument leads to achieving similar results when continually employed using similar conditions, and as such makes the findings of the study to proffer solution or valid

explanation to what is being investigated. In other words, the author maintained that validity as an instrument has the ability to measure what it has been designed to measure.

Also, Babbie (2007) stated that questionnaires as a tool of data collection need to be pre-tested by the researcher to ensure fault correction or content amendment especially items which participants may find hard to comprehend. However, the structural system (wording) of both interviews and questionnaires are essential for data validity. This is in line with Kimberlin and Winterstein's (2008) view that validity is in different form, and they include *construct validity, content validity,* c*riterion-related validity* and Cronbach's alpha has been widely used to ascertain whether the questions in the instrument are suitable and how much is the internal consistency. In this study, Cronbach's alpha was not used, however, clarity and easy comprehension of research instruments received primary concerns in this study, therefore, the questionnaire meant for some parents was translated into isiZulu, and all questionnaire items, interview questions, and class observation checklists were pretested through a pilot study to enhance the reliability and validity of the research instruments. This implies that the pilot study was conducted after the interview questions and questionnaire for the parents and for the educators were submitted to two experts (one statistician and a scholar in the field of autism research). While 5 items of the questionnaire designed for parents of children with ASD were found ambiguous and 2 were repetitive; 3 items of the questionnaire designed for educators were found ambiguous with 2 items repeated. No changes were made to the interview questions designed for the clinicians/ pediatricians, and speech therapists but 2 items from interview questions designed for educators were also corrected. All necessary corrections were made for their content validity before being finally adopted. This implies that all research instruments used in this study were checked for clarity, ambiguity, adequacy and level of their coverage of relevant aspects of the research questions and duration of completion (Cohen, Manion, & Morrison, 2011).

The classroom observation checklists include basic psycholinguistic performances and relevant communication skills stated in Communications Matrix (Rowland, 2012) while some items of questionnaires for the parents were adapted from widely used data instruments such as the ADI-R (Lord et al., 1994), the Parent Interview for Autism – Clinical Version (Stone et al., 2002), the First Year Inventory (Reznick et al., 2007), and the Communication and Symbolic Behavior Scales Developmental Profile Caregiver Questionnaire (Wetherby & Prizant, 2002). Others are: the CARS-2 Questionnaire for Parents or Caregivers (Schopler et

al., 2010); and The Illness Perception Questionnaire (IPQ) and its revision (IPQ-R), (IPQ; Weinman et al., 1996; Moss-Morris et al., 2002; Mire et al., 2017. These were found adequate with focus on linguistic and communicative competence that includes four broad categories: linguistic, sociolinguistic, discourse, and strategic competence.

Apart from the above, the researcher further ensured the correctness of interview data collected, member check also known as respondent validation was carried out by sending the transcript of the interviews to the participants for confirmation. This was conducted to ensure member checking which offered opportunity for the interviewees to verify accuracy of the interview interpretation and to contest perceived misinterpretations but which in turn helped to maintain reliability (Denscombe, 2003; Bell, 2005; Richards, 2009; Mears, 2012). Only two of the interviewees made few changes to their respective transcripts while others found their transcripts accurate. Essentially, questionnaires and observation were corroborated with the interview data (thereby leading to data triangulation) to ensure validity and trustworthiness. This is another process to account for data accuracy and this can be done through multiple research tools (Johnson, 1994).

4.6.2 Data and Methodological Triangulation

Denscombe (2010) explained that triangulation is seeing things from multiple perspectives by employing varied methods and varied sources of data or varied researchers in the same study. To ensure that findings from this study demonstrate data credibility, as well as its methods. Meanwhile, *trustworthiness* that is closely associated with quantitative research, and validity commonly used in quantitative research may raise level of confidence of the research findings that have varied methods of data collection (Denscombe, 2003). In addition, different strategies have been identified for maximising research trustworthiness and validity, however, triangulation has been top-notched (Denscombe, 2003; Becker & Bryman, 2004; Cohen et al., 2011; Robson, 2011; Creswell, 2014). Triangulation has two main components, they are: (i) data triangulation which relates to research whereby the same research question is viewed with more than one data source or method; and (ii) methodological triangulation which involves using more than a single approach to respond to different research questions in a particular study (Denscombe, 2010; Robson, 2011).

To ensure maximum trustworthiness and validity, this study employed both data and methodological triangulation. Furthermore, data triangulation enables a researcher to make sense of the world from different viewpoints (Bell, 2005), while methodological triangulation enables findings from both quantitative and qualitative research approaches to be synced (Robson, 2011) and thereby leads to comprehensive or complete understanding of what is being investigated – a result which either of the two research approaches cannot obtain (Creswell, 2014). In this study, educators, clinicians/pediatricians, language therapists, and parents of children with autism were recruited to achieve triangulation. In some occasion, the same questions were asked across these groups, or have close similarity with others asked in another group. For instance, the questionnaire for parents of children with autism has a section on communication matrix that is closely related to aspects of linguistic and communicative competence of children with autism asked in educators' questionnaire.

Moreover, the interview questions for speech therapists, clinicians/pediatricians also share some similarity. Essentially, this study achieved its methodological triangulation through the adoption of mixed methods. However, triangulation has been criticised for integrating both ontological and epistemological principles and has no way of combining both qualitative and quantitative approaches to investigate and understand social reality (Cohen et al., 2011; Bryman, 2012). Meanwhile, the choice of mixed methods in this study hinges on its practicability to get two or more research approaches integrated from data collection to data analysis and interpretation of data and not necessarily based on principles of ontology and epistemology (Edmonds & Kennedy, 2013). Similarly, theory is not the main focus of mixed methods approach but practical experience, therefore, mixed methods is helpful to triangulate this study findings and thereby justify their validity.

4.7. Ethical Considerations

This study pertains to human subjects, and thereby considered and obtained participant's willingness, knowledge and consent as it is unethical to obtain information from them without doing so (Kumar, 2014). Before, during and after data collection, the researcher identified and adhered to the participants' rights such as confidentiality, informed consent, anonymity, and usage of participants' personal data in line with the University of Zululand's ethical guidelines that include upholding research participants' rights who are directly or indirectly involved or affected by the study (University of Zululand, 2016). Ethics clearance

certificate with No. UZREC 171110-030 PGM 2018/512 was obtained (see Appendix 6). In addition, research approval letter from the Department of Basic Education, KwaZulu-Natal Province (Appendix 7) with directives that allowed the researcher to conduct research in the selected schools was obtained. The principle of informed consent was adhered to strictly as the research sought an informed consent from all participants purposely to ensure their free and voluntary participation. A written permission to carry out this research was also delivered to the heads/ the administrators of selected schools. In addition, for individuals and schools, participation was made mainly voluntary, and their right to withdraw at any stage of the data collection was explicitly made clear.

All the data instruments: questionnaires, lesson observations, and interviews were explained vividly to the participants, while a research assistant was recruited to translate a questionnaire designed for parents of children with autism from English to isiZulu for those whose did not clearly understand English. However, no vulnerable individuals were included in both data collection, data analysis processes and after the completion of the study. The right to anonymity was adhered to in order to secure the identities and personal information of research participants, and in most cases, aliases were used for both data analysis and data interpretation.

In accordance with research ethics of the University of Zululand (2016), and Human Science Research Council's demand (HSRC, 2018) and that at the end of a research, the right of sponsor, client, participant to ask for information from the researcher needs to be granted; the researcher promised to share the research findings with the participants/ respondents. Similarly, to ensure that the participants felt safe, the researcher undertook to account for the protection of the anonymity of the subjects. Furthermore, the researcher ensured that data were processed mainly for the purpose of this study.

4.8 Data Analysis Procedures

This section explains both qualitative and quantitative analyses carried out separately but were later integrated in the interpretation of results section. This implies that analyses were carried out on both qualitative and quantitative research data from obtained parents and educators of children with autism, as well as from clinicians/ pediatricians and speech therapists giving specific care or services to children with autism. Katuu (2015) asserted that

through analysis of data, themes and findings can be identified, summarised and interpreted and presented. Furthermore, performing data analysis entails transforming and modelling the data – which is a process aimed at identifying relevant and usable information—purposely aimed at supporting decision making and reaching conclusions. This process helps to have a total comprehension of what research questions entail, and therefore produce valid and rich data (Creswell, 2014).

4.8.1 Quantitative Data Analysis Procedure

Quantitative data collected for this study were analysed using descriptive statistical methods Using descriptive statistics helped to perform table and statistical representations, simple percentage, and frequency counts. Descriptive analysis also assisted to effectively describe independent variables and their nexus with some outcomes after gaining understanding about data, and discovery of their patterns (Pallant, 2010). The Statistical Package for Social Science (SPSS) software (version 23) was utilised, and the analysis was later used to explain the findings of the quantitative data. The researcher also performed an error check exercise to ensure that no distortion occurred to statistical analysis (Pallant, 2010).

4.8.2 Qualitative Data Analysis Procedure

Thematic analysis was carried out on qualitative data obtained from research participants who were interviewed. Thematic analysis method aids to locate, analyse, and describe themes or patterns culled out from participants' responses (Braun & Clarke, 2006). Thematic analysis is flexible and was adopted to examine relevant ideas and topics that emerged (Bryman, 2012) from the semi-structured interviews and lesson observations in this study. The semi-structured interviews were transcribed, and their verbatim transcripts aided inductive analyses which led to identify recurring themes and patterns. In this regards, recurrent themes were extracted from lessons observed and responses of educators, clinicians/ pediatricians and speech therapists rendering services to children with autism. This procedure is preferred as it helped to analyse qualitative data without reference to detailed theoretical framework such as grounded theory and other approach like discourse analysis (Braun & Clarke, 2006).

Furthermore, this study adopted Brune and Clarke's (2006) six steps to perform data analysis in order to arrive at correct analyses in relation to the research questions. The steps in order are: (i) familiarisation with available data, (ii) generating initial codes (iii) searching for themes (iv) reviewing the generated themes (v) defining and naming themes and (vi)

producing the report. In this study, the researcher made verbatim transcripts of the semi-structured interviews after the data collection stage. The researcher did the coding manually. This led to the generation of the themes based on study objectives and topics of discussion. Only the themes in line with the aim and objectives of the study were developed. Based on the findings, individual theme was used to arrive at certain conclusions (Maree & Pietersen, 2010). Meanwhile, one of the shortfalls of thematic analysis usually emerges by misapplying responses to research questions, or through poor usage of themes for the main analysis (Braun & Clarke, 2006), and these shortfalls were guided against in this study.

4.9 Limitations of the Study

This study focused primarily on the socio-communication aspect of Autism Spectrum Disorder (ASD) with reference to psycholinguistics, neurolinguistics and sociolinguistics characteristics of school aged children with ASD. The study excluded stereotypical, repetitive and non-verbal behaviours that are unrelated to expression and communication. The study also excluded adults with autism in the study areas. Furthermore, KwaZulu-Natal is a large province, only few places have formal schools or centres where children with autism were receiving education or academic training. Also, due to time constraint, and lack of funding, the study only covered 4 places (Durban, Pietermaritzburg, Richards Bay, and Empangeni) within the province, and 3 schools and 1 centre with children with ASD, though some schools have other children with other developmental disorders. Similarly, only few caregivers such as clinicians/pediatricians, and speech therapists were found across KwaZulu-Natal (KZN) just as the whole South Africa (and many African countries) at large have a small number of specialists and caregivers who focus on ASD.

In addition, children with autism have different phenotypes and disparities in accessing service providers due to the low socioeconomic status of their parents as well as living in remote areas rather than urban areas (Drahota et al., 2020). These factors shrunk the sample size and offered different perspectives to competence level each child with ASD may attain, therefore, the findings may not be generalised (Mack, 2010). Similarly, the COVID-19 pandemic (with long lockdown, loss of lives among others) had disproportionate effects such as enhanced stress level and economic burden on families of children with disabilities including those with autism from low and middle-income countries (Amaral & de Vries, 2020). This made some parents with such burdens respond with less enthusiasm, and that

might have reduced the quality of their responses. Another limitation of this study is the dearth of interdisciplinary studies on ASD, linguistics and communication. This affected cited sources and how participants responded during data collection as many of them were not familiar with interrogations on some aspects (like neurolinguistics) which formed part of this study. Nonetheless, this study has contributed to the body of knowledge, and gave relevant information that may aid discernment of autism and aspects of applied linguistics such as psycholinguistics, sociolinguistics and neurolinguistics. Essentially, this study explicated the nexus between linguistic and communicative competence and ASD in KZN, South Africa.

4.10. Summary

This chapter engaged in a comprehensive description of methodological approaches adopted in this study to investigate the linguistic and communicative competence of bi/multilingual children with autism in KwaZulu-Natal, South Africa. The discussion of the chapter was extended to the manner in which data were constructed within pragmatic research paradigm and in relation to answers to the research questions that offered direction to the study. The chapter further explained instruments of data collection and the processes it undertook. The procedure and rationale employed for sampling and sampling strategy were respectively discussed. The chapter discussed validity and reliability, as well as how pilot study was conducted, as well as the process for data analysis. Ethical issues and limitations of the study were also discussed. The next chapter presents data analysis and interpretation in connection with the research questions of the study.

CHAPTER FIVE

PRESENTATION OF QUANTITATIVE DATA

5.1 Introduction

This chapter focuses on the analysis of the quantitative data gathered for the study. As mentioned in chapter 4, a mixed method with combination of both quantitative and qualitative data collection techniques was adopted for this study, and a separate questionnaire was designed for parents and educators. This chapter therefore presents the quantitative data collected from the parents and from the educators through a structured questionnaire. The questionnaire designed for the parents is presented first followed by the one designed for educators.

5.2 Demographic Characteristics of the Study Respondents

The demographic features of the research respondents like age, gender, age group, employment status, number of languages with proficiency and their education level were considered while designing the instrument as well as during the data analyses. The respondents' demographic characteristics were analysed and presented in figures, tables and charts below.

5.2.1 Distribution of Respondents of Questionnaires

Four groups of research respondents were involved in this study. This section, however, presents data gathered through separate questionnaires: one designed for parents and the other for educators. These research respondents were recruited from four research sites. The research sites with their codes are Richards Bay (RS1), Empangeni (RS2), Durban (RS3), and Pietermaritzburg (RS4) as shown in Table 5.1 below.

Respondents	Richards Bay (RS1)	Empangeni (RS2)	Durban (RS3)	Pietermaritzburg (RS4)	Total
Parents	4	8	15	9	36
Educators	2	5	5	4	16
Total	6	13	20	14	52

Table 5.1: Frequency distribution of the respondents by research site

5.2.2 Gender of the Respondents (Parents)

Table 5.2 shows gender distribution of the parents of children with ASD who participated in the study. The majority of the respondents were female 27 (77.1%) and 8 (22.9%) respondents were male. This might signal that women tend to be primary caregivers of children with ASD.

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	8	22.9	22.9	22.9
	Female	27	77.1	77.1	100.0
	Total	35	100.0	100.0	

Table 5.2 Frequency distribution of respondents' (parents) gender

5.2.3 Age of the Respondents

Information in Table 5.3 illustrates the age of parents of children with ASD who participated in the study. The majority of the parents 24 (68.6%) from all research sites were between the ages of 31 and 40 years followed by those within the age bracket of 21 and 30 years (28.6 %) while 1 (2.9%) participant was between the ages of 41 and 50 years.

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21 -30 Years	10	28.6	28.6	28.6
	31-40 Years	24	68.6	68.6	97.1
	41-50 Years	1	2.9	2.9	100.0
	Total	35	100.0	100.0	

Table 5.3: Frequency distribution of respondents' (parents) age

5.2.4 Employment Status of the Respondents

In Table 5.2.4, the employment status of parents with ASD is presented. The table reveals that out of 35 parents sampled for the study, 20 (57.1%) were unemployed, while 15 (42.9%) were employed. This implies that the number of the unemployed parents is higher than the employed. The above result may be because most parents are primary caregivers, and such result may help to understand how they are able to provide the needed care for their children with ASD.

Employment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employed	15	42.9	42.9	42.9
	Unemployed	20	57.1	57.1	100.0
	Total	35	100.0	100.0	

Table 5.4: Frequency distribution employment status of parents

5.2.5 Education Level of the Respondents

Information in Table 5.5 establishes the academic level of parents with children with ASD using the standard applicable to South Africa where Matric is regarded as academic level obtained after writing the national examination at the end one's secondary school education (Grade 12). The table shows that parents have earned varied levels of education, and those with Matric were 5 (14.3%), those with Diploma were 12 (34.3%), those with First Degree were 14 (40.0%), and those who have earned either PGCE or Master's Degree were 4 (11.4%). This was significant to this study as it helped in determining whether education level had influence on people's knowledge and action concerning language and communication of people with ASD.

Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Matric	5	14.3	14.3	14.3
	Diploma	12	34.3	34.3	48.6
	First Degree	14	40.0	40.0	88.6
	PGCE/Master's Degree	4	11.4	11.4	100.0
	Total	35	100.0	100.0	

Table 5.5: Frequency distribution of level of education of the respondents

5.2.6 Respondents' Number of Languages with Proficiency

Information in Table 5.6 highlights the proficiency of sampled parents of children with ASD in their L1 and L2 or L3. The essence of this variable is significant to the understanding of parents' linguistic proficiency and/ or fluency as well as the possibility of exposing more than

one language to their children with ASD. The table indicates that none of the parents was monolingual while 25 (71.4%) and 10 (28.6%) of the sampled parents were bilingual and multilingual respectively. This implies that the majority of the parents are proficient in two or more languages and they can expose these languages to their children with ASD if they wish.

Number of languages with proficiency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2 Languages	25	71.4	71.4	71.4
	3 Language	10	28.6	28.6	100.0
	Total	35	100.0	100.0	

Table 5.6: Frequency distribution of parents' number of languages with proficiency

5.2.7 Age Distribution of Each Child with ASD

In Table 5.7, the information supplied by the parents concerning the age of their children with ASD is presented. This is significant for understanding the relationship between the main age and the age each of their children were diagnosed. The table reveals that two parents have 1 child each whose ages were between 0 and 5 years and 21-25 years, and then constituting 2.9% each. The majority of the parents 16 (45.7%) showed that their children's age ranged from 6-10 years, while 12 (34.2%) of the parents indicated that their children were between 11 and 15 years old. Similarly, few parents 5 (14.3%) revealed that their children with ASD were between 16-20 years of age.

Age distribution of each child with autism

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5	1	2.9	2.9	2.9
	6-10	16	45.7	45.7	48.6
	11-15	12	34.2	34.2	85.7
	16-20	5	14.3	14.3	100.0
	21-25	1	2.9	2.9	
	Total	35	100.0	100.0	

Table 5.7: Frequency distribution of age of each child with autism

5.2.8 Age of Diagnoses of Each Child with ASD

Table 5.8 indicates parents' information regarding the age in which their children were

diagnosed of ASD. This information is essential to verify how early or when did these children with ASD begin intervention pertaining to this disorder and the possible effect it has had on their language and communication. As indicated in Table 5.8, only 4 (11.4%) children were diagnosed between the ages of 1 and 3; 16 (45.7%) children were diagnosed between the ages of 4 and 6; 13 (37.1%) children were diagnosed between the ages of 7 and 9; while only 2 children were diagnosed between the ages of 10 and 12.

Age diagnosed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-3 Years	4	11.4	11.4	11.4
	4-6 Years	16	45.7	45.7	57.1
	7-9 Years	13	37.1	37.1	94.3
	10-12	2	5.7	5.7	100.0
	Total	35	100.0	100.0	

Table 5:8: Frequency distribution of age in which each child with ASD was diagnosed

5.2.9 Additional Needs of Children with ASD Due to Learning Disability, Physical Disability or Sensory Impairment, or Both

Table 5.9 reveals the information parents supplied concerning some additional needs that their children with autism require. This is essential for establishing varied and additional intervention each child with ASD may need at home, school, or at any other relevant place. In Table 5.9, learning disability was identified as the highest additional issue among children with ASD as indicated by 29 (82.9%) parents. While 1 parent mentioned physical disability and a sensory impairment as additional issues her child with ASD had, 5 (14.3%) of the sampled parents indicated that their children required more intervention that would care for both learning disability and physical disability or sensory impairment.

Additional needs of children with ASD due to due to learning disability, physical disability or sensory impairment, or both

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Learning disability	29	82.9	82.9	82.9
	Physical disability or sensory impairment	1	2.9	2.9	85.7
	Both	5	14.3	14.3	100.0

Table 5.9: Frequency distribution of other needs of children with ASD due to learning

disability, physical disability or sensory impairment, or both

5.3 Places of Diagnoses

According to information supplied by the parents of children with ASD, Table 5.10 reveals that most children (30 (85.7%)) with ASD were diagnosed General Health Centre while 5 (14.3%) parents indicated that their children were diagnosed at the Child Development Centre. The essence of this is partly to reveal the most accessible place where parents can obtain diagnoses for their children with ASD. This will possibly reduce stress that parents experienced due to distance in a bid to get help for their children with ASD.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	The Child Development Centre	5	14.3	14.3	14.3
	General Health Centre	30	85.7	85.7	100.0
	Total	35	100.0	100.0	

Table 5.10: Frequency distribution of places of diagnosis

5.3.1 School Being Attended

In Table 5.11, information supplied by parents concerning the school, autism centre, and other place(s) being attended by their children with ASD is presented. This is significant to see whether the parents have a good working relationship with (special) teachers, school administrators, as well as school-based therapists in comparison with non-special schools or centres. While the majority of the parents (24 (68.6%)) confirmed that their children attended a school for children with special needs; 10 (28.6%) revealed that their children with ASD attended autism centre privately owned and managed. Similarly, 1 (2.9%) participant indicated training /further education /adult education as a place attended by his/her child.

My child attends one of the following places.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	School for Children with Special Needs	24	68.6	68.6	68.6
	Training /further education /adult education	1	2.9	2.9	71.4
	Autism Centre (Private)	10	28.6	28.6	100.0
	Total	35	100.0	100.0	

Table 5.11: Frequency distribution of school being attended by children with ASD

5.3.2 Support Received from Different Services

Table 5.12 reveals that parents of children with ASD received support from different professionals caring for children with ASD in one way or the other. This may include support rendered to autistic children at home, school, and at clinical centres. Table 5.12 shows that 22 (62.9%) parents received support services mostly from the schools and from educators of their children with ASD, followed by 6 (17.1%) who received services from speech and language therapists; while 5 (14.3%) parents received combined support services from speech language therapists (SLT), occupational therapists (OC), school teachers, and Child and Adolescent Mental Health Services (CAMHS). This result is crucial for getting what works best for children with ASD including enhancement of their language and communication.

We receive support from the following services.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Services from Speech and Language Therapists	6	17.1	17.1	17.1
	Services from School Teachers/ Educators	22	62.9	62.9	80.0
	Child and Adolescent Mental Health Service/ Services from Physiotherapists	2	5.7	5.7	85.7
	Services from SLT, OC, School Teachers, and CAMHS	5	14.3	14.3	100.0
	Total	35	100.0	100.0	

Table 5.12: Frequency distribution of support received from different services

5. 3.3 Parents' Satisfactions from the Assessment

Parents were asked a question concerning the satisfaction they derived from services obtained in the last 2 years from different professionals they had engaged, and Table 5.13 indicates their responses. The table shows that the majority of the parents (23: 65.7%) were not satisfied with the process in which the assessment took and 2 (5.7%) of them were very unsatisfied. While 5 (14.3%) were very satisfied with the assessment process, 3 (8.6%) were just satisfied. This variable may help track the ease of assessing diagnoses and intervention, which in turn may affect how parents are able to care for their children with ASD including

the time for engaging in both verbal and non-verbal communications which can lead to linguistic and communicative competence.

If your child/young person has been offered an assessment for an autistic spectrum condition in the last 12 months, how satisfied were you with the process?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unsatisfied	2	5.7	5.7	5.7
	Unsatisfied	23	65.7	8.6	14.3
	Neutral	2	5.7	5.7	20.0
	Satisfied	3	8.6	65.7	85.7
	Very Satisfied	5	14.3	14.3	100.0
	Total	35	100.0	100.0	

Table 5.13: Frequency distribution of parents' satisfaction of assessment offered in the last 24 months

5.3.4 Parent's Reports on Language and Communication of Children with ASD

In this part, relevant information supplied by the parents concerning the language and communication of their children is presented, and the responses were pertained to research question 3, as shown in item i to iii below. The significance of this is to help in examining the process that might have aided or deterred language development that entails language acquisition, language production, and language comprehension and the use of one or multiple language(s) for various social interactions and communications at home and school especially.

i. **Number of languages the children with ASD are exposed to and used for communication at home**

Parents were asked to indicate the number of languages they expose to their children with ASD and the number of languages used to communicate with their children with ASD at home. Though the variables were separated in the main questionnaire, the answers were the same as presented in table 5.14 and figure 5.14. In Table 5.14, it is revealed that 30 (85.7%) of the parents exposed their children with ASD to one language as well as communicating with them using a language, while only 5 (14.3%) exposed their children with ASD to two languages and also communicating with them using the same number of languages.

How many languages do you expose him or her to and used for communication at home?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	30	85.7	85.7	85.7
	2	5	14.3	14.3	100.0
	Total	35	100.0	100.0	

Table 5.14: Frequency distribution of languages exposed to and used for communication at home

ii. **Reason for exposing him/her to a specific number of language(s)**

Table 5.15 indicates the reasons behind parents' choice of exposing one or two languages to their children with ASD. The table indicates that 77.1% (27) of the parents' choice was based on advice received from professionals, while 5 (14.3%) parents did so based on their personal belief and 3 (8.6%) parents were advised by some other people to choose a specific number of languages.

If you pick 1, 2, or 3 language(s) tick any of the options below to state why.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Based on Professional Advice	27	77.1	77.1	77.1
	Based on Personal Belief	5	14.3	14.3	91.4
	Based on what others advised	3	8.6	8.6	100.0
	Total	35	100.0	100.0	

Table 5.15: Frequency distribution of parents' reason of choosing a specific number of language(s)

iii. **The chosen languages**

Table 5.16 shows that out of 11 official languages in South Africa, 3 were widely used by the parents and the information in the table confirms them as bilingual or multilingual. The table indicates that the majority of the parents who participated in this study used isiZulu to communicate with their children with ASD as they constituted 22 (62.9%), while those who used to communicate with their children with ASD in English constituted 11 (31.4%); and others who used Afrikaans were 2 (5.7%).

Name of the language(s) widely used by the parents for communication.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	isiZulu	22	62.9	62.9	62.9
	English	11	31.4	31.4	94.3
	Afrikaans	2	5.7	5.7	100.0
	Total	35	100.0	100.0	

Table 5.16: Frequency distribution of name of language(s) used by parents for communication

5.3.5 Satisfaction Level of Parents of Children with ASD Concerning One or More Support Received

This section presents the level of satisfaction that parents derived from various centres they had visited for getting one support or the other such as diagnosis, intervention, and enhancement of language and communication of children with ASD. The essence of the variables under the above heading is the potential to reveal the extent of professionalism of caregivers that are in one way or the other rendering services to children with ASD. Importantly, the professionalism of these caregivers or otherwise has implication for linguistic and communicative competence of children with autism as shown in tandem below.

i. Level of satisfaction of support parents received from General Hospital

Table 5.17 indicates that 11 (31.4%) parents were satisfied and 6 (17.1%) were very satisfied about the support they received from General Hospital. While 5 (14.3%) and 1 (2.9 %) respectively revealed that General Hospital was not applicable to them and no opinion; 10 (28.6%) and 2 (5.7%) of the parents stated that they were not satisfied and very unsatisfied with the support they received from General Hospital respectively.

How satisfied you were with the support you received with regard to your child's autism/autistic traits from General Hospital?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unsatisfied	2	5.7	5.7	5.7
	Unsatisfied	10	28.6	28.6	34.3
	No opinion/ I don't know	1	2.9	2.9	37.1
	Satisfied	11	31.4	31.4	68.6
	Very Satisfied	6	17.1	17.1	85.7
	NA	5	14.3	14.3	100.0

Table 5.17: Frequency distribution of level of satisfaction of support parents received from General Hospital

ii. Level of satisfaction of support parents received from speech and language therapist

Table 5.18 reveals that the majority of the respondents 22 (62.9%) indicated they were not using the services of speech therapist and thereby not receiving support from them. While 5 (14.3%) were satisfied and 4 (11.4%) were very satisfied about the support they received from the speech and language therapist; 5 (8.6%) and 1 (2.9 %) revealed that they were not satisfied and very unsatisfied with the support they received from their speech and language therapist respectively.

How satisfied you were with the support you received with regard to your child's autism/autistic traits from Speech and Language Therapist?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unsatisfied	1	2.9	2.9	2.9
	Unsatisfied	3	8.6	8.6	11.4
	Satisfied	5	14.3	14.3	25.7
	Very Satisfied	4	11.4	11.4	37.1
	NA	22	62.9	62.9	100.0
	Total	35	100.0	100.0	

Table 5.18: Frequency distribution of support parents received from speech and language therapist

iii. Level of satisfaction of support parents received from occupational therapist

Table 5.19 shows the responses of the respondents indicating their level of satisfaction concerning the support they received from occupational therapist. The majority of the respondents (24 (68.6%)) were not receiving support from occupational therapists, but 4 (11.4%) and 2 (5.7%) were satisfied and very satisfied respectively. Additionally, 1 (2.9%) and another 1 (2.9%) participant were satisfied and very satisfied respectively with the support they received from occupational therapists.

How satisfied you were with the support you received with regard to your child's autism/autistic traits from Occupational Therapist?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unsatisfied	1	2.9	2.9	2.9
	Unsatisfied	1	2.9	2.9	5.7
	No opinion/ I don't know	3	8.6	8.6	14.3
	Satisfied	4	11.4	11.4	25.7
	Very Satisfied	2	5.7	5.7	31.4
	NA	24	68.6	68.6	100.0
	Total	35	100.0	100.0	

Table 5.19: Frequency distribution of support parents received from occupational therapist

iv. Level of satisfaction of support parents received from Child and Adolescent Mental Health Services

Information in Table 5.20 indicates that the majority of the respondents (27 (77.1%)) were not receiving support from Child and Adolescent Mental Health Services; however, 4 (11.4%) and 1 (2.9%) were satisfied and very satisfied respectively. In addition, 1 (2.9%) and another 1 (2.9%) participant were unsatisfied and very unsatisfied respectively with the support they received from Child and Adolescent Mental Health Services.

How satisfied you were with the support you received with regard to your child's autism/autistic traits from Child and Adolescent Mental Health Services?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unsatisfied	1	2.9	2.9	2.9
	Unsatisfied	1	2.9	2.9	5.7
	No opinion/ I don't know	1	2.9	2.9	8.6
	Satisfied	4	11.4	11.4	20.0
	Very Satisfied	1	2.9	2.9	22.9
	NA	27	77.1	77.1	100.0
	Total	35	100.0	100.0	

Table 5.20: Frequency distribution of support parents received from Child and Adolescent Mental Health Services

v. Level of satisfaction of support parents received from physiotherapist

Information in Table 5.21 establishes that the majority of the parents (23 (65.7%)) were not receiving support from physiotherapists; however, 4 (11.4%) were satisfied with the support they received and 3 (8.6%) preferred to keep their opinion. In addition, 1 (2.9%) and another 4 (11.4%) respondents were very unsatisfied and unsatisfied respectively with the support they received from physiotherapists.

How satisfied you were with the support you received with regard to your child's autism/autistic traits from Physiotherapist?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unsatisfied	1	2.9	2.9	2.9
	Unsatisfied	4	11.4	11.4	14.3
	No opinion/ I don't know	3	8.6	8.6	22.9
	Satisfied	4	11.4	11.4	34.3
	NA	23	65.7	65.7	100.0
	Total	35	100.0	100.0	

Table 5.21: Frequency distribution of support parents received from physiotherapist

vi. Level of satisfaction of support parents received from social worker

Information in Table 5.22 discloses that the majority of the parents (25 (71.4%)) did not have basic opinion about any support received from social worker. Also, the table reveals that 3 (8.6%) were satisfied while 2 (5.7%) were very satisfied with the support they received.

How satisfied you were with the support you received with regard to your child's autism/autistic traits from social worker?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unsatisfied	2	5.7	5.7	5.7
	Unsatisfied	2	5.7	5.7	11.4
	No opinion/ I don't know	25	71.4	71.4	82.9
	Satisfied	3	8.6	8.6	91.4
	Very Satisfied	2	5.7	5.7	97.1
	NA	1	2.9	2.9	100.0
	Total	35	100.0	100.0	

Table 5.22: Frequency distribution of support parents received from social worker

vii. Level of satisfaction of support parents received from school

Table 5.23 presents information supplied by parents of children with ASD regarding support they received from school. While the majority of the respondents (21 (60.0%)) were satisfied, 3 (8.6%) were very satisfied; those who were unsatisfied and very unsatisfied were 4 (11.4%) each.

How satisfied you were with the support you received with regard to your child's autism/autistic traits from school?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unsatisfied	4	11.4	11.4	11.4
	Unsatisfied	4	11.4	11.4	22.9
	No opinion/ I don't know	3	8.6	8.6	31.4
	Satisfied	21	60.0	60.0	91.4
	Very Satisfied	3	8.6	8.6	100.0
	Total	35	100.0	100.0	

Table 5.23: Frequency distribution of support parents received from school

5.3.6 Professionals' or Caregivers' Understanding of Impact of ASD on Family Life of Parents of Children with ASD

In this section of the analysis, the perceived understanding that professionals or caregivers attending to children with ASD have regarding the impact of ASD on family life of the parents. The significance of this section is its potential to elicit information about impact of ASD on family life; that is, what professionals or other caregivers understand about the stress or comfort parents might be experiencing in a bid to care for their children with ASD. Some relevant responses, tables, and figures are presented below.

i. **General Hospital Professionals' Understanding of the Impact of ASD on Family Life**

Table 5.24 shows the responses of the parents on whether General Hospital professionals understand the impact of ASD on family life of the parents, and 4 (11.4 %) respondents strongly disagreed while 8 (31.4%) disagreed. In addition, 16 (45.7%) agreed and 6 (17.1%) strongly agreed.

General Hospital professionals understand the impact of autism spectrum disorder upon my family life.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	11.4	11.4	11.4
	Disagree	8	22.9	22.9	34.3
	No opinion/ I don't know	1	2.9	2.9	37.1
	Agree	16	45.7	45.7	82.9
	Strongly Agree	6	17.1	17.1	100.0
	Total	35	100.0	100.0	

Table 5.24: Frequency distribution of General Hospital professionals' understanding of the impact of ASD on family life

ii. **Speech and Language Therapy Professionals' Understanding of the Impact of ASD on Family Life**

Table 5.25 indicates the responses of the parents on whether speech and language therapy professionals understand the impact of ASD on family life of the parents. While the majority (21 (60.0%)) of the respondents indicated that they had no idea, 1 (2.9%) and 4 (11.4 %) respondents strongly disagreed and disagreed respectively. Also, 7 (20.0%) of the respondents agreed and 2 (5.7%) strongly agreed.

Speech and Language Therapy professionals understand the impact of autism spectrum disorder upon my family life.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	2.9	2.9	2.9
	Disagree	4	11.4	11.4	14.3
	No opinion/ I don't know	21	60.0	60.0	74.3
	Agree	7	20.0	20.0	94.3
	Strongly Agree	2	5.7	5.7	100.0
	Total	35	100.0	100.0	

Table 5.25: Frequency distribution of speech and language professionals' understanding of the impact of ASD on family life

iii. Occupational Therapy Professionals' Understanding of the Impact of ASD on Family Life

Table 5.26 reveals the responses of the parents whether occupational therapy professionals understand the impact of ASD on family life of the parents. While the majority (25 (71.4%)) of the respondents indicated that they had no idea; 2 (5.7 %) respondents disagreed. In addition, 5 (14.3%) of the respondents agreed and 1 (2.9%) strongly agreed.

Occupational Therapy professionals understand the impact of autism spectrum disorder upon my family life.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	5.7	5.7	5.7
	No opinion/ I don't know	25	71.4	71.4	77.1
	Agree	5	14.3	14.3	91.4
	Strongly Agree	1	2.9	2.9	94.3
	N/A	2	5.7	5.7	100.0
	Total	35	100.0	100.0	

Table 5.26: Frequency distribution of occupational therapy professionals' understanding of the impact of ASD on family life

iv. Child and Adolescent Mental Health Services Professionals' Understanding of the Impact of ASD on Family Life

Table 5.27 reveals the responses of the parents whether Child and Adolescent Mental Health Services professionals understand the impact of ASD on family life of the parents. While 8 (22.9%) Agreed; 12 (34.3%) of the respondents Strongly Agreed. Additionally, 4 (11.4 %) respondents Disagreed and 11 (31.4%) of the respondents expressed no opinion.

Child and Adolescent Mental Health Service professionals understand the impact of autism spectrum disorder upon my family life.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	4	11.4	11.4	11.4
	No opinion/ I don't know	11	31.4	31.4	42.9
	Agree	8	22.9	22.9	65.7
	Strongly Agree	12	34.3	34.3	100.0
	Total	35	100.0	100.0	

Table 5.27: Frequency distribution of Child and Adolescent Mental Health Services professionals' understanding of the impact of ASD on family life

v. Physiotherapy Professionals' Understanding of the Impact of ASD on Family Life

Table 5.28 reveals the responses of the parents on whether physiotherapy professionals understand the impact of ASD on family life of the parents. While the majority, that is 26 (74.3%) of the respondents indicated that it was Not Applicable; 3 (8.6%) respondents Disagreed. In addition, 4 (11.4%) of the respondents Agreed and 2 (5.7%) Strongly Agreed.

Physiotherapy professionals understand the impact of autism spectrum disorder upon my family life.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	3	8.6	8.6	8.6
	Agree	4	11.4	11.4	20.0
	Strongly Agree	2	5.7	5.7	25.7
	N/A	26	74.3	74.3	100.0
	Total	35	100.0	100.0	

Table 5.28: Frequency distribution of physiotherapy professionals' understanding of the impact of ASD on family life

vi. Social Work Professionals' Understanding of the Impact of ASD on Family Life

Table 5.29 reveals the responses of the parents whether social work professionals understand the impact of ASD on family life of the parents. While the majority, that is 22 (62.9%) of the respondents indicated that did not know; 5 (14.3%) respondents disagreed and 2 (5.7%) strongly disagreed. Also, 3 (8.6%) of the respondents agreed and 2 (5.7%) strongly agreed.

Social work professionals understand the impact of autism spectrum disorder upon my family life.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	5.7	5.7	5.7
	Disagree	5	14.3	14.3	20.0
	No opinion/ I don't know	22	62.9	62.9	82.9
	Agree	3	8.6	8.6	91.4
	Strongly Agree	2	5.7	5.7	97.1
	N/A	1	2.9	2.9	100.0
	Total	35	100.0	100.0	

Table 5.29: Frequency distribution of social work professionals' understanding of the impact of ASD on family life

vii. School Professionals' Understanding of the Impact of ASD on Family Life

Table 5.30 displays the distribution of the parents concerning how school professionals (such as educators, school administrators and others) give care to children with ASD. The analysis of the data indicates that some 9 (25.7%) respondents and 12 (34.3%) others agreed and strongly agreed respectively. While some respondents 8 (22.9%) revealed no opinion, 6 (17.1%) disagreed.

Professionals at schools understand the impact of autism spectrum disorder upon my family life.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	6	17.1	17.1	17.1
	No opinion/ I don't know	8	22.9	22.9	40.0
	Agree	9	25.7	25.7	65.7
	Strongly Agree	12	34.3	34.3	100.0
	Total	35	100.0	100.0	

Table 5.30: Frequency distribution of school professionals' understanding of the impact of ASD on family life

5.3.7 Schools and Related Services Available for Children with ASD

In this part of the analysis, the parents indicated the one or more services received from special school or autism centre that their children with ASD attend. This is essential to the overall results of this study as school or autism centre may serve different purposes to children with ASD. The tables, and figures presented below show the most relevant responses.

i. Accessing services at local school and the type of services

Table 5.31 shows different types of services these parents have accessed at school that their children with ASD attend. The majority of the parents (23 (65.7%)) identified that they had accessed services from educators, while 5 (14.3%) mentioned they had accessed services from occupational therapists. Only 2 (5.7%) accessed services from speech and language therapists. These results are based on confirmation made by all the respondents that they accessed service(s) at school.

Please state the name of the service(s).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Service from Occupational Therapists	5	14.3	14.3	14.3
	Service from Speech and Language Therapists	2	5.7	5.7	20.0
	Service from Educators	23	65.7	65.7	85.7
	Service from all of the above	5	14.3	14.3	100.0
	Total	35	100.0	100.0	

Table 5.31: Frequency distribution of services accessed at local school and the type of services

ii. Rating the services obtained at school

The majority of the parents in Table 5. 32 rated the services obtained at school high as 17 (48.6%) were satisfied and 10 (28.6%) were very satisfied. Those who were dissatisfied and very dissatisfied respectively were 6 (17.1%) and 2 (5.7%).

Please rate the school service(s).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Disatisfied	2	5.7	5.7	5.7
	Disatisified	6	17.1	17.1	22.9
	Satisfied	17	48.6	48.6	71.4
	Very Satisfied	10	28.6	28.6	100.0
	Total	35	100.0	100.0	

Table 5.32: Frequency distribution of rating services accessed at local school

iii. Information sharing about children with ASD

Parents were asked whether they would like service providers including the school to share information with other people about their children with ASD. Table 5.33 shows that the majority of the parents (28 (80.0%)) said no, while only 7 (20.0%) said yes. This result is essential to understand the extent of fear of stigmatisation, the reason for lack of adequate knowledge about ASD in some society, and the reason for inadequate support from non-relatives or siblings of people with ASD.

Would you like service providers including the school to share information about your child?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	7	20.0	20.0	20.0
	No	28	80.0	80.0	100.0
	Total	35	100.0	100.0	

Table 5.33: Frequency distribution of information sharing about children with ASD

5.3.8 Parents' Specific Perspectives to ASD

This section of the analysis presents how parents of children with ASD perceived autism. This ranges from their personal to cultural perspectives as well as how they felt the professionals should help their children overcome the disorder. The significance of this part of the findings is the ability to elicit information about some parents' positive or negative thoughts, and expectations as regards their children with ASD. The relevant responses were in line with research question 1 as presented below.

i. Perspectives about the prevalence of ASD in some culture

In Table 5.34, the majority of the respondents 21 (60.0 %) disagreed while 5 (14.3%) strongly disagreed that ASD is common in one or some culture than the others. While 5 (14.3%) were neutral, 3 (8.6%), and 1 (2.9%) among the respondents respectively agreed and strongly agreed.

I have thought that autism is common to some culture.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	14.3	14.3	14.3
	Disagree	21	60.0	60.0	74.3
	Neutral	5	14.3	14.3	88.6
	Agree	3	8.6	8.6	97.1
	Strongly Agree	1	2.9	2.9	100.0
	Total	35	100.0	100.0	

Table 5.34: Frequency distribution of perspectives about the prevalence of ASD in some culture

ii. Perspectives about whether autism is caused by witchcraft or other spiritual problems

In Table 5.35, the majority of the respondents 20 (57.7 %) disagreed while 5 (14.3%) strongly disagreed that ASD is caused by witchcraft or other spiritual problems. While 4 (11.4%) were neutral, another 4 (11.4%) and 2 (5.7%) among the respondents respectively agreed and strongly agreed.

I have thought that autism is caused by witchcraft or other spiritual problems.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	5	14.3	14.3	14.3
Disagree	20	57.1	57.1	71.4
Neutral	4	11.4	11.4	82.9
Agree	4	11.4	11.4	94.3
Strongly Disagree	2	5.7	5.7	100.0
Total	35	100	100	

Table 5.35 Frequency distribution of perspectives about whether ASD is caused by witchcraft or other spiritual problems

iii. ASD conditions will improve with time

In Table 5.36, the majority of the respondents (13 (37.1 %)) strongly agreed and another 13 (37.1%) agreed that ASD conditions of their children will improve over time. While 3 (8.6%) were neutral, another 4 (11.4%) and 2(5.7%) among the respondents respectively disagreed and strongly disagreed.

My child's ASD conditions will improve with time.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	5.7	5.7	5.7
	Disagree	4	11.4	11.4	17.1
	Neutral	3	8.6	8.6	25.7
	Agree	13	37.1	37.1	62.9
	Strongly Agree	13	37.1	37.1	100.0
	Total	35	100.0	100.0	

Table 5.36: Frequency distribution of perspectives about improvement of ASD condition over time

iv. Perspectives about professionals' understanding of how services work together and offering of guidance to parents

In Table 5.37, the majority of the respondents 13 (37.1 %) strongly disagreed and another 11 (34.1%) disagreed about the view that professionals understand how services work together and whether they offer guidance to parents. While 5 (14.3%) were neutral, 4 (11.4%) and 2 (5.7%) among the respondents respectively agreed and strongly agreed.

Professionals understand how services work together and are able to guide me/us.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	13	37.1	37.1	37.1
	Disagree	11	31.4	31.4	68.6
	Neutral	5	14.3	14.3	82.9
	Agree	4	11.4	11.4	94.3
	Strongly Agree	2	5.7	5.7	100.0
	Total	35	100.0	100.0	

Table 5.37: Frequency distribution of perspectives about professionals' understanding of how services work together and offering guidance to parents

v. Perspectives about the possibility of improved language and communication provided service providers work well on the children with ASD

In Table 5.38, the majority of the respondents 11 (31.4 %) agreed and 9 (25.7%) strongly agreed that there would be an improvement in language and communication of children with ASD if all service providers work well on the children. Conversely, 4 (11.4%) and 6 (17.1%) of the respondents respectively disagreed and strongly disagreed.

My child's language and communication will improve with time if all service providers or caregivers work well on him/her.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	17.1	17.1	17.1
	Disagree	4	11.4	11.4	28.6
	Neutral	5	14.3	14.3	42.9
	Agree	11	31.4	31.4	74.3
	Strongly Agree	9	25.7	25.7	100.0

Table 5.38: Frequency distribution of perspectives about the possibility of improved language and communication provided service providers work well on the children with ASD

vi. Perspectives about what has worked well as a support for children with autistic traits

Table 5.39 indicates that the majority of the respondents (20 (57.1)) showed that learning at school only has worked well for them, while healthcare was rated second as 8 (22.9%) of the respondents indicated it has worked well for them. Also, 2 (5.7 %) and 5 (14.3%) respectively indicated that attention from a professional and attention from various and relevant professionals has worked for them.

An example of what has worked well to support your child with autism/autistic traits.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Learning at school only	20	57.1	57.1	57.1
	Healthcare services only	8	22.9	22.9	80.0
	Attention from a professional	2	5.7	5.7	85.7
	Attention from various and relevant professionals	5	14.3	14.3	100.0

Table 5.39: Frequency distribution of perspectives about what has worked well for children with autism/ autistic traits

5.4 Analyses of Educators' Questionnaire

This section focuses on the analysis of educators' questionnaire, while the next section analyses the last part of the questionnaire of both the parents and the educators which was derived from Communication Matrix.

5.4.1 Gender of the Respondents (Educators)

Table 5.40 shows the gender of the educators of children with ASD who participated in the study. There were 4 (25.0%) males and 12 (75.0%) females. The result suggests that women are the primary caregivers of children with autism.

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	4	25.0	25.0	25.0
	Female	12	75.0	75.0	100.0

Table 5.40: Frequency distribution of educators' gender.

5.4.2 Age of the Respondents (Educators)

Information in Table 5.41 displays the age of educators of children with ASD who participated in the study. Those who were between the age of 26 and 30, and between 36 and 40 were 6 (37.5%) each, while those who were between the age of 21 and 25, and 31 and 35 were 2 (12.5) each. It is deducible that most educators are young.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-25	2	12.5	12.5	12.5
	26-30	6	37.5	37.5	50.0
	31-35	2	12.5	12.5	62.5
	36-40	6	37.5	37.5	100.0
	Total	16	100.0	100.0	

Table 5.41: Frequency distribution of educators' age

5.4.3 Level of Education

Information in Table 5.42 indicates the education level of the educators of children with ASD who participated in the study. The majority of the educators (9 (56.2%)) had earned first degree while 3 (18.8%) and 4 (25.0%) had obtained PGCE/ Master's and diploma respectively. The result is significant to ascertain the level of knowledge, exposure and training these educators have acquired and which can in turn influence teaching career.

Level of Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma	4	25.0	25.0	25.0
	First Degree	9	56.2	56.2	81.2
	PGCE/Masters	3	18.8	18.8	100.0
	Total	16	100.0	100.0	

Table 5.42: Frequency distribution of respondents' level of education

5.4.4 Years of Teaching Experience with Children with ASD

Table 5.43 shows the years in which each educator has been teaching children with ASD. While 8 (50.0%) had 2-4 years teaching experience, 5 (31.2%) of the educators had 5-7 years of teaching experience. Those with 8-10 years teaching experience were 3 (18.8%). The

importance of this result include possibility of examining and accessing the teaching strategies employed by educators of children with autism.

Years of teaching experience with children with ASD

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2-4	8	50.0	50.0	50.0
	5-7	5	31.2	31.2	81.2
	8-10	3	18.8	18.8	100.0
	Total	16	100.0	100.0	

Table 5.43: Frequency distribution of educators' years of teaching experience with children with ASD

5.4.5 Educators' Number of Languages with Proficiency

Information in Table 5.44 highlights the proficiency of sampled educators of children with ASD in their L1 and L2 or L3. The essence of this variable is significant to the understanding of educators' linguistic proficiency and/ or fluency as well as the possibility of exposing more than one language to children with ASD. The table indicates that none of the educators was monolingual while 13 (81.2%) and 3 (18.8%) of the sampled educators were bilingual and multilingual respectively.

Number of languages with proficiency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Two	13	81.2	81.2	81.2
	Three	3	18.8	18.8	100.0
	Total	16	100.0	100.0	

Table 5.44: Frequency distribution of educators 'number of languages with proficiency

5.4.6 Number of Languages Used for Teaching

Table 5.45 displays the number of language(s) being used to teach children with ASD. The majority of the educators (11 (68.6%)) used one language. Conversely, 4 (25.0%) and 1 (6.2%) of the educators were using two and three languages respectively. The above responses partly answer research question 3.

Number of languages used for teaching

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	One	11	68.8	68.8	68.8
	Two	4	25.0	25.0	93.8
	Three	1	6.2	6.2	100.0
	Total	16	100.0	100.0	

Table 5.45: Frequency distribution of educators based on their views on number of languages used for teaching

5.4.7 Low Intelligent Quotient (IQ) of Most Children with ASD

Table 5.46 shows the respondents' responses to low IQ of most children with ASD, and these views partly answered research question 4 and 5 from this section to section 5.59. In Table 5.46, 4 (25.0%) and 5 (31.2%) respectively strongly agreed and agreed to low IQ of most ASD children. On the other hand, 5 (31.2%) and 2 (12.5%) respondents respectively disagreed and strongly disagreed.

Most children with ASD are with low intelligent quotient

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	4	25.0	25.0	25.0
	Agree	5	31.2	31.2	56.2
	Disagree	5	31.2	31.2	87.5
	Strongly Disagree	2	12.5	12.5	100.0
	Total	16	100.0	100.0	

Table 5.46: Frequency distribution of educators based on their opinions that low intelligent quotient (IQ) of most children with ASD

5.4.8 Most Children with ASD Cannot Express Mental State

Table 5.47 below illustrates educators' views about what they felt about the inability of most children with ASD to express their mental state. Out of the total number of respondents selected for the study across the research sites, 3 respondents, representing 18.8% strongly agreed to the statement, while 4 respondents, representing 25.0% agreed to the statement. Conversely, 2 respondents representing 12.5 % were neutral; 4 respondents, representing 25.0% disagreed, and 3 respondents, representing 18.8%, strongly disagreed to the statement.

Most children with ASD cannot express mental state

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	3	18.8	18.8	18.8
	Agree	4	25.0	25.0	43.8
	Neutral	2	12.5	12.5	56.2
	Disagree	4	25.0	25.0	81.2
	Strongly Disagree	3	18.8	18.8	100.0
	Total	16	100.0	100.0	

Table 5.47: Frequency distribution of educators based on their perceptions on inability of most children with ASD to express mental state

5.4.9 Lack Theory of Mind (ToM) by Most Children with ASD

Table 5.48 below illustrates educators' views about what they felt about the lack of Theory of Mind (ToM) by most children with ASD. Out of the total number of respondents selected for the study across the research sites, 5 respondents, representing 31.2% strongly agreed to the statement, while 1 respondent, representing 6.2% agreed to the statement. Conversely, 7 respondents, representing 43.8% disagreed, while 2 respondents, representing 12.5%, strongly disagreed to the statement.

Most children with ASD lack Theory of Mind

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	5	31.2	31.2	31.2
	Agree	1	6.2	6.2	37.5
	Neutral	1	6.2	6.2	43.8
	Disagree	7	43.8	43.8	87.5
	Strongly Disagree	2	12.5	12.5	100.0
	Total	16	100.0	100.0	

Table 5.48: Frequency distribution of educators based on their views on lack of Theory of Mind (ToM) by most children with ASD

5.5.0 Lack of Theory of Mind Adds to Linguistic and Communication Competence Issues

Table 5.49 below shows educators' views concerning the notion that lack of Theory of Mind (ToM) by most children with ASD adds to their linguistic and communicative competence

issues. Out of the total number of educators selected for the study across the research sites, 1 educator, representing 6.2% strongly agreed to the statement, while 2 educators, representing 12.5% agreed to the statement. Alternately, 7 educators, representing 43.8% disagreed, while 5 educators, representing 12.5%, strongly disagreed to the statement.

Lack of Theory of Mind adds to linguistic and communicative competence issues.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	1	6.2	6.2	6.2
	Agree	2	12.5	12.5	18.8
	Neutral	1	6.2	6.2	25.0
	Disagree	7	43.8	43.8	68.8
	Strongly Disagree	5	31.2	31.2	100.0
	Total	16	100.0	100.0	

Table 5.49: Frequency distribution of educators based on their views that lack Theory of Mind (ToM) adds to linguistic and communicative competence issues

5.5.1 Language and Communication Impairments are Related to Brain Functionality

Table 5.50 illustrates the educators' views concerning the relatedness of brain functionality and language and communication impairments. While 4 (25.0%) and 3 (18.8%) educators respectively strongly agreed and agreed to this view; 5 (31.2%) and 2 (12.5%) educators disagreed and strongly disagreed respectively. Other 2 (12.5%) educators were neutral.

Language and communication impairments are related to brain functionality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	4	25.0	25.0	25.0
	Agree	3	18.8	18.8	43.8
	Neutral	2	12.5	12.5	56.2
	Disagree	5	31.2	31.2	87.5
	Strongly Disagree	2	12.5	12.5	100.0
	Total	16	100.0	100.0	

Table 5.50: Frequency distribution of educators based on their perceptions about relatedness of brain functionality and language and communication impairments

5.5.2 Disruption of Brain Parts Adds to Linguistic and Communicative Competence Issues

Table 5.51 illustrates the educators' responses to the view that disruption of brain parts adds to linguistic and communicative competence issues. While 2 (12.5%) and 3 (18.8%) educators strongly agreed and agreed to this view; 8 (50.0%) and 3 (18.8%) educators disagreed and strongly disagreed respectively.

Disruption of brain parts adds to linguistic and communicative competence issues.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	2	12.5	12.5	12.5
	Agree	3	18.8	18.8	31.2
	Disagree	8	50.0	50.0	81.2
	Strongly Disagree	3	18.8	18.8	100.0
	Total	16	100.0	100.0	

Table 5.51: Frequency distribution of educators based on their perceptions that disruption of brain parts adds to linguistic and communicative competence issues

5.5.3 Neurolinguistic Study/ Assessment can Reveal Abnormal, Delayed, or Absence of both Receptive and Expressive Language Impairment in Autistic Children

Table 5.52 presents perceptions of the respondents concerning the ability of neurolinguistics study or assessment to reveal the nature of both receptive and expressive language of children with ASD. The majority of the respondents 6 (37.5%) and 5 (31.2%) disagreed and strongly disagreed respectively. Conversely, 2 (12.5%) and 3 (18.8%) among the respondents strongly agreed and agreed to this view.

Neurolinguistic study/ assessment can reveal abnormal, delayed, or absence of both receptive and expressive language impairment in autistic children.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	2	12.5	12.5	12.5
	Agree	3	18.8	18.8	31.2
	Disagree	6	37.5	37.5	68.8
	Strongly Disagree	5	31.2	31.2	100.0
	Total	16	100.0	100.0	

Table 5.52: Frequency distribution of educators based on their perceptions concerning the ability of neurolinguistic study/ assessment to reveal abnormal, delayed, or absence of both receptive and expressive language impairment in autistic children

5.5.4 Verbal Intelligence (VIQ) of Children with Autism and Assessment

Table 5.53 illustrates the educators' views concerning verbal intelligence of children with ASD and their assessment through receptive and expressive spoken language tests. While 4 (25.0%) and 5 (31.3%) educators respectively strongly agreed and agreed to this view; 4 (25.0%) and 1 (6.3%) disagreed and strongly disagreed respectively. Other 2 (12.5%) educators were neutral.

Verbal intelligence (VIQ) of children with autism can be assessed through performance on one or more tests involving receptive and/or expressive spoken language.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	4	25.0	25.0	25.0
	Agree	5	31.3	31.3	56.3
	Neutral	2	12.5	12.5	68.8
	Disagree	4	25.0	25.0	93.8
	Strongly Disagree	1	6.3	6.3	100.0
	Total	16	100.0	100.0	

Table 5.53: Frequency distribution of educators based on their perceptions concerning verbal intelligence (VIQ) of Children with autism and assessment

5.5.5 Language Production, Acquisition, and Development can be Delayed, be in Deficit, or be Absent in Autistic Children

Table 5.54 shows the educators' opinions on delay, deficit, and absence of language production, acquisition, and development among children with ASD. The majority of educators, i.e., 3 (18.8%) and 8 (50.0%) respectively strongly agreed and agreed to this view. On the other hand, 2 (12.5%) and 1 (6.3%) educator disagreed and strongly disagreed respectively. Other 2 (12.5%) educators also indicated neutrality on the view.

Language production, acquisition, and development can be delayed, be in deficit, or be absent in autistic children.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	3	18.8	18.8	18.8
	Agree	8	50.0	50.0	68.8
	Neutral	2	12.5	12.5	81.3
	Disagree	2	12.5	12.5	93.8
	Strongly Disagree	1	6.3	6.3	100.0
	Total	16	100.0	100.0	

Table 5.54: Frequency distribution of educators based on their opinions delay, deficit, and absence of language production, acquisition, and development among children with ASD

5.5.6 Echolalia and Language Regression among Children with Autism

Table 5.55 illustrates the educators' views on echolalia and language regression among children with ASD. According to their responses, 2 (12.5%) and 6 (37.5%) respectively strongly agreed and agreed to this view. On the contrary, 6 (37.5%) and 2 (12.5%) educators disagreed and strongly disagreed respectively.

Among children with autism, echolalia, and 'language regression' which means difficulties of skill acquisition and frequent loss of or failure to use existing language and social skills after normal development are common among children with autism.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	2	12.5	12.5	12.5
	Agree	6	37.5	37.5	50.0
	Disagree	6	37.5	37.5	87.5
	Strongly Disagree	2	12.5	12.5	100.0
	Total	16	100.0	100.0	

Table 5.55: Frequency distribution of educators based on their views on echolalia, and language regression among children with autism

5.5.7 Deficiency in Mental Processes Involved in the Comprehension, Production, and Acquisition of Language(s) and Its influence on the Overall Linguistic and Communicative Competence of Autistic Children

Table 5.56 presents the educators' perceptions on the deficiency in mental processes involved to comprehend, produce and acquire language(s) as well as its influence on linguistic and communicative competence of children with ASD. According to their responses, 3 (18.8%) and 2 (12.5%) respectively strongly agreed and agreed to this view. Conversely, 6 (37.5%)

and 3 (18.8%) educators disagreed and strongly disagreed respectively; while 2 (12.5%) educators were neutral.

Deficiency in mental processes involved in the comprehension, production, and acquisition of language(s) influence the overall linguistic and communicative competence of autistic children.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	3	18.8	18.8	18.8
	Agree	2	12.5	12.5	31.3
	Neutral	2	12.5	12.5	43.8
	Disagree	6	37.5	37.5	81.3
	Strongly Disagree	3	18.8	18.8	100.0
	Total	16	100.0	100.0	

Table 5.56: Frequency distribution of educators based on their perceptions on deficiency in mental processes involved to comprehend, produce and acquire language(s) as well as its influence on linguistic and communicative competence of children with ASD

5.5.8 Semantics, grammar, and pragmatics aspects of language may develop lately or deficiently among children with autism unlike children without autism

Table 5.57 illustrates the educators' opinions concerning the nature of development of semantics, grammar, and pragmatics among children with ASD. Based on their responses, 3 (18.8%) and 7 (43.8%) respectively strongly agreed and agreed that semantics, grammar, and pragmatics aspects of language may develop later or deficiently among children with autism. Conversely, 4 (25.0%) educators disagreed, while 2 (12.5%) educators were neutral.

Semantics, grammar, and pragmatics aspects of language may develop lately or deficiently among children with autism unlike children without autism.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	3	18.8	18.8	18.8
	Agree	7	43.8	43.8	62.5
	Neutral	2	12.5	12.5	75.0
	Disagree	4	25.0	25.0	100.0
	Total	16	100.0	100.0	

Table 5.57: Frequency distribution of educators based on their perceptions on the nature of development of semantics, grammar, and pragmatics among children with ASD

5.5.9 Absence or Deficiency of Discourse or Conversational Principles

Table 5.58 illustrates the responses of sampled educators concerning the absence or deficiency of discourse or conversational principles observed among children with ASD.

Based on these responses, the majority of 8 (50.0%) educators and another 6 (37.5%) respectively strongly agreed and agreed. Conversely, 1 (6.3%) educator disagreed and another 1 (6.3%) was neutral.

There is absence or deficiency of discourse or conversational principles (e.g., politeness, turn taking, making formal conversations).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	8	50.0	50.0	50.0
	Agree	6	37.5	37.5	87.5
	Neutral	1	6.3	6.3	93.8
	Disagree	1	6.3	6.3	100.0
	Total	16	100.0	100.0	

Table 5.58: Frequency distribution of educators' perceptions on absence or deficiency of discourse or conversational principles observed among children with ASD

5.6.0 Respondents' Views Concerning Exposing Children with Autism to Two or Three Languages

Table 5.59 illustrates the responses of the sampled educators' about exposing children with ASD to two or three languages. According to their responses, the majority of 9 (56.3%) educators strongly agreed and 4 (25.0%) agreed. Conversely, 2 (12.5%) educators and 1 (6.3%) educator disagreed and strongly disagreed respectively. These views from this section to section 5.61 answered research question 3.

Exposing children with autism to two or three languages will complicate burdens associated with ASD.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	9	56.3	56.3	56.3
	Agree	4	25.0	25.0	81.3
	Disagree	2	12.5	12.5	93.8
	Strongly Disagree	1	6.3	6.3	100.0
	Total	16	100.0	100.0	

Table 5.59: Frequency distribution of educators' perceptions on exposing children with autism to two or three languages

5.6.1 Respondents' Views Concerning the Possibility of Children with ASD who are Verbal to Learn English, IsiZulu (or other languages)

Table 5.60 illustrates the perceptions of sampled educators on the possibility of children with ASD who are verbal to learn and use English, isiZulu, and other language in various contexts

of communication. While 3 (18.8%) and another 3 (18.8%) among the respondents strongly agreed and agreed respectively; the majority of 8 (50.0%) respondents disagreed and 2 (12.5%) strongly disagreed.

For the children with ASD who are verbal, English, IsiZulu (or other languages) can be learned, developed, and used in various contexts of communication.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	3	18.8	18.8	18.8
	Agree	3	18.8	18.8	37.5
	Disagree	8	50.0	50.0	87.5
	Strongly Disagree	2	12.5	12.5	100.0
	Total	16	100.0	100.0	

Table 5.60: Frequency distribution of educators' perceptions on the Possibility of Children with ASD who are Verbal to Learn English, IsiZulu (or other languages)

5.6.2 Respondents' Views on Earlier Interventions and Adequate Support from Qualified Educators, Clinicians, Family Members, and Speech Therapists for Enhancement of Linguistic and Communicative Competence

Table 5.61 illustrates educators' views on earlier interventions and adequate support from qualified educators, clinicians, family members, and speech therapists for enhancement of linguistic and communicative competence of children with ASD. These views from this section to section 5.80 partly answered research question 4 and 5. In Table 5.62, the majority of 8 (50.0%) educators strongly agreed and 5 (31.3%) agreed to the view. Conversely, 1 (6.3%) educator strongly disagreed, and another 1 (6.3%) disagreed while another 1 (6.3%) was neutral.

With earlier interventions and adequate support from qualified educators, clinicians, family members, and speech therapists; the linguistic and communicative competence of children with ASD can be enhanced.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	8	50.0	50.0	50.0
	Agree	5	31.3	31.3	81.3
	Neutral	1	6.3	6.3	87.5
	Disagree	1	6.3	6.3	93.8
	Strongly Disagree	1	6.3	6.3	100.0
	Total	16	100.0	100.0	

Table 5.61: Frequency distribution of educators' perceptions on earlier interventions and adequate support from qualified educators, clinicians, family members, and speech therapists

5.7 Analysis of Combined Responses of Parents and Educators of Children with ASD Based on Communication Matrix

In this section, the analysis focuses on responses offered to the same questions asked in the questionnaire administered to the parents and the educators (N=52) of children with ASD who participated in the study. The questions, designed in Likert format had three options namely *Often, Sometimes, and Never* based on Communication Matrix. The responses answered part of the research questions in chapter one of this study especially by shedding light on linguistic and communicative performance of autistic children based on underlying neuron-cognitive and psycholinguistic nature of ASD. Each table shows the frequency and the percentage of the respondents and the graphical representation of each table follows.

5.7.1 Distribution of Responses Based on How Children with Autism Maintain Eye Contact while Talking to Parents, Educators, and Others

Table 5.62 illustrates responses on whether children with ASD maintain eye contact while talking to parents, educators, and others. While 2 respondents (representing 3.8%) picked often, 33 respondents (representing 63.5%) indicated sometimes, and conversely, 17 respondents (representing 32.7%) indicated never.

Will s/he look you or others in the eye when s/he wants something or when s/he is talking to you?	**Respondents**		
	Parents	**Educators**	**Total/%**
Often	2	0	2 (3.8%)
Sometimes	26	7	33 (63.5%)
Never	8	9	17 (32.7%)
Total	36	16	52 (100%)

Table 5. 62: Frequency distribution of the respondents based on how children with ASD maintain eye contact while talking to parents, educators, and others

5.7.2 Distribution of Responses Based on How Children with Autism Turn Their Head When Talking or Doing Things Next to them

Table 5.63 illustrates the responses on how children with ASD turn their head when talking or doing things next to them especially when parents, educators, and others called their names. While 7 respondents (representing 13.5%) picked often, 40 respondents (representing 76.9%) indicated sometimes. On the other hand, 5 respondents (representing 9.6%) indicated that this case never occurred.

Does s/he turn his/her head to look at you when you start talking to him/her or doing things next to him/her? When you call his or her name?	Respondents		
	Parents	**Educators**	**Total/%**
Often	3	4	7 (13.5%)
Sometimes	30	10	40 (76.9%)
Never	3	2	5 (9.6%)
Total	36	16	52 (100%)

Table 5. 63: Frequency distribution of responses based on how children with autism turn their head when talking or doing things next to them

5.7.3 Distribution of Responses Based on Whether S/he Turns His or Her Eyes to Avoid Looking at You When You Are Right in Front of Him/her

Table 5.64 illustrates the responses on whether children with ASD turn their eyes to avoid looking when their parents, their educators, and others are in front of them. The majority of the respondents 31 (representing 59%) picked sometimes, 20 respondents (representing 38%) indicated often. On the other hand, 1 respondent (representing 1. 9%) indicated that this case never occurred.

If you are right in front of him/her, does s/he turn his or her eyes to avoid looking at you?	Respondents		
	Parents	**Educators**	**Total**
Often	14	6	20 (38%)
Sometimes	21	10	31 (59.6%)
Never	1	0	1 (1.9%)
Total	36	16	52 (100%)

Table 5. 64: Frequency distribution of responses on whether children with ASD turn their eyes to avoid looking when their parents, their educators, and others are in front of them

5.7.4 Distribution of Responses Based on Whether S/he Will Look at a Direction to Show Him/ her a Toy or a Picture in a Book

Table 5.65 represents the responses on whether children with ASD turn their eyes to a particular direction their parents, their educators, and others point to for the purpose of showing a toy or a picture in a book. The majority of the respondents 45 (representing 86.5 %) indicated sometimes, 4 respondents (representing 8.0%) indicated often while 3 respondents (representing 5. 5%) indicated that this case never occurred.

Will s/he look where you point when you point to show him/her a toy or a picture in a book?	Respondents		
	Parents	**Educators**	**Total**
Often	3	1	4 (8.0%)
Sometimes	31	14	45 (86.5%)
Never	2	1	3 (5.5%)
Total	36	16	52 (100%)

Table 5. 65: Frequency distribution of responses on whether children with ASD turn their eyes to a particular direction their parents, their educators, and others point to for the purpose of showing a toy or a picture in a book

5.7.5 Distribution of Responses Based on the Possibility of Grabbing and Using Someone's Hand and Place It on Something Needed

Table 5.66 illustrates the responses on the possibility of children with ASD to grab and use the hands of their parents, and their educators like a tool, and place it on something they need. The majority of the respondents 35 (representing 67.3 %) indicated sometimes, 3 respondents (representing 5.7%) indicated often, while 14 respondents (representing 26.9%) showed that this case never happened.

Does s/he ever use your hand like a tool, grab it and place it on what s/he wants?	Respondents		
	Parents	**Educators**	**Total**
Often	2	1	3 (5.7%)
Sometimes	23	12	35 (67.3%)
Never	11	3	14 (26.9%)
Total	36	16	52 (100%)

Table 5. 66: Frequency distribution of responses on the possibility of children with ASD to grab and use the hands of their parents, and their educators like a tool, and place it on something they need

5.7.6 Distribution of Responses Based on the Possibility of Using Gestures to Draw Attention

Table 5.67 presents the responses on the possibility of children with ASD to use gestures to draw attention of their parents, their educators, and others. The majority of the 44 respondents (representing 84.6 %) indicated sometimes, while 2 respondents (representing 3.8%) indicated often as a response to the question. Conversely, 6 respondents (representing 11.5%) showed that this case never occurred.

Does s/he use gestures to draw attention?	Respondents		
	Parents	**Educators**	**Total**
Often	2	0	2 (3.8%)
Sometimes	30	14	44 (84.6)
Never	4	2	6 (11.5%)
Total	36	16	52 (100%)

Table 5. 67: Frequency distribution of responses on the possibility of children with ASD to use gestures to draw attention of their parents, their educators, and others

5.7.7 Distribution of Responses Based on the Possibility of Using Gestures or Words to Point at Something

Table 5.68 illustrates the responses on whether the children with ASD use gestures or words to point at something. While the majority of the respondents 38 (representing 73.1 %) indicated that such use of words or gestures has never occurred; 12 respondents (representing 23.1%) indicated sometimes as a response to the question. Additionally, 2 respondents (representing 3.8%) showed that this case occurred often.

Does s/he use words or gestures to express or to point at something?	Respondents		
	Parents	**Educators**	**Total**
Often	2	0	2 (3.8%)
Sometimes	8	4	12 (23.1)
Never	26	12	38 (73.1%)
Total	36	16	52 (100%)

Table 5. 68: Frequency distribution of responses on the possibility of children with ASD to use gestures or words to point at something

5.7.8 Distribution of Responses Based on the Possibility of Showing Emotional Expression like Smiling, Frowning, and Raising of Eyebrows in Surprise

Table 5.69 presents the responses on whether the children with ASD do show emotional expression like smiling, frowning, and raising of eyebrows in surprise. While the majority of the respondents 43 (representing 82.7 %) indicated sometimes; 2 respondents (representing 3.8%) indicated that such emotional expressions occurred often. Additionally, 7 respondents (representing 13.5%) showed that this case never occurred.

Does s/he show emotional expression like smile, frown, raise his or her eyebrows in surprise?	Respondents		
	Parents	**Educators**	**Total**
Often	2	0	2 (3.8%)
Sometimes	29	14	43 (82.7)
Never	5	2	7 (13.5%)
Total	36	16	52 (100%)

Table 5. 69 Frequency distribution of responses on whether the children with ASD do show emotional expression like smiling, frowning, and raising of eyebrows in surprise

5.7.9 Distribution of Responses Based on Showing Emotional Expression that Matches the Situation

Table 5.70 shows the responses based on whether the children with ASD in this study do show emotional expression that matches situation. The majority of the parents and the educators 41 (representing 78.8 %) indicated sometimes; while 3 respondents (representing 5.8%) indicated that such emotional expressions occurred often. Additionally, 8 respondents (representing 15.4%) showed that this case never happened.

Does s/he show emotional expression that matches situation?	Respondents		
	Parents	**Educators**	**Total**
Often	1	2	3 (5.8%)
Sometimes	28	13	41 (78.8)
Never	7	1	8 (15.4%)
Total	36	16	52(100%)

Table 5. 70 Frequency distribution of responses on whether the children with ASD do show emotional expression that matches situation

5.8.0 Distribution of Responses Based on Response Children with Autism Made When a Gesture or Facial Expression is used for Communication

Table 5.71 illustrates the responses on how children with ASD respond when their parents, educators, and others use a gestures or facial expressions to communicate with them. While 2 respondents (representing 3.8%) picked often, 42 respondents (representing 80.4%) indicated sometimes. On the other hand, 8 respondents (representing 15.4%) indicated that this case has never occurred.

How does s/he respond when you use a gesture or facial expression to communicate with him/her, e.g., when you shake your head “no” or frown?	**Respondents**		
	Parents	**Educators**	**Total %**
Often	1	1	2 (3.8%)
Sometimes	30	12	42 (80.7%)
Never	5	3	8 (15.4%)
Total	36	16	52 (100%)

Table 5. 71 Frequency distribution of responses on how children with ASD respond when their parents, educators, and others use a gesture or facial expression to communicate with the

5.8.1 Summary

The focus of the chapter was analysis of quantitative data which was obtained from the parents and educators of children with ASD. The chapter presented the questionnaire administered to the parents as well as another separate one for the educators. Both questionnaires were presented in the form of frequencies and percentages. The last part of the chapter also presented data obtained from the same set of questions answered by the parents and the educators. The next chapter presents qualitative data obtained from semi-structured interviews and class observations.

CHAPTER SIX

ANALYSIS OF QUALITATIVE DATA

6.1 Introduction

In this chapter, the focus is on the analysis of qualitative data obtained through semi-structured interviews conducted with the educators, speech therapists and pediatricians/ clinicians as well as from the class observations. The interviews conducted with the educators, speech therapists, and clinicians/ pediatricians are presented with the aim of providing thematic responses to some research questions stated in chapter one of this study which include whether ASD is common to a particular culture or not; and whether the linguistic and communicative competence of children with ASD has influence on academic performance of children with ASD. Another sub-section of this chapter also presents findings obtained from classroom observations. The significance of this chapter lies on the need to indicate different or related information obtained from the integration of mixed-methods which the use of one approach or data collection technique might not unfold (Thurmond, 2001). In this analysis, the views of the educators, speech therapists, and clinicians/ pediatricians are presented together when the same interview questions were answered by the above-mentioned participants. The same method of analysis is performed on interview questions answered by the educators and the speech and language therapists.

6.2 Overview of Sample

As indicated in Section 5.2.1, both quantitative and qualitative data were collected from the educators. While 8 educators were interviewed, 1 the speech therapist, and 1 pediatrician/ clinician were interviewed across RS1, RS2, RS3, and RS4 (that is, one per research site). The main criteria used for their selection as mentioned in Chapter 4 include having been working with children with ASD and their parents for the past 24 months, and their attainment of relevant educational and /or professional training. This personal information helps towards understanding if their years of experiences and professional dynamics may influence their understanding and dealings with language and communication of children with ASD in particular. In order to maintain confidentiality and other related ethical issues concerning the sampled participants, the following labels were used: EDU was utilized to denote educators; SLP was employed to denote speech and language therapists while CLI/PED was used to represent clinicians/ pediatricians. The results of the semi-structured

interviews are presented below and they are significant as the participants' views have the potential to shed light on the linguistic and communicative nature of these children and offer solution which may help enhance the language and communication of the affected children.

6.3 The Prevalence of Autism Across Culture

All the interviewed participants were asked whether ASD is common to a particular culture or not. The responses added answers to research question 1. All the participants explained that ASD is not prevalent in one culture than in another culture according to their views. Some of the respondents (EDU6; SLP1, SLP4, and CLI/PED2) said:

> I have not come across any information or found out myself that autism is common to a particular to a culture, even isiZulu culture or other culture which I know especially in South Africa. So, I can say that autism is not high in one culture than another culture…. (EDU6)

> I have been working as a speech and language therapist for some years and I have no statistics of how many children from a culture are having autism but I think autism is found in all culture and the rate may be the same. Culture has no way of increasing or lessening the number of people who can have or cannot have this disorder in my own view. (SLP1)

> ASD I feel is the same prevalence in the different cultures, but awareness of the diagnosis varies between cultures which results in different rates between the cultures. (SLP4)

> The issue of whether autism is common to a culture or that one culture has many children with autism to me is not true. I meant those who are seeking medical attention that I have attended to so far are from different culture and I cannot remember that a particular culture have more people with autism than another culture. What I know is that if you are living where people of a particular culture are many, it is possible to see many of them with autism than any other culture with a few people in the same location…. (CLI/PED2)

6.4 Learning and Usage of Bi/Multilingualism for Children with Autism

The majority of educators interviewed for this study indicated that one language is preferred for children with ASD. The responses added answers to research question 3. Only one mentioned that using bi/multilingualism is fine but reiterated that such usage depends on the languages in question. Three of the clinicians/ paediatricians also argued that using one language has more benefits like enhancing their linguistic and communicative competence on time. They emphasised that as ASD may persist for long, it is better to stick to whatever

intervention including language and communication that has potency of working as quick as possible. This same finding was obtained from parents as shown in Chapter 5. Many of them argued that exposing children to two or three languages is capable of increasing the burden these children with ASD are facing. Only two speech and language therapists indicated that using two or more languages would be based on the situation at hand and provision for such exposure and usage. The following excerpts in tandem were culled from the responses of EDU2, EDU4, EDU7, CLI/PED1, CLI/PED3.

> I have said it to even my colleagues that using two languages are not suitable for children with special needs especially autism. Do you know that exposing them to such one more language, I mean two languages can do harm to them? The will be more confused …

> From my experience, it is OK but it will also depend on what language respond to. One is here who flows with English and struggle with their language [L1-isiZulu]. I don't know how but I have noticed …. [she mentioned the name of the child]. He gets frustrated when you give him classwork in isiZulu. I can tell you most of them will do well with two languages depending on which language is dominant or a language which a child respond to. I like to use a language which a child responds to teach and communicate with him or her….

> In my own opinion, don't expose them to two or more languages. There is no way that won't affect them negatively. You wanted to help their language and communication, right? You wanted them to learn Arithmetic and other subjects and you think using two languages will help? I doubt it my brother. Even many of them are not picking anything in class by using one language, let alone two languages.

> I don't see the need to introduce or expose them to multiple languages which to me may hinder their cognitive process of their communication and other behavior.... Hope you understand my point. If it is isiZulu that parents speak well let that be used solely for the child…. Remember they are not typical children…

According to SLP3, the situation for two or more languages must be first understood, and provision for Augmentative and Assistive Communication (AAC) should be provided if there is a need.

> This depends entirely on the learner. If they are using an additional language to supplement their communication, for example sign language that must be understood. Many of our ASD learners come from Zulu homes, where English is not understood, but these learners

> have picked up English from the TV and are in English classes. These learners need to understand language in both environments. Many voice output like AAC devices are in English. If a child is identified as possibly needing an AAC device, they may need to learn English, so there is better access to AAC options.

Another speech and language therapist (SLP3) explained that:

> When many say that children with autism cannot do well with two languages, I tend to disagree to some extent as they usually mention it as a no going area. What I know is that parents and professionals should work it out for these children. I think it can work for them too….

6.5 Awareness Concerning how 'Theory of Mind' Affects the Linguistic and Communicative Competence of the Autistic Children

All educators were asked whether they were aware that 'Theory of Mind' (ToM) affects the linguistic and communicative competence of the autistic children or not. The responses added answers to research question 4 and 5. The educators and the speech and language therapists were asked the question as they (apart from the parents) have spent a larger number of hours and usually have much interaction with these children than any other caregivers. They were also assumed to be knowledgeable about Theory of Mind (ToM) due to their professional training. From the interviews, it was revealed that many educators and speech and language therapists had little or no understanding about the possibility of lack of ToM to affect the linguistic and communicative competence of children with ASD. According to the responses from EDU 7, EDU 3, EDU1, EDU4, EDU5, knowledge about ToM in relation to ASD was not taught during their studies, and they have not also learned about it since they started practising as educators and speech and language therapists of ASD children, and therefore had little or no understanding about the relatedness of ASD and this concept. Below are some of their responses. The first three were attributed to EDU7, EDU3, and EDU5.

> Eish…. [retort] I am sorry, I don't know about Theory of Mind and what it does to children with autism. You asked if it affects their language and communication…. Hawuu [exclaimed], I cannot say yes or no because I don't know about what that term means. (EDU7)

> I heard the term for the first time when I answered the question about it in the questionnaire. Before, I did not hear of it. See, no mention of such things at all when I was studying and when I have started this job, em, and teaching. So, it will be hard for me to define it or say how eeeehh…. [thinking] Theory of Mind may affect these children with autism and what other thing you said….em-em…[thinking] their language, and their communication…. (EDU3)

> How Theory of Mind affects the autistic children, and their language, hhhhhmmm…[thinking] it may affect them but I don't know how that can happen. I have no idea. I cannot remember any of the modules I studied mentioned or emphasised that concept. I have not also read about it after I left school…. So, no idea of what it does. (EDU5)

Another educator (EDU4) explained that the lack of awareness or knowledge of ToM was responsible for her inability (just like her other colleagues) to know whether ToM is capable of influencing the linguistic and communicative competence of children with ASD. EDU4 said:

> I am not aware of this concept, and I can say my colleagues don't know it too because if they know it, one would have mentioned it during one of our meetings or discussions. You can see now that we lack Theory of Mind knowledge and what it is as concerned our children with autism in this school.

Similarly, EDU1 emphasised lack adequate in-service training from the school he works with as the main reason for the inability of many educators including him to comprehend what ToM is and how it relates to ASD. EDU1 mentioned that:

> Aiybo…[exclaimed] I think we don't know this term you mentioned. I also don't know it. Truly during my study at higher institution, none of my modules and teachers said anything like that if am not forgetful. But let me say this, since we are not trained as on some complex matter that has to do with autism at both school and at work, it will be hard to answer whether that theory is good or bad for these children with autism.

SLP2 and SLP3 also gave their opinions thus:

> I have heard and read about it but I cannot say I truly know the extent in which absence or lack of Theory of Mind may affect linguistic and communicative competence of these children….

> While attending to the children I was not guided by that concept because I am not fully aware of what when these children lack it may cause them…. I mean maybe it is affecting their communication and language.

6.6 Disruption in Brain Connectivity and How It Affects the Linguistic and Communicative Competence of Children with Autism

When asked about how disruption in brain connectivity affects the language and communication of children with ASD, the majority of the participants declared that they had

little or no knowledge of disruption in brain connectivity. Some, especially the language and speech therapists, and the clinicians/pediatricians alluded to brain injury to answer the question posed to them. The majority of the educators revealed that they believed the disruption in brain connectivity has influence on language and communication of children with ASD. The significance of this question is based on some neurocognitive and neurolinguistic bases of ASD which if understood, can help the participants of this study render better caregiving services to these children. The most relevant responses are presented below, according to EDU8, EDU2, EDU3, and EDU5:

> …I believed such problem exist among our children with autism and it is maybe connected with how they use language or communicate. But as you mentioned it or let me say as you raised the idea, I believed it is so. (EDU8)

> Yeah [not surprised]. You explained it in the questionnaire and I cannot lie that I know much what about it so I read about it again and I can say brain can be linked to how they use language and how these children communicate. Ohhh [recollecting something], I don't know how much it affects these children in any way including their language and communication. (EDU2)

> Yes, it is possible but I cannot say how it be so. I should confess that I have no idea that when brain is disturbed can also be linked with what children with autism are suffering from…. Did you get my point? I don't know much about this topic…. (EDU3)

> Really, I have no valid opinion about whether this brain issue is also affecting children with autism here. What point am I making is that I cannot say yes or no because I have no knowledge about brain disruption and connectivity…. (EDU5)

Conversely, EDU6 seemed to link the linguistic and communicative patterns as well as social behaviours of these children to how their brain function. EDU6 said:

> Yes, I think their brain is not fully functioning as it should be for a normal child. Some of their behaviours denote that something is wrong

> possibly in the brain…. And that may also be part of the problem they face in communicating.

SLP1 and SLP4, and CLI/PED3 explained respectively that:

> You see, in my opinion, this issue is usually said to be linked with brain damage and that alone can affect language ability of these children. So, when that happens, there will be problem with communication, and that is why we must help them…

> I know that in aphasia, brain issue is common, so this may be another disorder where one may link brain injury or damage of the brain. I am not sure assessment of brain is conducted for children with autism but if they have problem with their brain, it may affect their language and communication.

The finding according to the above excerpts indicated that the majority of the participants had no knowledge about disruption and connectivity of brain among children with ASD.

6.7 Types of Common Challenges Children with Autism have in Word Use and Sentence Structure

The question regarding types of common challenges children with ASD experience concerning word use and sentence structure was posed to educators and speech and language therapists who participated in this study. The majority of them mentioned that a few verbal children among those they have been taking care often used one word to respond to a request as if they were at the holophrastic stage of their language development and no ample trace that the children were bilingual as their one-word utterances were mostly in their L1 (mostly isiZulu). All of the participants revealed that in many occasions, words used were out of context and that most words were used in combination with noise that imply (dis)approval, anger, and excitement. The educators and the speech and language therapists who participated in this study also indicated that children with ASD have a profound difficulty in making sentences. Some of the responses highlighted below reflect the participants' views.

> I have not seen any of them using many words or having a normal sentence structure because they did not form sentences from those few

> words…. I think this inability is part of what makes autism different from some childhood disorders…. (EDU8)
>
> Many of them don't speak as I have noticed…. Another thing among children with ASD as I have noticed is one word. They are using one word to represent many things or objects whether they relate or not in most cases too…. (EDU 5)
>
> The sentences they are usually taught range from three to five-word sentences, new words, and phrases… But it seems they quickly lose what they have learned that within a few days, the word arrangement will be extremely disorganised and thus become meaningless.

One of the speech and language therapists also emphasised that children with ASD who are verbal should not be expected to match those without the disorder because some may even experience language loss.

6.8 Types of Common Grammatical Errors that are Prevalent among Children with Autism

The educators and the speech and language therapists were asked about the grammatical errors such as tense usage, subject-verb agreement, and pronoun among children with ASD in their L1 or L2. This question is relevant to those who were verbal among the children with ASD. The majority of the educators and the speech and language therapists mentioned that these children have difficulties in using tenses, identifying when tenses have been changed in conversations, failed in most times to use correct verbs and their corresponding subjects. These participants also mentioned inappropriate use of prepositions and first-person pronouns whereby 'I' (as in, I go; I sit; I eat...) and second person 'You' (as in, You stand; You sit…) dominate their sentences or conversations, and understanding sentences with reflexive pronouns such as 'Sma kicks herself'; 'were also found ambiguous and difficult to ascribe appropriate meaning.

6.9 Extent of Articulation, Writing, and Reading of Children with Autism

Another question posed to educators and speech and language therapists of children with

ASD centered on articulation, writing, and reading among children with ASD. The participants revealed that articulation problems persist among those children with ASD who are verbal. The majority of the participants mentioned that the articulation difficulties range from syllables, one word, to phrases and simple sentences. The biggest articulatory problem mentioned by the participants is paying attention to sound or any other auditory information, which usually made the children to pronounce sounds incorrectly. Some of the explanations made by the participants are presented below.

> I have noticed that many of these children usually find it difficult to produce bilabial sounds in either their home language or in English language. I understand Afrikaans and English, and I have noticed /p/, /b/, and even /m/ pose problem for many of them. Some may not be able to detach their upper and lower lips or bring them together (SLP2).

To SLP3, the delayed velar explosive sound in isiZulu and voiced velar sound in English have been found to be difficult to articulate by children with ASD. SLP3 mentioned that:

> I know a few of them who have picked some words in isiZulu but articulating letter /k/ and which sounds as [ġ] in isiZulu and [g] in English whether in isolation or in a word is hard for them….

One of the educators (EDU7) whose L1 is isiZulu also added that it is extremely hard for a child with ASD to learn clicks. She stressed that the difficulty with clicks among the children with ASD is regardless of their position like dental represented by letter /c/, /ch/, /gc/, /nc/, /ngc/; palatal-alveolar position represented by /q/, /qh/, /gq/, /nq/, and /ngq/; and alveo-lateral position represented by /x/, /xh/, /gx/, /nx/, and /ngx/. EDU7 explained that:

> Yeah [paused a while before answering]. Articulation problem which I have noticed among children with autism includes clicks. Making click sounds or reading letters representing clicks is very hard, very hard….

Regarding reading and writing, the majority of educators and speech and language therapists believed that the majority of children with ASD had challenges in their reading and writing. These participants revealed that lack of different reading and writing skills noticeable among typically developing children are missing among children with ASD. This challenge may be aggravated by difficulties in coordinating or organizing themselves as well as motor

problems. Few of the responses are as follows.

> Only a few can write when the teacher dictate and monitor it. And remember it is common to use one or two-word communication like *Phumla toilet*. I also have to point and hold their hands… (EDU5)

> Holding a pen is a challenge. So they can't write because of problem of fine motor. (EDU8).

> Reading and writing without interest and concentration is part of the challenges I have noticed among them. It is also like write what you see and not what you have an understanding (EDU3).

> There is one child in my class who is fluent in isiZulu and English and he can read. And another one among them does write. It is reading with pictures and in most cases. When they read, they have no understanding of it in real sense as they may connect what they have read to something different from what the text or picture is about. They, mostly link the meaning of what they have read to what their mind has brought them (EDU7).

Two of the speech language therapists that participated in this study shared similar views about the extent in which children with ASD can read and write. They emphasised that it is not easy to say they understand what has been read if at all they read, while their letters are wobble and /or sloppy.

6.10 Methods or Strategies Used as an Educator or as a Speech and Language Therapist to Teach and Improve the Language and Communication Deficits of Children with ASD

All educators and speech and language therapists involved in this study indicated similar methods they were employing to teach and improve the language and communication of children with ASD. The therapists SLP1, SLP2, and SLP4 mentioned various strategies, and their excerpts are respectively presented below.

> Providing them with alternate means of communication (picture cards etc.), can help with behaviour, if they have a means of communicating. Providing choices (helps with behaviour and language). I also use modeling language. Behaviour can be sensory, so finding out what triggers learning among them is important. (SLP1)

> I like to develop routines and schedules that are linked to learning particular concept or aspect of language and communication…. (SLP2)

> Teaching them language and communication is not as easy like that, so using visual materials are much common. As I am independent speech and language therapist, I have Tablets and Laptops for providing audio-visual engagement with them. Sometimes social stories are used to teach them. It requires enough demonstration before few of them can really get what you are saying. (SLP4)

The majority of the educators also mentioned the use of pictures and sign language. Parts of the relevant responses mentioned include those from EDU2, EDU3, and EDU5 below.

> Yes, part of the methods of I have been using is sign language and pictures. I normally use items that these children can see at home because some of them are from rural areas and the family is not rich. I myself, I always start with something that the child will be able to use at home. So, using electronic gadget and they get home where they don't have it, it is nothing. (EDU2)

> …to teach them and motivate them to speak or communicate [chuckles], I and others use sign language, pictures, and body language. We also use play-to-learn method, and singing is much easier to learn. TV can also be used. (EDU3)

> I look for strength. The strength of my kid with autism is reading. And I will work on that because one of my kids in this class actually likes reading and does it well. In terms of language improvement, music have proved to increase their language as what they love what they are singing see and trying to talk it. Ironically, television also improves their language. One of my kids I remember last year one of these children watched something on TV, about idols last year…I have to devise entertaining him for about 30 minutes on idols and he hasn't been speaking before then. After that, he keeps on watching the media and he can say or identify the president, the mayors, identify soccer players. He watches channel on DSTV and teacher has to keep that up with him because that method works for him. (EDU5)

The educator (EDU5) also mentioned the use of demonstration as another strategy that has worked for some of her learners with ASD. She said that because these children are learners that respond to visuals, even the one you know as a smart one needs demonstration to understand what needs to be done like how to wear a face mask at school and at home.

6.11 Autism and Its Influence on Academic Performances of Children Diagnosed with Autism and What may Work Well for them

This section presents responses to the question on the influence of ASD on academic performance of children diagnosed with ASD as well as what the educators and the speech and language therapists think may work well for academics, language and communication of children with ASD. All the participants concurred that ASD has profound influence on the academic performance of children diagnosed with ASD. The responses of some educators are presented below.

> Yeah, the burden of ASD…[digressed] in fact it is not having a good impact on their academics. It is not making them to learn in the way we want them to learn. When you receive a 10-year-old child in school…. you will begin to think where to start with he or she as parents have held them at home for long even after some were diagnosed early. So, the child will be doing nothing at home than behaving anyhow because they will be treating or teaching the child like a normal child… that will not work well for the child. Some may bring their child out when she or he is 15, and that can lead to severe impairments (EDU1).

> Yes, it does because they hardly function well like those without autism…. Yeah, another issue that makes it affect their academic performance is intervention at home. Those who have late diagnosis and intervention may not be able to perform averagely in their academics. That means the lack of early intervention intensifies poor academic performance of those who are autistic. The child will be affected…there are autistics out there who can study until Grade 12 but not in this school. I have seen some here that intervention would have made a lot of changes in their life. But many parents don't know about autism, they only say the child is being naughty, disrespectful…It is sad especially in our community where some believe in ancestral whatever…. (EDU 3).

> I will say yes. A child with autism may not feel like doing what you ask them. In that way, it will affect their academics. If a teacher can accept that, be patient, and tolerate them it will affect the academic positively and it will work well for the child.

Similarly, some speech and language therapists who participated in this study believed that

the burden of autism especially on those children who had received ineffective intervention, late intervention, and getting admission to school at older age may definitely affect the intelligent quotient, verbal mental age, and interest in academic tasks. They also believed that those aforementioned issues will definitely work well for attaining linguistic and communication competence, cognitive-behavioural enhancement and better academic performance if addressed as early as possible. SLP2 explained thus:

> It has a great effect especially negative effect on their academic performance. Many can't express ideas, and express a situation at all. With no speaking, writing, and no reading, it is difficult to accelerate teaching them different things. You have to follow a kind of routine. A routine that was forced on educators and people like us….

SLP4 also revealed that ASD adversely affects the academic performance of all children with ASD she knew. SLP4 added that due to issues like the problem of articulation, lack of theory of mind or problem of remembering things, problem of language processing and communication, understanding social interactions as well as social context and lower cognitive ability; the academic performance of the majority of these children tend to be poor. SLP4 added what may work well for the children with ASD thus:

> Parental support is vital as well as educators who understands the disorder and who can work effectively with these learners

6.12. Results from Classroom Observations

The results derived from classroom observations followed the field notes and observations made about classroom practices that were relevant to this study. Importantly, the teaching strategies the educators adopted, and instances of communication among autistic learners and those initiated by their educators were observed. Based on the physical interactions and conversations between the educators and the autistic learners, it was found that the majority of the autistic learners in this study were non-verbal, and their educators communicate with them using verbal. Sign languages and non-verbal cues like pointing, demonstrating, showing diagrams/ pictures, flash cards, colourful dice, counters and other visuals were the main teaching strategies employed. It was also found and confirmed by the educators that topics being taught these learners were simpler than what their age-matched typically developing children would be exposed to, and still the majority of them only assimilated few concepts in an extremely slow pace. Most educators employed their L1 (isiZulu) as a medium of

instruction, and only few used more than a language to explain concepts and instruct autistic learners in their classes. Repetition of certain concepts, and topics were also observed.

In addition, the majority of the autistic learners observed displayed some features of learning disability such as slow and poor assimilating of simple topics which might be responsible for their poor academic performance. It was observed that many autistic learners who were said to be verbal could not articulate words, phrases, and simple sentences when written on board or used during question, request, command, and other form of simple discourses. The majority of the autistic learners observed found it difficult to read and write even when the majority did not have motor skill problems.

Moreover, it was also observed that the educators found it necessary to relate and communicate with the autistic learners during lessons and during other class activities using simple words coupled with non-verbal communication strategies and visuals. However, the majority of the learners did not grasp the grammatical, pragmatic and semantic aspects of both verbal and non-verbal language used by the educators. It was discovered that the autistic children have varied degree of difficulty in semantics, pragmatics, grammar, and in inferring mental state as the majority of their responses were incorrect, out of context, filled with pauses, and the use of one word and body language (especially nodding and pointing) dominated their communication.

6.13 Summary

This chapter highlighted the results of the interviews conducted purposely to evoke information from the educators, the speech and language therapists, and the clinicians/pediatricians who were recruited for this study. The interviews enabled the participants to give deeper insights into some questions already asked in the quantitative part as well as new other ones mainly designed for qualitative design. While the majority of the questions were answered by the educators and the speech and language therapists, some questions were answered by all the participants in the qualitative section.

The responses gathered from the qualitative data revealed similar and dissimilar findings from those obtained from the quantitative data as applicable to each question asked. The interviews revealed that the participants did not believe that the prevalence of ASD differs

across cultures; but confirmed that ASD has profound negative influence on the academic performance of the affected children; and that children with ASD also have difficulties in articulating certain sounds, syllables, words, phrases as well as in reading and writing. The chapter also found that an integrated sets of strategies like the use of visualization of everything, understanding what works better for each, earlier diagnosed and intervention as well as exposing the children with ASD to school early may work well for better academic performance as well as enhancement of linguistic and communicative competence. In the next chapter, the discussion of major findings is presented.

CHAPTER SEVEN

DISCUSSION OF MAJOR FINDINGS

7.1 Introduction

This chapter presents discussion of the main findings from both quantitative and qualitative data obtained through the questionnaire, semi-structured interviews and classroom observations. These major findings concern language and communication of children with ASD and some associated issues. ASD is a neurodevelopmental and lifelong disorder with main characteristics that include difficulty in having functional speech, social interaction, and communication. Notably, two people with ASD cannot portray all symptoms the same way; therefore, the extent of burden of ASD on affected individuals tends to be unequal, and the level of severity of their impairment may correlate with the effect of this disorder on cognitive, behavioural development, as well as on language and communication competence, academic performance, and social interaction.

In this chapter, the discussion of findings is systematically constructed and it pays attention to information on respondents' demography, the respondents' views on various questions derived from the study's objectives and research questions. Succinctly, the discussion of major findings concerns language and communication of children with ASD, the prevalence of ASD among cultures, whether ASD has certain influence on the academic performance of children with ASD, whether children with ASD can be exposed to or raised with bi/multilingualism; the need for a model to increase understanding of ASD which in turn may help all caregivers especially the parents, the educator, and the speech and language therapists in KwaZulu-Natal, South Africa.

In the process of discussing the major findings, the researcher endeavoured to make connection between the findings, the initially set research objectives, and research questions. Ensuring such connection between these research parts is essential to establish whether the research does not deviate from its original aims; and whether the research questions, objectives and findings fit into each other at the end of the study. Discussion of research findings means interpreting research results which in turn aids in comprehending the information obtained from the respondents due to possible difficulty in ascribing meaning to the information (Miller & Brewer, 2003). Similarly, Daniel and Sam (2011) asserted that

researchers are expected to associate whatever results obtained in their study with findings of similar studies purposefully for identifying areas of gap and correlation. Based on this import, some theories employed in a research study serve as another means of explicating realities, and to add to body of knowledge. In this chapter, the study's findings are discussed and interpreted according to research questions stated in chapter one, and as linguistic and communicative issues and other related ideas surrounding ASD discourse in South Africa.

7.2 Demographic Characteristics of the Research Respondents (Parents and Educators)

In this section, the concern is to describe the demographic features of this study's participants. Two sets of questionnaires were designed (i.e., one for educators, and another for parents) and administered physically to the respondents in four selected research sites in KwaZulu-Natal. The sum of 60 questionnaires were administered, but due to COVID-19 pandemic and its effect on people, 41 copies were returned, and thereby accounted for 68.3%. However, 36 copies were valid for analysis except in Part A of the questionnaire designed for the parents where 35 copies were analysed due to multiple answers provided by one of the parents in that part. In addition, eight (8) educators, four (4) speech and language therapists, four (4) clinicians/ pediatricians who were also rendering one service or the other to children with ASD for the past 24 months or more were recruited for the qualitative part of this study.

The researcher also gathered data through classroom observations, and the data obtained from the interviews and classroom observations (presented in chapter six) have added deeper perspectives to the data obtained from the quantitative aspect presented in chapter five. Intentionally, only relevant demographic indices of only participants recruited for the survey part of this study are focused on. For the educators the indices are age, gender, year of teaching experience with children with ASD, academic qualification, number of languages with proficiency, and name of language(s) used for teaching children with ASD. The demographic indices of the parents are age, gender, employment status, level of education, age of their children with ASD, and age in which each child with ASD was diagnosed.

7.2.1 Age Distribution of the Respondents

The age distribution of parents of children with ASD presented in Table 5.3 indicated 3 age intervals, which are: 21-30, 31-40, and 41-50. It can be inferred from the table that most of the parents of children with ASD are below middle-aged which are individuals aged between

45 and 65 years. Similarly, it is significant to note the age of children with ASD in this study based on the information supplied by their parents. In Table 5.7 the age interval of children with ASD are 0-5, 6-10, 11-15, 16-20, and 21-25. The majority of children with ASD were within 6-10 years; while those within 11-15 years age interval came next. The age of children with ASD is significant in giving insight about the age they were diagnosed as shown in Table 5.8. The table shows that the majority of these children were diagnosed at the age bracket of 4-6 year, while those within the age bracket of 7-9 years came second on the list. This study's result implies that age at diagnosis of the majority of children with autism range from 4-6 years (i.e., 48-72 months).

Typically, a child with ASD can be diagnosed at 18 months (Osborn, 2018; Hyman et al., 2020), but this is not common across the globe. The global mean age of diagnosing ASD, according to Daniels and Mandell (2014), ranged from 38 and 120 months between 1990 and 2012; and as crucial as age of diagnosis is, early identification and early treatment of ASD (Rogers et al., 2014) cannot be overemphasized. A systematic review and meta-analysis conducted from 2012 to 2019 by van't Hof et al. (2020) focused on the mean or median age at diagnosis in 40 countries that involved 120, 540 autistic individuals, 1150 articles, including 56 studies as well as results from 35 countries where meta-analysis on 35 studies and 55 cohorts and 66, 966 autistic individuals revealed a range of 30.90 – 234.57 months, and a mean age at diagnosis of 60.48 months. Similarly, an analysis on the subgroup studies (i.e., 9 studies with 26 cohorts across 23 countries that involved 18,134 autistic children below 10 years reported that diagnosis age ranges from 30.90–74.70months, and 43.18 months as a mean age at diagnosis.

The results obtained in this study have revealed that the age range for diagnosis is in par with the most part of the world. In the context of this study, early detection and early diagnoses are crucial to an improved language and cognitive capabilities at a later stage of life, and help in ameliorating the main symptoms of this disorder (Clark et al., 2018; Dawson & Burner, 2011). Table 5.4.2 shows that the majority of the educators were below the middle age, and therefore implies being young.

7.2.2 Gender Distribution of the Respondents

Based on information in Table 5.2 the majority of the participants were female. The above results show that a higher percentage of women than men was obtained across all research sites, and implies that women are more available and responsive to what concerns their children with ASD than men. While female versus male ratio among the educators may not

have any significant effect on the training of children with ASD; these results confirmed the notion that many studies have only concentrated on mothers of children with ASD with only few on fathers (due to their unavailability). Mothers, unlike fathers of children with ASD, have been investigated by the majority of studies that reported the elevated stress level of caregivers of children with ASD (Pisula, 2011). In a study that comprises mother and father of children with ASD, the number of male participants is usually small (Alli, Abdoola & Mupawose, 2015). The unavailability of fathers that this current study found can also be linked to elevated stress level of mothers of children with ASD (see Kehinde, et al., forthcoming) and such condition may influence the age of diagnosis, amount of quality time being spent with children with ASD and in turn exposing these children to two or more languages and teaching them social communication a difficult task.

7.2.3 Employment Status Distribution of the Respondents

Table 5.4 presented the employment status of parents of children with ASD, and the result shows that the majority of the parents were unemployed. This result indicates interconnection between ability to afford the cost of diagnosis and diagnosis age as many unemployed parents without financial support may find it difficult to present their children with ASD early for diagnosis. They may also find it difficult to give their children adequate intervention due to lack of money. A similar view was shared by Carlon et al. (2013) and Smith and Antolovich (2000) that the second factor influencing parental decision-making for ASD interventions is funding. Some parents have attested to increment in spending for their children with ASD unlike their typically developing children for whom they spend less on. Montes and Cianca (2014) similarly reported that in the USA for instance, raising a child with ASD costs double. When a parent or both parents of children with ASD are unemployed therefore, the financial burden can add up to their elevated stress, late diagnosis, cheaper or wrong intervention which in turn may lead to poor cognitive, linguistic and communicative skills. In this study, some speech and language therapists reported financial inability of numerous parents of children with ASD to hire private professionals to augment regular training these children receive at their respective schools.

7.2.4 Level of Education of the Respondents

These results present the education of the parents and the educators of children with ASD accordingly. Table 5.5 shows the academic level of the parents who participated in the study. The result shows that the parents had varied levels of education ranging from matric to postgraduate diploma. These results are significant for linguistic and communicative competence of children with ASD. Although the majority of the parents with reasonable level of education found it difficult to understand ASD, and how to inspire their children to acquire social communication skills and some basic linguistic skills, showing that most parents relied on educators and speech and language therapists offering services to their children with ASD.

The level of education of the educators is also significant to their experience, teaching performance, teaching methodology and teaching of social communication as well as the core subjects and concepts in their curriculum. During COVID-19, when schools (including special schools were shut); the researcher learnt that some special schools through their educators devised some creative ways to prepare some teaching materials, taught the parents of children with ASD with the expectation that these parents will teach their children. The next section discusses other significant findings that emerged from the study.

7.2.5 Years of Teaching Experience

The educators of children with ASD were asked about the years of their teaching experience, and Table 5.4.3 reveals that the years ranged from 2-4, 5-7, and 8-10. The majority of the educators had 2 to 4 years' experience in teaching children with ASD while those with 5-7 years' experience ranked second. The essence of years of teaching experience is its influence on strategies adopted for teaching social communication/ skills as well as other concepts in the curriculum used for these children with ASD. While those with teaching experience above 5 years were with suitable teaching strategies, like many other educators, and almost all parents in this study; their knowledge about aspect such as ToM, disruption in brain connectivity, language acquisition and comprehension (the use of bi/multilingualism) was low.

7.3 Discussions of Main Results from the Questionnaires and Interviews

This section comprises responses of two sets of questionnaires by parents and educators, as well as responses to the interviews by few educators, speech and language therapists and

clinicians/paediatricians. These responses help garner deeper insights into various questions that this study attempts answer. The findings are a mixture of responses obtained from quantitative and qualitative data but presented thematically with some subsections that cover a gamut of issues under sub-headings.

7.3.1 What is the Current Trend in ASD in KwaZulu-Natal and Its Prevalence among Culture?

The above question which is directly linked to Objective 1 of this study was answered in the survey and the interviews conducted for this study. Concerning the current trend in ASD, Table 5.9 shows that learning disability was identified as the highest additional issue among children with ASD as indicated by the parents. While 1 parent mentioned physical disability and a sensory impairment as additional issues her child with ASD had. The sampled parents indicated that their children required more intervention for both learning disability and physical disability or sensory impairment. What the researcher observed during classroom observations whereby some children with ASD were noticed to have displayed intellectual and learning disability corroborates these results. These trends correlate with one of the comorbidities of ASD stated by Bakare et al. (2009a).

Regarding ASD's prevalence among cultures, Table 5.3.4 reveals that the majority of the parents disagreed and only few of them strongly disagreed that ASD is common in some cultures than in others. Conversely, some of the parents agreed and strongly agreed. From the interviews conducted with the educators, speech and language therapist, and pediatricians (see chapter 6), all the participants explained that ASD is not more prevalent in one culture than in another, and some of them believed that culture may influence many decisions parents of children with ASD make before diagnosis, after diagnosis and for the rest of their lives. In this study, it was noted that cultural belief of people may influence the manner and time of diagnosis of ASD but not that culture literally increases the rate of ASD. This suggests that all the participants in this study believed that ASD is not more prevalent in one culture than in another one (see section 5.3.8, and 6.3).

Notably, when people of a particular culture have knowledge of ASD, they tend to present their children for diagnosis massively than people of the culture that does not have such knowledge or awareness (see Bakare et al., 2009a). People with views and cultural beliefs that ASD is nothing more than another childhood sickness may not present their children for

earlier assessment and intervention on time (see Bakare et al., 2009a; Daley, 2002; Mandell, & Novak, 2005), and that is tantamount to lack of focusing on how to scientifically enhance the language and communication of these children as their parents or caregivers may not bother finding help from professionals such as clinicians/pediatricians, speech therapists, and educators of children with neurodevelopmental disorder like autism. Additionally, regarding development of ToM (especially in developing false beliefs), gender and culture have also been used to explain some differences noticeable across cultures (Halmiton, Hoogenout & Malcolm-Smith, 2016; Liu et al., 2008; Peterson, Wellinton & Liu, 2005).

Another trend is people's perspectives to ASD and culture in KwaZulu-Natal in relation to whether witchcraft, spiritual or supernatural cause could be linked to ASD. The finding is based on the quantitative data where the majority of the parents disagreed that ASD is caused by witchcraft or other spiritual problems. Conversely, some of the parents agreed and strongly agreed. This finding negates Bakare's (2009b) report that many people in Africa commonly link ASD to witchcraft, spiritual or supernatural causes, though the finding of this study cannot be generalized to cover the whole African continent or beyond. Despite this current finding, people's lack of knowledge about ASD coupled with their belief in spiritual or supernatural healing may also lead them to seeking such help against this disorder. This result aligns with what Bakare and Munir (2011a) reported concerning the tortuous paths that many families of children with ASD take to seek help or healing for their affected children.

7.3.2. How Autism is Being Diagnosed, and how Satisfied are Parents with the Support or Intervention Received, and what Communicating Methods are Being Employed to Interact with Autistic Children?

The information supplied by the parents in the survey covered Objective 2 of this research. Where relevant, the interviews conducted for the speech and language therapists and clinicians/pediatricians are used to corroborate the results obtained from the survey. Section 7.3.2.1 below briefly discusses how diagnosis is being done, and the level of parents' satisfaction with the support or intervention they received from various professionals.

7.3.2.1 Method of Diagnosis and Level of Parents' Satisfaction with the Support or Intervention Received

The parents indicated different support they received (including diagnosis from professionals

such as developmental pediatricians, child neurologists, child psychologists, and child psychiatrists mostly at General Hospital and from Child and Adolescent Mental Health Services) and other support from speech and language therapists, occupational therapists and educator. Specifically, support in this sense suggests a range of services provided by the professionals caring for children with ASD. Based on the information supplied by the participants, the most common method of diagnosis ASD in KwaZulu-Natal is the use of DSM-IV criteria. What was important to the participants is confirmation that children under their care have been certified as autistic and that the affected children have difficulty or deficit in the aforementioned areas of social-communication with specificity in verbal or non-verbal communication, reciprocating emotional or social interaction, and creating, developing, and maintaining relationship (American Psychiatric Association-APA, 2013).

Additionally, the parents received various interventions in the form of support as shown in the survey, and they expressed the level of their satisfaction or dissatisfaction. Table 5.17 showed that the majority of the parents were satisfied and many others were very satisfied about the support they received from General Hospitals and others were unsatisfied. Table 5.18 also revealed that the majority of the parents were not using the services of speech therapists and thereby were not receiving support from them. The majority of those using them were satisfied. This same result was received from the parents' responses on the level of satisfaction they received from occupational therapists. Furthermore, in Table 5.21, the majority of the parents mentioned they were not receiving support from physiotherapists. Conversely, those who were receiving support from these professionals were satisfied with the support they received. Similarly, Table 5.22 discloses that the majority of the parents did not have basic opinion about any support received from social workers, and it seemed they misconstrued social workers for people working for non-governmental organisation on ASD. Table 5.23 presents information supplied by parents of children with ASD regarding support they received from special school. While the majority of the respondents were satisfied, those who were unsatisfied were fewer.

In the context of this study, the findings imply that the majority of parents received diagnosis for their children with ASD and some support from General Hospital. According to related views from two of the clinician/pediatricians that participated in this study, most medical personnel especially the pediatricians have added different support and intervention to people with ASD due to lack of specialized clinics and medical experts. Additionally, the finding

also shows that the majority of the parents are not using the services of occupational therapists and speech and language therapists. These results confirm lack of parents' knowledge about ASD as recorded by some studies like those that investigated parents' knowledge and views about ASD (Alli, Abdoola & Mupawose, 2015; Wetherston et.al, 2017). Also, parents' inability to afford the services of professional speech and language therapists may delay interventions that have potential of inhibiting social communication and interactions. This is against the documented benefits that having speech therapists caring for children with ASD may not be known to the parents due to their knowledge on ASD. The benefits include enhancing communication of children with ASD through the use of conversation and games that are appropriate for their age (Alli, Abdoola & Mupawose, 2015; Lachman, 2020). The nonverbal children with ASD can also benefit from varied alternative communication methods as well as gestures, and sign language; the use of a picture exchange communication system (PECS), sound producing device with digital apps, and working on muscles in the mouth, jaw, lips, and through massaging and strengthening to enhance developing expressive and retentive language ability (Lachman, 2020).

Based on Table 5.23, the results imply that parents of children with ASD are receiving support from special schools in KwaZulu-Natal than from the physiotherapists, the social workers, and the speech and language therapists. During the classroom observations conducted by the researcher, it was learned that many parents handed-down their children to school late and thereby making any education interventions difficult and extremely slow. Many educators in the interviews indicated that many of the parents at home failed to complement efforts being made by the schools and or the educators who are providing education services to children with ASD. Such situations suggest that it will be hard to enhance language and communication (linguistic and communicative competence) of these children with ASD. The inability to enhance linguistic and communicative competence may be aggravated by inadequate knowledge of these parents about the ASD and their lack of finance and or absence of enough professionals like speech and language therapist. In addition, those parents who were dissatisfied with the services or support rendered by the school may be those who with basic knowledge about ASD and high expectations of seeing tremendous improvement in the social communication and behaviour of their children with ASD

7.3.2.2 Communication Methods Being Employed to Interact with Autistic Children

This section discusses briefly the findings on major communication methods employed to communicate with children with ASD even though the majority of them in this study were observed and confirmed as nonverbal. In the survey, both the parents and the educators answered the same questions and their results were represented in the same tables in chapter 5. Some related responses from the classroom observations and interviews were also captured in chapter 6 and they are also used to further explain the findings. From the interviews and classroom observations, the majority of the children were non-verbal, therefore, the methods of communicating with them were largely sign language, and verbal communication combined with sign language, though understanding the meaning of both sign and expressive languages are also difficult for many of these children. This claim is corroborated by some studies (e.g., Nasim, 2013; Beakadi 2006), including some responses obtained from the interviews (e.g., section 6.8 of chapter 6). It has been reported however that some children with ASD whose IQ is high and with lower social impairment can eventually acquire language skills (Autism Speaks, 2013). This suggests that making children with severe ASD to become competent in their mother tongue or training them to become bi/multilingual will remain a herculean task even if there are no early interventions.

Relatedly, some survey questions focused on nonverbal communications with or by children with ASD, and thereby offer insight to a series of nonverbal communication methods. Other relevant interview responses are added to give in-depth views. In Table 5.62, the majority of parents and educators (33 (65.8%)) confirmed that most of the children with ASD in this study occasionally (sometimes) maintain eye contact while talking to parents, educators, and others; and conversely, 17 (32.7%) of them indicated that they never. Importantly, eye contact is capable of providing a novel idea on how children with ASD select their visual preferences in reaction to receptive language and to note the gaze of these children with ASD (Boraston & Blakemore, 2007; Chawarska et al., 2010; Klin et al., 2002; Pelphrey et al., 2002). In Table 5.63, the majority of the parents (40 (76.9%)) indicated that sometimes, their children with ASD turn heads when talking or doing things, or when their names are called. Also, some parents and educators (7 (13.5%)) said the children often perform the said action. Alternately, 5 (9.6%) of the participants indicated that this case has never occurred. This result also corroborated what some studies have confirmed that communicating nonverbally through facial expressions, eye contact, and gestures is difficult for children with ASD (Agostini,

2014; NIDCD, 2020).

In Table 5.64, the majority of the respondents said children with ASD turn their eyes to avoid looking when their parents, educators, and others are in front of them. Similarly, in Table 5.65, the majority of the respondents indicated that children with ASD sometimes turn their eyes to a particular direction when their parents, their educators, and others point to for showing a toy or a picture in a book. In Table 5.66, the majority of the respondents indicated that the use of hands of parents and educators like a tool by placing it on something they need is another method of communication, but it only happened sometimes. Table 5.67 shows that the majority of the respondents believed that children with ASD use gestures sometimes to the draw attention of their parents, educators, and others. In Table 5.68, the majority of the respondents indicated that the use of words combined with gestures to point at something or to communicate has never occurred. Furthermore, some few respondents indicated that this happened sometimes while 2 respondents showed that this case occurred often. These findings are in line with Agostini's (2014) and Salvatore's (2018) report that children with ASD may not show concern or look at someone talking to them or showing them something.

From the interviews, some educators also confirmed using sign language, pictures, and body language based on their understanding that many children with ASD in their classroom were nonverbal. Another educator mentioned that some of these children imitate what their educators and their verbal classmates said or pointed at, thereby influencing how these children produce words and communicate. This same case was confirmed during the classroom observations. These results confirm the earlier claim that a larger number of children with ASD whose parents and educators participated in this study are nonverbal as some studies have established also that sizeable number of children with ASD are not verbal (Tager-Flusberg, Lord & Paul, 2005; Tager-Flusberg & Kosari, 2013).

In Table 5.69, the majority of the parents and educators indicated that children with ASD do sometimes show emotional expression like smiling, frowning, and raising of eyebrows in surprise; while fewer respondents showed that such emotional expressions do occur often. Similarly, Table 5.70 shows that many children with ASD in this study do show emotional expression occasionally as the majority of the parents and the educators indicated. In Table 5.71 the majority of the parents and the educators indicated that children with ASD occasionally respond when their parents, educators, and others use gestures or facial

expression to communicate with them. This was also recorded during the classroom observation, and some interviewees also mentioned that children with ASD may have feelings sometimes for people they know and they may show emotional expressions to them.

From the above findings above, it is deductible that the majority of these children with ASD find it difficult to communicate with people using their emotional cues, and the results suggest further that many children with ASD occasionally respond to such mode of communication from others who may adopt gestures, facial and emotional expressions such as frowning, eyebrows, smiling and others to communicate with children with ASD. These findings align with some studies that have reported that many children with ASD have difficulty communicating their emotions and in recognizing others' emotion (Salvatore, 2018) and mental state through facial expressions in others (Baron-Cohen, Golan & Ashwin, 2009). All these findings imply that social communication and competence in L1, or L2, or L3 may not be possible without intensifying efforts towards that direction as earlier as 18 months of age.

7.4 Is there any Disposition of Parents, Educators, and Clinicians towards the Development and Deployment of Bi/multilingualism by Autistic Children?

This research question aims at providing information to objective 3 of this study which focuses on issues that surround autistic children's language acquisition, language production, and language comprehension and the use of one or multiple language(s) for various social interactions and communications at home and school especially. The dispositions of the caregivers are reported based on responses obtained from the survey and the interviews are explained under the subheadings that follow.

7.4.1 Number of Language(s) Children with ASD are Exposed to, and Number of Language(s) Used for Communication

Table 5.14 shows that at home, the majority of parents (30 (85.7%)) raised and exposed their children with ASD to one language despite that the parents were proficient in two or three languages as shown in Table 5.6. In Table 5.15, the majority of the parents showed that their choice of one language was based on advice received from professionals such as educators, clinicians, and speech and language therapists. Some parents mentioned that they employ one language to communicate and raise their children with ASD based on their personal belief.

Some parents were advised by some other people to choose a specific number of languages for interactions, communications and other activities. Similarly, in Table 5.44, none of the educators was monolingual, while the majority were bilingual, and the rest were multilingual with varied proficiency in their L1, L2, and or L3. The majority of educators confirmed that they employ one language for teaching children with ASD while fewer educators attested to using two languages. In Table 5.60 however, the majority of the educators disagreed that there is a possibility of children with ASD who are verbal to learn and use English, isiZulu, and other languages in various contexts of communication. This result confirms the earlier opinions that many participants disagreed with the use of two or three languages for communicating with children with ASD or for raising them. Table 5.61 also shows that almost all the educators believed that early interventions and adequate support from qualified educators, clinicians, family members, and speech therapists can enhance linguistic and communicative competence of children with ASD. While Table 5.37 indicates that the majority of parents disagreed that professionals understand how services work together and that they offer adequate guidance to parents; Table 5.38 indicates that more than half of the parents agreed that there would be an improvement in language and communication of children with ASD if all service providers work well on their children. These results are similar to those obtained from the interview responses of selected educators and speech and language therapists.

Also, during classroom observations, the majority of the educators were communicating with children with ASD in isiZulu and in sign language. In interviews, the majority of educators, speech and language therapists, and clinicians revealed that raising children in one language is the best as exposing them to two or more languages can increase the level of difficulty in producing speech and in mastering social communication. Only few speech and language therapists believed that children with ASD can be raised or be exposed to two or three languages. They indicated that must be well-planned in such a way that Augmentative and Assistive Communication (AAC) devices and strategies can be deployed to enhance these children's linguistic and communicative skills; however, that may be difficult to achieve in the research areas due to low awareness and lack of resources.

While the findings about learning two or more languages, or exposing two or more languages to children with ASD seemed diverse among the professionals; the majority of the parents unequivocally believed that one language is the best for their children with autism in order to

avoid any harmful effect of bilingualism or multilingualism as shown in their responses (see section 5.3.4). The above was also corroborated by one of the findings obtained from class observations whereby educators employed one language to teach children with ASD, though that was used along sign language as many of those children with ASD in this study were non-verbal. This finding deviates from the fact that families that are bilingual can develop bilingual ability in their children with autism for the purpose of enhancing social interaction at home and away from home, as well as facilitating communication with the same family and showcasing their ethnic identity wherever they are (Kremer-Sadlik, 2005; Wharton et al, 2000; Yu, 2009).

Furthermore, while the sampled parents, educators and some clinicians/paediatricians, and speech and language therapists also accepted the prevalent belief that bilingualism/ multilingualism may worsen the burden of ASD in the affected children, Petersen et al. (2012) have shown that such an idea has led to detrimental results among youth with ASD who were raised by bilingual families. This study therefore concurs that when caregivers (parents, educators and clinician/paediatricians who are bilingual or multilingual in this context) resolve to raise children with ASD in one language, they may deny such children the benefits that come with bilingualism such as stronger or better cognitive and linguistic capabilities in some aspects like forming of concept as well as in metalinguistic awareness (see Bialystock, 2001; Petersen, Marinova-Todd & Mirenda, 2012; Wei, 2000). The commonly held belief that bilingualism is too confusing and even unreasonable to expect of children with ASD has led to potentially detrimental outcomes for autistic youth from bilingual families (Petersen et al., 2012; Yu, 2009).

7.5. Are there Neurocognitive and Psycholinguistic Bases for Understanding Autism, and for Enhancing Linguistic and Communicative Competence among Autistic Children in KwaZulu-Natal Province?

This research question's goal was to investigate the neurocognitive and psycholinguistic bases of ASD in relation to enhancement of linguistic and communicative competence of children with ASD. This question was set to give insight to objective 4 of this study. The responses were mainly obtained from the survey administered to educators as well as from the interviews from educators and speech therapists. In Table 5.46, the majority of educators agreed that many children with ASD have low intelligent quotient (IQ) while some of them disagreed. Regarding expressing mental state, almost the same number of educators agreed

and disagreed that children with ASD can express mental state. Furthermore, regarding Theory of Mind (ToM), the majority of educators disagreed that children with ASD lack ToM while some of the educators indicated that these children lack ToM. In Table 5.49, only few educators agreed that lack of ToM may aggravate issues on linguistic and communicative competence faced by children with ASD. The majority of them disagreed with that claim. From the interviews, it was found that the majority of educators and the speech and language therapists had little or no understating about the possibility of lack of ToM to affect the linguistic and communicative competence of children with ASD.

It is therefore deducible that many educators and speech and language therapists, despite being among the main caregivers of children with ASD, lack knowledge of ToM in relation to ASD and its core features, as the majority of the educators altogether indicated that they had no knowledge of Theory of Mind (ToM) and how it can influence the linguistic and communicative competence of children with ASD they were teaching. Similarly, some speech and language therapists indicated they had no idea or awareness about the theory. Coupled with the responses obtained from the qualitative data whereby the majority of the educators confirmed their lack of awareness about ToM and its effect on language and communication of children with ASD, this study therefore found that the majority of the participants had no idea that ToM is helpful to understand tests such as false belief that has been used to evaluate children's mental state and how people with ASD respond to a false world created for them, and also to understand when these children reached their chronological age or verbal mental age (VMA) (Happé, 1995; Helen Tager-Flusberg 2007). The lack of knowledge or awareness of many participants in this study also implies that they may not understand that lack of ToM has a huge impact on communicative difficulties of children with ASD (Baron-Cohen et al., 1985; Naushin, 2013), irrespective of whether these children are exposed to one language, two languages or more languages. Succinctly, the divergence in this result may be due to the extent of personal knowledge on ASD, dearth of research on ASD, and lack of awareness on ASD in Africa in general.

Additionally, it is deducible that the participants were not aware that ToM can help in viewing the social-communication impairments of children with ASD as a complex phenomenon which also involves processing of mental state information as well as inferring information from a particular situation; and both children and adults with ASD have been identified as having or using different neurocognitive systems (Tager-Flusberg, 2007). Apart

from social-communication, some studies have suggested that delays or abnormal cognitive understanding noticed in the human mind also extends to difficulties in some behaviours like interpersonal relationship such as exchanging conversation with others (de Rosnay et al., 2014; Peterson et al., 2009; Frith et al., 1994 cited in Peterson, 2014), engaging in peer interaction (Dissanayake and Macintosh, 2003 cited in Peterson, 2014), and showing sympathy or responding with empathy (Charman et al., 1997; Yirmiya et al., 1992 cited in Peterson, 2014).

In this context, it is important to note that the development of theory-of-mind skills has connection with the language ability (see Astington & Baird, 2005); therefore, educators of children with ASD definitely need knowledge about the nature of behaviours, conversations, and interpersonal interactions (of verbal and non-verbal children with ASD) which all have an influence on their linguistic and communicative ability. This notion correlates with some findings that knowledge of semantics, grammar, and specifically embedded sentence structures (which are complex in nature) are partly needed to pass certain false-belief activities (Tager-Flusberg & Joseph, 2005). For children with ASD, mastering the meaning (semantics) and syntax of verbs used in communication is essential for developing ToM skills and also for understanding linguistic constructs that may be differentiated from the analogy made from content of mental states and one made from content of speech, and this in turn may help to know that the content of both mental states and speech may not really indicate the reality and this may be also help children with ASD to discern reality from the world represented by people around them (see Tager-Flusberg, 2007).

Furthermore, in this study, the discovery that many caregivers had little or no knowledge of ToM and its relevance for enhancing linguistic and communicative ability of children with ASD has potential of limiting language and communication intervention from school, which is another place apart from their home where these children do spend several hours and acquire knowledge. Using the understanding of ToM can also increase the possibility of how educators can build explicit theory of mind (this has been explained under the theoretical framework in chapter 3) which is essential for building social insight through implicit measures which have been confirmed missing among children with ASD (see Ruffman et al. 2001; Tager-Flusberg, 2007). Another instance that shows that ToM knowledge is needed by educators and other learned caregivers can be found in a report about the intersection of ToM processing and complex reading comprehension whereby there was an excessive activation in

the right hemisphere of high functioning individuals with ASD, which in turn led to spillover processing unlike typically developing control group. That fact also helps to explain that inferences usually made by children with ASD may not be contextually appropriate due to similar activation of all their inferences, lower functional connectivity found within the network of ToM as well as lower functional connectivity between ToM and language network in the left hemisphere (Masona et al., 2008).

7.5.1 The Relatedness of Language and Communication Impairments and Brain Functionality

In response to another part of the research question 4, the views of the educators (in the survey and interviews), the speech and language therapists, and clinicians/paediatricians (in the interviews only) concerning the relatedness of brain functionality and language and communication impairments were sought. Almost half the number of educators agreed and the same number disagreed. In Table 5.51, the educators' responses to the view that disruption of brain parts adds to linguistic and communicative competence issues were sought. Relatedly, the majority of the participants declared that they had little or no knowledge about disruption in brain connectivity, and some language and speech therapists, and the clinicians/paediatricians alluded to brain injury while answering the questions posed to them.

Moreover, Table 5.52 reveals perceptions of educators about the possibility of neurolinguistic study or neurolinguistic assessment revealing the nature of both receptive and expressive language of children with ASD. The majority of the educators disagreed; while some of the educators agreed to this view. This implies that the majority of the educators have little or no idea about neurolinguistics and its inherent language and brain connection. Moreover, Table 5.53 reveals that more than half the number of educators agreed that verbal intelligent quotient (VIQ) of children with ASD can be evaluated through expressive and receptive languages. The majority of the speech and language therapist revealed the possibility of disruption in brain connectivity and its influence on language and communication of children with ASD.

Meanwhile, it can be deduced that the majority of the participants had little or no knowledge about the nature of disruption in brain connectivity which is significant in understanding neurocognition and neurolinguistics and their interconnection with language and

communication of children with ASD. Alternately, a few participants saw the possibility of such interconnection. Overall, both the questionnaire (section 5.5.2) and the interviews revealed that the majority of the participants in this study held views that were not closed to some previous reported results. For instance, Peeva et al. (2013) mentioned specifically that ASD has been characterized as a brain connectivity disorder with white matter often being affected among people with ASD. With the help of diffusion tensor imaging (DTI) scans, their study of some high-functioning people with ASD showed a weaker connection between their left ventral premotor cortex (vPMC) and the other part of their motor area, meaning that network of speech production is impaired among the affected person even with the presence of normal language abilities.

Similarly, in chapter three of this study (section 3.5), one of the theories mentioned is the Disrupted Connectivity Hypothesis of Autism Spectrum Disorders which offers a possible clinical explanation of ASD based on abnormalities in terms of how different brain regions coordinate and synchronize their activities (Vasa, Mostofsky & Ewen, 2016). These authors also reported that though some inconsistencies in the data and findings were reported concerning disrupted cerebral connectivity; the most consisted data and reports have shown that some abnormalities in behavioural, social, and cognitive phenotype noticeable among the affected individuals can be linked to weak connections noticeable between distant regions of the brain and also some increased connections found in local regions of the brain (Belmonte, et al., 2004 cited in Vasa, Mostofsky & Ewen, 2016).

Furthermore, another set of studies have confirmed long-range underconnectivity in autism with mixed structures of long range of both overconnectivity and underconnectivity or simply, long range overconnectivity (Mizuno et al., 2006; Noonan, Haist & Muller, 2009; Turner et al., 2006; Shih et al., 2010). In this study, the parents indicated no understanding of neurocognitive–cum-neurolinguistics-bases of ASD, as they only believed that overtime, the condition of their children will change. Notably, their expectations may not be realizable as many caregivers especially the educators, speech and language therapists, and clinicians/pediatricians in this context displayed little or no understanding of the impairment in speech network, the Disrupted Connectivity Hypothesis of Autism Spectrum Disorders, and disruption in the ToM network especially language network in the left hemisphere.

The implication of the lack of understanding that aspects of ASD include lack of seeking

combined interventions that can help both social communication and in language and communication (APA, 2013; Lord & Risi, 2000; Rogers & DiLalla, 1990) and other possible therapies that may normalize the disrupted pathways and thereby improve speech of individuals with ASD (Peeva et al., 2013). Lack of ToM among children with ASD is also evidenced in this study as the majority of the parents and the educators have revealed in chapter five. This lack of ToM can therefore be associated with some deficits or irregularities found in the verbal and nonverbal communications of children with ASD observed in this study in section 5.7.1 (that focused on maintaining eye-contact while talking), section 5.7.2 (that focused on turning head at something next to them), section 5.7.3 (that focused on turning eyes to avoid looking at someone closed by), section 5.7.4 (that focused at direction while showing at a toy or a picture in a book), section 5.7.5 (that focused on the possibility of grabbing and using someone's hand and placing it on something needed), section 5.7.6 (that focused on the possibility of using gestures to draw attention), section 5.7.8 (that mentioned showing emotional expression like smiling, frowning, and raising of eyebrows in surprise).

7.5.2 Language Production, Acquisition, and Development can be Delayed, be in Deficit, or be Absent in Autistic Children

Regarding psycholinguistic bases of ASD as mentioned in 7.5, the majority of educators agreed that delay, deficit, and absence of language production, acquisition, and development are common among children with ASD although a few disagreed. In Table 5.55, it was revealed that half of the educators agreed and the same number disagreed that echolalia and language regression are common among children with ASD. However, these features may not be significant any longer as a basis of ASD diagnosis using DSM-V (APA 2013). Furthermore, Table 5.56 showed that the majority of educators disagreed with the claim that there is deficiency in mental processes involved to comprehend, produce and acquire language(s) as well as its influence on linguistic and communicative competence of children with ASD even though some of them agreed. In the interviews, the majority of the participants revealed that they have little or no knowledge about cognitive and neurolinguistic bases of language patterns of children with ASD. In Table 5.57, the majority of the educators agreed that semantics, grammar, and pragmatics aspects of language may develop lately or deficiently among children with autism. Similarly, in Table 5.58, the majority of the educators agreed that there is absence or deficiency of discourse or conversational principles among children with ASD.

The result on aspects of language above corroborates the one obtained during classroom observations and from related interview responses with some educators and speech and language therapists. This result is also closely related to a report by Wittke et al. (2017) that children with ASD include those whose language is normal; those with problem in producing grammar but have little vocabulary, and those whose language ability is low. As the majority of children with ASD in this study can be categorized as those with low language abilities, as there was absence of pragmatic skills and discourse and conversational principles among them. Only very few of them displayed little skills in these aspects of language and communication. Relatedly, Weismer et al. (2011) reported that there is similarity between the semantic categories of words (with terms on psychological state terms) among toddlers with ASD and those of late talkers. The authors also revealed that the lexical-grammatical abilities of toddlers with ASD relatively have lower association even though both groups displayed equal proportion of grammatical complexity of words combination of their age. Similarly, Nasim (2013) captured the difficulty these children face in understanding literal meaning.

7.5.3 Types of Common Grammatical Errors that are Prevalent among Children with Autism

In addition to what was reported in 7.5.2, language production, acquisition, and development of children with ASD are also characterized with grammatical problems or errors. The majority of the educators and language and speech therapists in the interviews reported that the common grammatical errors (in isiZulu or English or both) among these children include incorrect tense, inability to identify when tense has been changed in conversations, failure in most times to use correct verbs and their corresponding subjects, wrong use of preposition and first-person pronoun. These findings are closely related to what Naushin (2013) reported, though the author did not clearly mention whether the results were obtained from children with ASD who were verbal or non-verbal. As the researcher noticed in the classroom observations, lack of ToM among many children with ASD can be linked to grammatical difficulties such as understanding reflexive pronouns in a conversation and in identifying and using correct verbs and tense. These findings corroborate Durrleman's (2017) report on three studies that focused on ToM and mastery of first-person accusative pronoun; ToM and executive functions, and complementation; and ToM and complementation when the ToM tasks are non-verbal. The author reported further that those studies have shown that there is interconnection between grammatical skills, which also include knowing and using complements and pronouns correctly in sentences and the ToM abilities among individuals

with ASD.

Another study that aligns with what was reported above on tenses of children with ASD (who in this study were with impaired language) was conducted by Modyanova, Perovic and Wexler (2017) focused on the tense marking abilities and morphosyntax of two subgroups: those with autism with impaired language (ALI) and those with autism with normal language (ALN), and then compared them with the controls; that is, the typically developing (TD) children who were in two groups: non-verbal mental age (MA) and verbal mental age (VMA). The authors confirmed that the participants were made to perform some tasks such as probing third-person-singular -s as well as past tense -ed, based on the Rice/Wexler Test of Early Grammatical Impairment-TEGI (Rice & Wexler, 2001). The study thereby reported extensive deficits in the ALI group, which means that this group had extremely poor tense marking when compared to the performance of much younger TD controls, and also greatly worse when compared to those in the ALN group (Modyanova, Perovic & Wexler, 2017). This study observed errors in case marking and subject-verb agreement, whereas Modyanova, Perovic, and Wexler (2017) reported no such error. The difference may be due to problems with lexical and grammatical transfer that is noticeable among learners whose L1 is not English. While this study also reported the use of personal pronoun especially 'I' and 'You', Modyanova, Perovic and Wexler (2017) added that the majority of their sampled children with ASD whose language is impaired usually used the pronouns 'you' in objective case.

7.6 What are the Implications of Neurolinguistic and Psycholinguistic Bases of ASD on the Linguistic and Communicative Competence of bi/multilingual Autistic Children and their Academic Performances?

This question was formulated to give explications to research objective 5 of this study which focuses on some learning tasks in relation to linguistic and communicative acts in school settings and their implications on the academic performances of the affected children. In the interviews with the selected educators and speech and language therapists, it was revealed that ASD has a profound negative impact on the academic performance of children with ASD. Many educators mentioned that many children with ASD were brought to school very late (up to 15 years) and these children did not receive a replica of educational intervention including training on behavioural and social communication at home. Also, one educator mentioned that children with ASD wanted to have their own world even during teaching; their interest in academic activities is mostly unstable, and thereby poorly affecting their

overall academic performance. The majority of the parents indicated that only schools have worked well for them and their children with ASD while healthcare centres were mentioned as second (see Table 5.39). The speech and language therapists however believed that the burden of autism, especially on those children who had received ineffective intervention, late intervention, and getting admission to school at older age, may definitely affect the intelligent quotient, verbal mental age, and interest in academic tasks. They also affirmed that those aforementioned issues will definitely work well for attaining linguistic and communication competence, cognitive-behavioural enhancement and better academic performance if addressed as early as possible.

7.6.1 Problems with Articulation, Writing, and Reading Affect Academic Performance of Children with Autism

The educators and speech and language therapists identified that as far as those children with ASD have difficulties in speaking, writing, and reading below average in most cases, then it will be hard to perform well in their academics and in communication in general. These participants also mentioned that lack of different reading and writing skills noticeable among typically developing children are missing among children with ASD, this challenge may be aggravated by difficulties in coordinating or organizing themselves as well as motor problems. They also affirmed that it is not easy to say they understand what has been read if at all they read, while their letters are wobble and /or sloppy. The above results confirm what were found regarding the academic performance of children with ASD during class observations. As found in the classroom observation and attested to by the educators, many of these children have extreme difficulties in learning clicks which, according to Westerman and Ward (1990), account for one-seventh of all Zulu words These difficulties are regardless of their position like dental represented by letter /c/, /ch/, /gc/, /nc/, /ngc/; palatal-alveolar position represented by /q/, /qh/, /gq/, /nq/, and /ngq/; and alveo-lateral position represented by /x/, /xh/, /gx/, /nx/, and /ngx/.

Notably, most children with ASD struggled to pace in their learning despite that the concepts they were being taught were simple and below their biological age. The educators considered their mental age and simplified their lessons, but it seemed many of these children failed to cope on time.

Essentially, this study has shown that many children with ASD who are even verbal have difficulties in articulating certain sounds, syllables, words, and phrases. The class

observations conducted also corroborate this finding, as their educators had to devise means like the use of both sign languages and verbal language in order to make some of the children with ASD respond to class activities. It was also noticed during the class observations that each child with ASD had varied degree of competence and difficulties in their articulation, reading and writing. Altogether, it was found that there was absence or underdeveloped reading and writing skills, delayed phonetic and phonological processes, inability to organise the sounds correctly even among those who can articulate, problems with motor which affected their writing and which led to wobbling handwriting, needing assistance to grab writing implements, loss of semantics of what has been read to them or what children with ASD read themselves.

The above findings have some resemblances with what some studies such as Naushin (2013) and Wolk, and Brennan (2013 have reported. Wolk, and Brennan (2013) for instance investigated articulation/ phonological errors among children with ASD, and reported a closed interconnection between severe phonological impairment and severe language impairment as children with severe ASD showed more difficulties in processing speech sounds and uncommon trends in their phonology. The authors also reported atypical phonological processes that are more than necessary, and occurrence of these processes in high frequency than those found among children with mild autism. While the majority of the children with ASD in this study were said to be severely impaired according to report by some of their educators, it is logical to relate such claim with the findings above. As Wolk and Brennan (2013) noted, there exist insufficient empirical evidence regarding atypical phonological processes and their extent (i.e., may be the processes are significantly minimal or higher) among children without ASD but with certain speech sound disorder. Gordon (2007) also opined that individuals with ASD have difficulty in paying attention to sounds, in decoding the sounds they have heard, and in matching the speech sounds to a particular thoughts or words. The author also stressed that frequently, most individuals with ASD find it hard to articulate, and such problem may be linked to oral-motor function, which involves lips and tongue movement and breath control that associate with it. It can be said therefore that problem with oral-motor function mentioned by Gordon (2007) aligns with what was mentioned by EDU7 in section 6.8, and may be responsible for difficulties in articulating velar, clicks, bilabial and some other sounds.

Additionally, articulation is an integral part of communication, and enhancing manipulation

of speech sounds and phonology in a communication require concerted efforts and varied strategies which also need expertise and combined efforts of caregivers especially speech language pathologists, behavioural analysts, educators, and other interventionists to carry out. Lindblad (2012) highlighted and reviewed some interventions (even though some lack substantial evidence of being effective). Among those mentioned is articulation therapy which involves targeting a particular sound which must be practised alone and before being extended to syllables, words, sentences, comprehension or stories but no much evidence in form of descriptive report, case studies have shown its effectiveness. Another intervention is echoic training that draws from applied behaviour therapy (ABA) but similar to articulation therapy. It helps in shaping specific sounds and words to their normal articulation, and Ross and Greer (2003) believed it has produced substantial and effective speech among some children and not on others.

Similarly, Lindbald (2012) mentioned Mand (request) Training as another verified intervention for articulation problems among children with ASD. Specifically, this method employs echoic training or speech shaping targeting the context of a particular request for the purpose of emphasising how to motivate a child to communicate. It means that a child is rewarded with an item for saying a sound, words, or phrases that relate to the item. This approach has been found to be good; however, Sherer and Schreibman (2005) asserted that children with ASD may respond to this approach in different ways.

Regarding the reading pattern or extent among children with ASD, the findings of this study align with some studies' findings. According to Gabig (2010), in reading single words, children with ASD have reasonable ability but it is below what can be said as average phonemic awareness. In relation to understanding and ascribing semantics to what has been read, Davidson and Weismer (2014) reported that these children have decoding skills in higher form but their reading comprehension is lower. According to Cápay and Cápayová (2019), Ramdoss et al. (2012), Allen, Hartley and Cain (2015), and Lorah et al. (2015), teaching reading to children with ASD can only be effectively done with the aid of technologies. Regarding writing, the findings in this study are in line with Time4Learning (n.d) mentioned challenges such as difficulties in coordinating or organizing themselves, motor problems, sloppy handwriting, inability to translate the intended spoken language into writing, difficulty in writing for a particular set of people (i.e., an audience), and having an extreme focus on writing without much attention about having a larger goal picture. Part of

the solution proffered to enhance writing of children with ASD include the use of new modern technologies like tablets, computers, iPads, portable media players, interactive board as well as computer software including games (Ramdoss, et al., 2012; Allen, Hartley & Cain, 2015; Lorah et al., 2015; Cápay & Cápayová, 2019). Gordon (2007) also opined that individuals with ASD mostly pay attention to visual materials, and such materials can serve as one of the means of gaining access to their minds as well as offering them a route of expressing themselves.

7.6.2 Challenges Children with Autism Have in Word Use and Sentence Structure

As part of what affects academic performance of children with ASD is their word and sentence structure. As in the production and comprehension of expressive and receptive languages in either L1, L2 or L3, word use and sentence structure also have neurolinguistic and psycholinguistic underlying as mentioned previously. According to the educators and the speech and language therapists, those who were verbal among these children with ASD commonly produce one-word utterances (mostly verbs and nouns) sometimes to request or respond like children in their holophrastic stage. Similarly, all of the participants revealed that many times, the words were out of context and that most words were used in combination with sounds that may imply (dis)approval, excitement, and anger.

This result has some similarity with what Nasim (2013) found that the majority of children with ASD do not understand non-literal meaning of phrases and words. Beakadi (2006) also reported that as part of manifestation of pragmatic language disorders (PLDs), children with ASD lack understanding of non-literal sequences. It was found that most of these children with autism found it difficult to progress from holophrastic word production to multiple-word production. This finding corroborates what was obtained in section 5.7.7 where the majority of parents and the educators agreed that children with ASD never used words or gestures to point at something needed; while some mentioned that the children sometimes used words and gestures. In addition, it was evident from the submission of the speech and language therapists and from classroom observations that many children with ASD who are verbal may lose words already acquired or learned, and thereby degenerate to non-verbal. This result is closed to Naushin's (2013) observation that language loss and loss of social skills are common among children with autism. However, Al Backer (2015) believed that the

mechanism underlying regression is not known, and that the prognosis of developmental regression among autistic children cannot be easily predicted. While this study's finding aligns with the submission made by Tager-Flusberg et al. (2005) that at 12 months to 18 months, no fewer than 25% of the children with ASD have some words, but gradually lose those words; the mechanisms responsible for that may not be accurately confirmed.

7.6.3 Methods or Strategies Used as an Educator or as a Speech and Language Therapist to Teach and Improve the Language and Communication Deficits of Children with ASD

Concerning the strategies and methods the educators and the speech and language therapists used for teaching and for enhancing language and communication of children with ASD, the majority of the participants mentioned the use of sign language (including demonstration of tasks), pictures, songs and visuals like flash cards, photographs, and educative TV contents. Emphasis was also laid on the use of routine in the classroom and educators' understanding of what each child actively and positively responds to as no two children with ASD are absolutely the same. While only one speech and language therapist confirmed the use of audio-visuals like iPad and laptop for teaching and improving the language and communication deficits of these children; only one educator mentioned adoption of a strategy such as capitalizing on the strength of each child with ASD in the classroom.

The findings from these participants confirm the findings from the classroom observations where educators were found using sign language, demonstrations of certain tasks, pictures, naming cards, and songs. It was also found during classroom observations that the classrooms were arranged well to ensure enough space, and all materials were carefully placed. Many educators used simple words to explain tasks and lessons to the children, and some routines were also followed and repeated for days. It was found from the classroom observations that much of teaching materials were not modern and some educators also confirmed that many families may even find it difficult to acquire and replicate the use of teaching materials like flash cards, colourful dice and counters used at schools, and this may be due to financial constraints.

In this context, many of this study's findings align with what scholars have reported except that only one educator mentioned capitalizing on the strength of each child as part of the adopted teaching strategies and for enhancing language and communication of children with

ASD. It can be implied that the majority of the educators as well as the speech and language therapists did not fully dedicate time towards using all the components of Structured Teaching Strategies to improve language and communication of children with ASD. Structure Teaching Strategies, according to Hume (2018), was developed by Division TEACCH (Training and Education of Autistic and related Communication-handicapped Children) in North Carolina state. The educators have not maximized and integrated approaches such as ABA (see Eric, 2020), TEACCH (see Mesibov, Shea & Schopler, 2014; Corsello, 2005; Panerai, Ferrante & Zingale, 2002; Mesibov, 1997; Hume, 2018 among others), AAT (see Gentry et al., 2010; Gentry, 2008; Gentry & Wallace, 2008) towards teaching and learning several linguistic and communicative skills. Another finding from class observations also confirmed another finding from the qualitative data that parents' collaboration and educators' understanding of ASD are other sets of what may work well with academics, language and communication improvement of children with ASD. These results are similar to parents' indication in the qualitative results in section 5.6.2 that combined efforts of the caregivers including educators, speech and language therapists, and clinicians/paediatricians may improve the linguistic and communicative competence of their children with ASD.

According to Hume (2018), TEACCH as a set of teaching techniques has major components like routines that are meaningful and predictable, addition of visual or structure to support and enhance classroom instruction and other tasks which in turn help these children to become independent and be meaningfully engaged. Hume also mentioned that Structured Teaching strategies help in increasing normal behaviour and reducing fear as classroom spaces and the teaching materials are organized clearly. Many scholars (Mesibov, Shea & Schopler, 2014; Corsello, 2005; Panerai, Ferrante & Zingale, 2002; Mesibov, 1997 among others) have advocated the use of TEACCH as a set of teaching strategies designed for enhancing communication and education of children with ASD.

Importantly, Augmentative and Assistive Technology (AAT) or simply Assistive Technology (AT) falls in line with visualization of everything. Tony Gentry, a professor of Department of Occupational Therapy and Director, Assistive Technology for Cognition Laboratory at Virginia Commonwealth University, did extensive research on the use of Personal Digital Assistants (PDAs) for individuals with ASD. PDAs are like mobile devices (with some having touchscreen, internet connection (intranets or extranets), electronic visual display, ability to make phone calls, organize tasks, schedule tasks, and thereby functioning like one's

information manager.

Today, PDAs have been widely replaced with high-tech smartphones, especially those running on Android and iOS (Smith & Wempen, 2011). Specifically, Gentry advocated that PDAs, iPads and smartphones should be leveraged on if anyone is having typical cognitive-behavioral problem(s) like communication issues, inability to multitask, remember names, location, and doing things (Gentry et al., 2010; Gentry, 2008; Gentry & Wallace, 2008). Desideri et al. (2020) also found in their systematic review that assistive technology may effectively compensate for executive function related challenges among children with ASD as it is believed to aid cognitive processes such as insight, organisation and planning, flexibility of cognition, as well as time management, though only insight has been empirically confirmed. Similarly, the systematic review conducted by Marcotte et al. (2020) on how to make people with ASD be independent at home suggested that AAT is highly needed as out of 7 interventions found, 3 AAT-related interventions such as video prompting, video self-modelling, and video modeling were also advocated.

Furthermore, Kim Greene (n.d.) from Scholastic Teachers mentioned some ways to support children with ASD through teaching, and these ways include telling them social stories, using visuals, keeping the lesson or tasks simple, and integrating sensory tasks or activities. Some of these strategies align with this study's findings. Additionally, Applied Behaviour Analysis (ABA) and discreet trial teaching (DTT), also known as Lovaas Model, have been mentioned as a way to change certain behaviour and skills by simply breaking them down into smaller parts or steps and then teaching these smaller parts until learners are able to master and perform them. Eric (2020) reported that the use of Lovaas Model and other newly made developmental behavioural interventions after clinical trials have proved to be positively beneficial to domains such as language, social behaviour, cognitive, and play even though no replication of such results has been consistently made. The majority of the participants did not specifically mention ABA, their description coupled with findings from classroom observations of how lessons, behavioural tasks, and communication were structured (broken down into simple tasks, scheduled to be repeated for days among others) corroborate the ideas behind the use. ABA serves as a part of the strategies or interventions for teaching and for improving language and communication of children with ASD.

It can be deduced that children with ASD may benefit from the use of AAC just as from their

educators and caregivers. The educators and other caregivers therefore need to consider the use of AAC (where possible) as part of diverse strategies for enhancing behavioural, linguistic and communicative (Kientz et al., 2014; Kumm, Viljoen, & de Vries, 2021). Nonetheless, issue like digital divide existing in low-and middle-income countries (LMIC) has limited access to useful technology that autistic individuals may benefit from. According to Kumm, Viljoen, and de Vries (2021), about 95% of autistic individuals are in those countries, and many people are there experiencing erratic power supply, poor or no internet, and limited ability or chance to acquire a range of digital devices. Notably, understanding what works well for each child (i.e., knowing and devising a method or an approach which can effectively aid teaching each child as well as their linguistic and communicative competence whether in their L1 or L2), and making almost everything visual to children with ASD are essential knowledge educators and speech and language therapists of these children should possess if possible. This implies that teachers of children with ASD may employ different approaches, and blend modern devices with traditional teaching aids, especially to allow continuity of effective strategies at home.

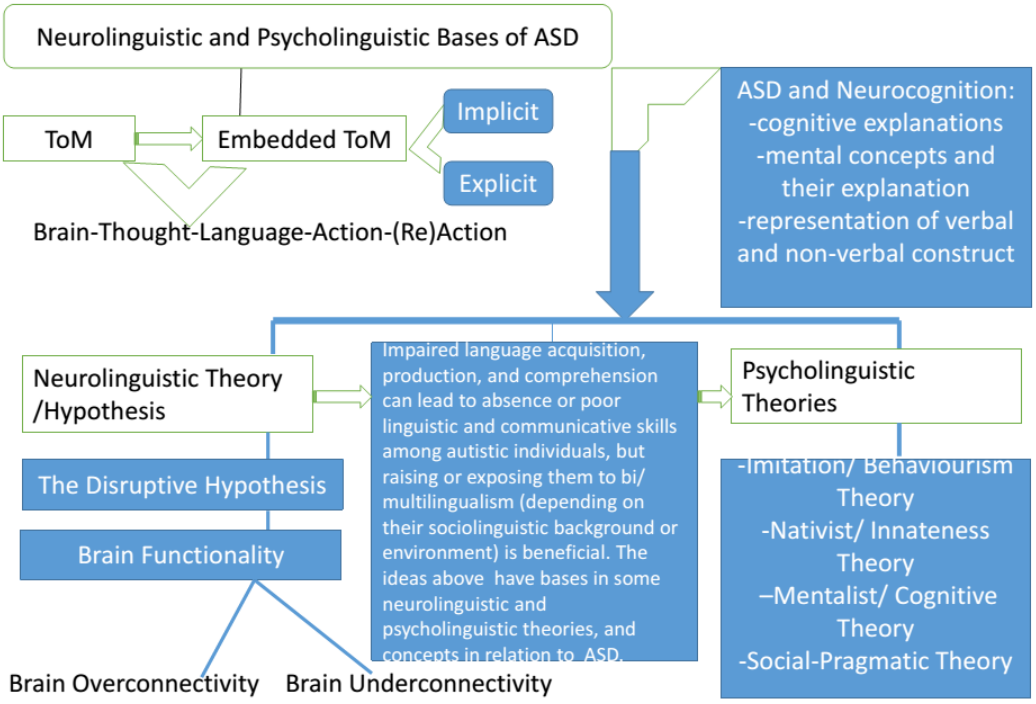

Figure 7.1 A model showing some bases and theories that can aid caregivers' understanding of ASD among children especially from neurolinguistics and psycholinguistic perspectives (Source: Researcher,2021)

In Figure 7.1, it is shown that there are some underlying phenomena that traverse

neurolinguistics and psycholinguistics and sociolinguistics fields of study but whose basics are essentially linked to the core features of ASD in relation to a particular sociolinguistic context which in this case is bi/multilingual society. The model is not all-encompassing, but it has a potential to give more insight into the nature of ASD especially social communication. The understanding of bases of ASD by the participants of this study (i.e., the parents, educators, speech and language therapists, clinicians/ pediatricians) can in turn lead to increased delivery of quality caregiving services to children with ASD raised as monolingual, or as bi/multilingual.

7.8 Summary

The chapter has detailed the main findings of this study. The majority of the findings were obtained from the combination of survey, interviews and classroom observations. The chapter presented the results in response to research questions and in line with research objectives, and foregrounded the results based on some theoretical and empirical literature. Based on triangulation of qualitative and quantitative data, the chapter gave deeper insights into various issues that the research questions were focused on. The next chapter presents highlights of the result summary, the conclusions, and the recommendations.

CHAPTER EIGHT

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

8.1 Introduction

Based on the interpretation of the findings, this chapter highlights the summary of the results found and the contributions made by the study. The chapter also makes recommendations as well as suggestions for future research on ASD. This study's main aim was to ascertain the nature of socio-communication traits of children with autism in KwaZulu-Natal and and to suggest ways that may enhance linguistic and communicative skills of autistic children. The main objectives of the study include to:

1. Investigate from caregivers' perspectives in KwaZulu-Natal and possible prevalence among different cultures;

2. Examine method of autism diagnosis and how satisfied are parents with the support or intervention received, and what communicating methods are being employed to interact with autistic children;

3. Examine the disposition of parents, educators and clinicians towards the development and deployment of bi/multilingualism by autistic children;

4. Investigate neuron-cognitive and psycholinguistic bases of bi/multilingual autistic children in KwaZulu-Natal.

5. Examine the implications of such bases on the linguistic and communicative competence of bi/multilingual autistic children and their academic performances;

6. Present understandable neurocognitive and psycholinguistic model to increase caregivers' knowledge of ASD in relation to linguistics and communication of bi/multilingual autistic children in KwaZulu-Natal and beyond.

A sum of 60 participants comprised of parents of children with ASD, educators of children with ASD, speech and language therapists, and clinicians/ paediatricians. These participants were purposely selected from four research sites in KwaZulu-Natal, South Africa. Out of the 60 participants, 16 of them were interviewed in order to follow embedded mixed methods design employed for the study. While the interviews were analysed thematically, the surveys were analysed with the aid of descriptive statistics package. Frequency distribution tables and graphs were used to present the data.

8.2 Participants' Description and Characteristics

Adults with reasonable level of maturity, years of experience at their work and caring for children with ASD participated in this study, and therefore deducible that diverse opinions have been expressed by the participants. To some questions, the respondents agreed to some questions and disagreed to some. Essentially, the opinions expressed by each participant were based on their knowledge and without researcher's influence.

8.3 Summary of Findings in Relation to Research Objectives

This section summarizes the major findings obtained in this study in relation to all research objectives and their corresponding research questions. Below are the representations of each research objectives with their briefly discussed associated findings.

8.3.1 Objective 1: To Investigate from Caregivers' Perspectives in KwaZulu-Natal Province and Possible Prevalence among Different Cultures

The research question below was developed from this objective.

What are caregivers and educators' perspectives about the prevalence of autism in KwaZulu-Natal and among different cultures?

It was found that learning disability is the commonest comorbid of ASD while physical or sensory problem is not common. It was found that ASD is not more common to one culture than to another, but the awareness in one culture may differ from one culture to another; therefore, culture does not literally increase the rate of ASD and no witchcraft, spiritual or supernatural cause could be linked to ASD. From the survey administered to the parents, it was found that the majority of parents affirmed that professionals at General Hospitals, Child and Adolescent Mental Health Services, and special schools (i.e., the educators, the school administrators) understand the impact of ASD on family life of the parents whose children are autistic. One-quarter of the parents agreed that the speech and language therapists understand the effect of ASD on their family life while the majority has no idea whether the physiotherapists, the occupational therapists, and social workers' understanding of ASD impact on family life. It implies that the majority of parents did not use the services of speech and language professionals, social workers, physiotherapists, and occupational therapists, and it can be deduced from these results that the majority of the parents have no connection with them, and it cannot be affirmed that these professionals have understanding of how ASD impacts the family life of parents whose children are autistic.

Additionally, based on the responses from parents, the educators and the classroom observation; special schools and autism centres have optimum understanding of the impact of ASD on family life as some schools and centres devised creative means like *teach-the-parents-to-teach-their-children-in-turn* strategy to ensure that children with ASD were receiving lessons at their respective homes. This strategy means that the school has empowered each class teacher to invite parents to their class on an appointed date and teach them some tasks and topics which they aimed at teaching their autistic children at home.

8.3.2 Objective 2: To Examine Method of Autism Diagnosis and How Satisfied are Parents with the Support or Intervention Received, and What Communicating Methods are being Employed to Interact with Autistic Children

The only research question derived from the objective was:

How autism is being diagnosed, and how satisfied are parents with the support or intervention received, and what communicating methods are being employed to interact with autistic children?

The survey and the interview data contained the responses pertaining to the above objective and research question. The diagnosis according to the majority of the parents was performed by experts such as developmental pediatricians, child neurologists, child psychologists, and child psychiatrists at General Hospitals and at Child and Adolescent Mental Health Services. From the interviews, two of the clinician/pediatricians that participated in this study reiterated that most medical personnel especially the pediatricians, and the neurologists have added offering different support and interventions to people with ASD due to lack of specialized clinics and medical experts. This implies that what was important to the parents is the diagnosis (including confirmation and subsequent manifestation and monitoring) of core traits of ASD such as deficit in social-communication skills and repetitive and restricted behaviours.

Moreover, as shown in the survey, the parents received various interventions in the form of support from professionals or other caregivers and they expressed the level of their satisfaction or dissatisfaction. It was found that almost half of the parents were satisfied with support they received from General Hospitals. A reasonable number of parents however expressed their dissatisfaction with support they received from General Hospital. It was revealed that the majority of parents were not using the services of occupational therapists, speech and language therapists and only few who were using their services were unsatisfied. Also, the majority of parents argued that they did not receive any service from Child and

Adolescent Mental Health Services. Only few parents who used the services expressed satisfaction with the service and support they received. This same result was obtained concerning support from physiotherapists. While no basic opinion was formed concerning support from social workers; the majority of the parents were satisfied with the support they received from special schools. However, a few parents were dissatisfied. Many educators in the interviews also reported parents' failure to complement efforts being made by special schools or by the educators.

The situations above suggest that it will be hard to enhance language and communication (linguistic and communicative competence) of these children with ASD. The inability to enhance linguistic and communicative competence may be aggravated by inadequate knowledge of these parents about the ASD and their lack of finance and or absence of enough professionals like speech and language therapists. In addition, those parents who were dissatisfied with the services or support rendered by the school may be those who with basic knowledge about ASD and high expectations of seeing tremendous improvement in the social communication and behaviour of their children with ASD. The discrepancies in these results may be attributed to different locations of these hospitals, special schools etc., and different professional understanding of various caregivers that those who have attended to these parents had.

Regarding the communication methods, it was found from the survey and interviews that almost the majority of children with ASD in this study were non-verbal, and their parents, educators, and speech and language therapists confirmed the use of words combined with demonstrations, signs, body language, gestures, and pictures as the main methods of communicating with them. In a series of responses, it was found that children with children with ASD occasionally maintained eye contact, sometimes turn their heads when talking or doing things next to them, or when their names are called; sometimes show emotional expression like smiling, frowning, and raising of eyebrows in surprise; often turn their eyes away while having conversation with them; sometimes turn their eyes to a particular direction when their parents, their educators, and others point to for the purpose of showing a toy or a picture in a book; sometimes grab and use the hand of their parents, and their educators like a tool, and place it on something they need as another method of communication; sometimes use gestures to draw attention of their parents, their educators, and others. Conversely, fewer participants mentioned that such non-verbal communication mentioned above occurred often, as well as never. Moreover, the majority of the respondents confirmed that the use of words

combined with gestures to point at something or to communicate has never occurred. Backed up by classroom observations and interviews, it was found that sign language, pictures, and body language are employed by the educators in their classrooms. Making children with ASD imitate what their educators and their few verbal classmates said or pointed at was also found to be influencing how these children produce words and communicate. Another finding is that many children with ASD in this study do show emotional expression occasionally and not often as indicated by the majority of the parents and the educators; and these children respond sometimes to their parents, educators, and others when a gesture or facial expression is used to communicate with them. From the classroom observations, and the interview conducted for the educators, it was realized that the expression of feelings is rare among many children with ASD, and those who sometimes show emotional expression do so to people they knew or are familiar with.

8.3.3 Objective 3: To Examine the Disposition of Parents, Educators and Clinicians towards the Development and Deployment of Bi/multilingualism by Autistic Children

The above objective steered a research question, which was:

Is there any disposition of parents, educators, speech therapists, and clinicians towards the development and deployment of bi/multilingualism by autistic children?

This objective and its equivalent research question are essential for gaining insights into acquisition, production, and comprehension of bilingualism and multilingualism and the possibility of raising or exposing children with ASD to more than a language. As findings from the survey and interviews indicate, the majority of the participants had negative perspectives towards raining communicating, teaching, and exposing children with ASD to bi/multilingualism despite that all the caregivers including some parents claimed to be bi/multilingual. It was found that while many parents were largely influenced by the advice from professionals such as clinicians, speech and language therapists, and educators, the study discovered that the majority of these professionals are against exposing children with ASD to two or more languages. Some parents also followed their personal belief that overall, bi/multilingualism is capable of confusing these children thus becomes precarious to their overall wellbeing. It was also discovered from the participants that exposure multilingualism may be a burden in producing speech, and in mastering social communication. Only few speech and language therapists believed that children with ASD could be raised or be

exposed to two or three languages only if it has been well-planned in such a way that Augmentative and Assistive Communication (AAC) strategies can be deployed to enhance these children's linguistic and communicative skills.

From the survey, the interviews and the classroom observations, it was also found that the majority of educators employed a language to impart knowledge and communicate with these children while only fewer educators employed two languages (to briefly explain some concepts that are hard to explain in their learners' L1). It is deducible from these findings that the majority of the participants lack the understanding that children with ASD can be raised with two or more languages without having adverse effect on them, but instead improve their cognitive ability as many studies have also claimed.

The implication of this is that it may be harder for some of these professionals to enhance linguistic and communicative competence of these children with ASD as chances to improve their cognitive skills using two or more languages has not been explored. While the majority of the educators believed that earlier interventions and adequate support from qualified educators, clinicians, family members, and speech therapists could enhance linguistic and communicative competence of children with ASD; from the survey, the majority of the parents disagreed that professionals understand how services work together and that these people offer adequate guidance to parents. Importantly, it was discovered through the survey administered to parents that there would be an improvement in language and communication of children with ASD if all service providers work well on their children. These results are similar to those obtained from the interview responses of selected educators and speech and language therapists.

8.3.4 Objective 4: To Investigate Neurocognitive and Psycholinguistic Bases of Bi/multilingual Autistic Children in KwaZulu-Natal Province

The above objective steered a research question which was:

Are there neurocognitive and psycholinguistics bases for understanding autism, and for enhancing linguistic and communicative competence among autistic children in KwaZulu-Natal Province?

The responses were mainly obtained from the survey administered to educators as well as from the interviews for the educators and the speech therapists as they were assumed to be knowledgeable about the subject raised. The majority of the educators affirmed that children with ASD have low IQ, but a reasonable number of them also disagreed. The number of the

educators who agreed and disagreed to the fact that children with ASD can and cannot express mental state is almost the same. In addition, more than half the number of educators believed that children with ASD have ToM while many educators indicated that these children lack ToM. It was also found that fewer educators maintained that lack of ToM may aggravate issues on linguistic and communicative competence faced by children with ASD. The interviews showed that only few speech and language therapists have little knowledge about ToM and its effects on thoughts, beliefs, actions, and linguistic and communicative competence of children with ASD.

It is implied that the absence of core understanding of ToM may affect how to relate and contextualize these children's IQ, mental state, false beliefs, verbal and non-verbal communication (or overall behaviour and social communication skills) with the unique features of ASD that are peculiar to each affected child. Essentially, ToM has been used to comprehend false belief test, and in turn has potential to evaluate children's mental state, and how these children with ASD respond to false world and when they reach their verbal mental age possibly pass false belief test. Moreover, lack of ToM knowledge may blur understanding that social-communication impairments of children with ASD is a complex phenomenon which also involves processing of mental state information as well as inferring information from a particular situation; and both children and adults with ASD have been identified as having or using different neurocognitive systems (Tager-Flusberg, 2007).

Relatedly, through the survey and interviews for only educators and the interviews conducted for speech and language therapists, and clinicians/paediatricians only; it was discovered that half of the participants agreed that brain functionality and language and communication impairments are related whilst the other half disagreed to the view. Nevertheless, the majority of the educators also mentioned that there is no relationship between brain functionality language and communication impairments and brain functionality while some language and speech therapists, and the clinicians/pediatricians alluded to brain injury as the possibility of such connection between brain functionality and language and communication impairment. This shows that all the participants (educators, speech and language therapist as well as clinicians/ pediatricians) have little or no knowledge about the connection of biolinguistics, neurolinguistics and psycholinguistics, ASD and acquisition and application of linguistic and communicative skills. Importantly, lack of such knowledge is capable of uncomprehensive interventions that can help in enhancing linguistic and communicative competence of children with ASD (in any language these children were have been exposed to). The above

finding is similar to another finding where the majority of the educators, and fewer speech and language therapists disagreed that neurolinguistics assessment is capable of revealing the nature of both receptive and expressive language of children with ASD, though many educators indicated that the verbal intelligent quotient (VIQ) of children with ASD can be evaluated through expressive and receptive languages. It is deducible that the majority of the educators have no or little idea about neurolinguistics and its inherent language and brain connection. In overall, it can be stated that it can be deduced that the majority of the participants had little or no knowledge about the nature of disruption in brain connectivity which is significant in understanding neurocognition and neurolinguistics as well as psycholinguistics and their interconnection with language and communication of children with ASD.

Another concern raised is psycholinguistic bases of ASD. It was found that the majority of the participants indicated that delay, deficit, and absence of language production, acquisition, and development are common among children with ASD. Moreover, only few educators agreed (the majority disagreed) that there is deficiency in mental processes involved to comprehend, produce and acquire language(s) as well as having influence on linguistic and communicative competence of children with ASD. Relatedly, the interview data revealed that the majority of the interviewees are not knowledgeable about the cognitive and psycholinguistic nature of ASD and with mental processes that production and comprehension of either L1 or L2 and L3 entail among children with ASD.

Furthermore, the survey, interviews and classroom observations have also revealed that semantics, grammar, and pragmatics aspects of language may develop lately or deficiently among children with autism unlike children without autism. Almost all the educators confirmed the absence or deficiency of discourse or conversational principles among children with ASD. Another related finding was the exhibition of grammatical errors such as incorrect verbs and their corresponding subjects; wrong use of preposition and first-person pronoun. This finding was indicated by the majority of their educators and speech and language therapists, and also confirmed during the classroom observations. In this context, these results portend that both verbal and non-verbal children with ASD have difficulty in using grammar, deducing meaning, or making meaningful and reasonable expressions and conversations. It is also deducible that it may be hard to attain linguistic and communicative competence as the majority of their caregivers exhibited little or no knowledge in psycholinguistics and its nexus with ASD.

8.3.5 Objective 5: To Examine the Implications of Neurocognitive and Psycholinguistics Bases on the Linguistic and Communicative Competence of Bi/multilingual Autistic Children and their Academic Performances

The research question formulated from the objective was:

What are the Implications of Cognitive and Neurolinguistic and Psycholinguistic Bases of ASD on the Linguistic and Communicative Competence of Bi/multilingual Autistic Children and their Academic Performances?

The objective and the research question are double-pronged. The first projection was to elicit information from the survey respondents, interviewees and classroom observations about the implications of cognitive, neurolinguistics and psycholinguistic bases of ASD on the language and communication of children with ASD. The second part was to get responses appertaining to the implications of cognitive, neurolinguistics and psycholinguistic bases of ASD on the academic performance of children with ASD. The first main finding reveals that the cognitive, neurolinguistics and psycholinguistic bases of ASD have shown that most of these children are non-verbal and they have problems processing non-verbal cues in most contexts, thus making their linguistic and communicative skills to be extremely low.

Moreover, ASD has huge implications on the academic performance of the affected children, although parents have signified in the survey that only schools have worked well for them and their children with ASD. The majority of the educators in the interviews also indicated that these children always wanted to have their own world even during teaching; thus, their interest in academic activities is mostly unstable, which result in poor academic performance. The collected data also indicated that children with ASD face enormous hardships in articulation (sounds, syllables, words, and phrases), word and sentence structure (for those with these language skills), writing, reading, understanding what others express verbally, alphabetically and or with signs. The above situations, according to educators and speech therapists, may be aggravated by difficulties in coordinating or organizing themselves as well as by other motor problems, and thereby negatively affecting academic performance. It was also noticed during the class observations that each child with ASD had varied degree of competence and difficulties in articulation, reading and writing. Altogether, it was found that there was absence or underdevelopment of reading and writing skills, delayed phonetic and phonological processes, inability to organise sounds correctly even among those who could articulate, problems with motor which affected their writing and which led to wobbling handwriting, needing assistance to grab writing implements, loss of semantics of what has been read to them or what children with ASD read themselves.

On the issue of strategies and methods the educators and the speech and language therapists used for teaching and for enhancing language and communication of children with ASD, it was found that the majority of the participants employed sign language (including demonstration of tasks), pictures, songs and visuals. Fewer speech and language therapists employed modern audio-visuals like iPad and laptop. Likewise, only a few educators consistently capitalized on each child's unique strength during teaching and learning process. From the classroom observations, it was also found that for the purpose of comprehension of class lessons and general communication; the educators simplified words and used traditional methods such as memorization, and play way. Routine and repetition of lessons were part of the teaching strategies some educators employed in the classroom. It can be argued that the majority of the educators as well as the speech and language therapists were not using comprehensive and unique pedagogical approaches such as all components of Structured Teaching strategies developed by TEACCH (Training and Education of Autistic and related Communication-handicapped Children), AAT (which requires visualization of everything), and ABA (Applied Behaviour Analysis).

8.4 Conclusion

In this study, the majority of children with ASD belong to low-language category, and their linguistic and communicative competence is below average of what may be obtained from their age-matched typically developing children. Findings from the study have indicated that ASD existing in South Africa manifests and noticeable in the form of impaired social communication and repetitive or restricted behaviours as extant literature has also shown. Moreover, some trends have emerged based on the nature of ASD among the affected children in this study as well as the knowledge, awareness and experience of people and or professionals (parents, educators, speech and language therapists, clinicians/ pediatricians) who are playing caregiving roles for these children in different ways. The researcher therefore sought to ascertain the nature of socio-communication traits of children with autism in KwaZulu-Natal and to suggest ways that may enhance linguistic and communicative skills of autistic children.

Furthermore, the research aimed at encouraging bi/multilingualism, which is believed to be an asset rather than a deficit to many autistic children. Additionally, the study sought to

provide adequate and latest information tools and skills necessary for enhancing knowledge of language and communication-related services rendered by parents, educators, and clinicians /pediatricians and other caregivers of children with autism, and thereby improve intervention, diagnosis, social-interaction, and communication competence of bi/ multilingual autistic children in general despite their varied phenotypes. The study found that the majority of children were male and they were diagnosed between age 4-6 years and many others were diagnosed between age 7-9 years; while few of them were diagnosed at age 10-12 years. Professionals at General Hospital and from Child and Adolescent Mental Health Services were mostly responsible for the diagnosis where many were found to be using DSM-IV criteria despite the presence of DSM-V. Awareness and knowledge of ASD is essential in order for parents to avail their children with ASD for earlier detection, diagnosis and interventions as these are significant to an improved language and cognitive capabilities at a later stage of life, and help in ameliorating the main symptoms of this disorder. The study found that the respondents were mostly female and only few were male. For parents, the unavailability of fathers may compound their stress level, and for other caregivers, the low number of males may account for shortage in the number of professionals needed to adequately care for children with ASD.

The research also established some trends of ASD in KwaZulu-Natal. These include presence of learning disability (which is one of the comorbidities of ASD) among the autistic children. This calls for adequate interventions and modern strategies in educating these children. Another result was that ASD is not more prevalent in one culture than in another culture. Also, while culture may influence many decisions parents of children with ASD make before diagnosis, after diagnosis and for the rest of their lives; cultural belief of people may equally influence the manner and time of diagnosis of ASD but not that culture literally increases the rate of ASD. Similarly, this study has refuted the claim that many people in Africa commonly link ASD to witchcraft, spiritual or supernatural causes, though this study found that based on people's lack of knowledge about ASD coupled with their belief; many of them may seek spiritual or supernatural healing and help against ASD.

Furthermore, this study has also revealed professionals' or caregivers' understanding of ASD impact on the life of parents. The trending issue was that General Hospital professionals, special school administrators and their educators, and Child and Adolescent Mental Health Services understand the impact of ASD on the family life of children with ASD. Nonetheless,

the study found that the majority of parents were not using the services of speech and language therapists, occupational therapists, physiotherapy professionals, and social work professionals as the majority of the parents have no idea whether those professionals have understanding of the impact of ASD on parents' family life or not. Similarly, this study established that many parents were satisfied with the support or services of the General Hospital. The study also recorded that many parents were not getting or using the services of speech and language therapists, occupational therapists, social workers and no specific support or interventions could be recorded from those professionals.

Regarding communication methods for interacting with children with ASD, this study established that the majority of children in this study were non-verbal and those who were verbal faced difficulties in both receptive and expressive communications. The common mode of interacting with methods of communicating with them at home and school were largely sign language, and verbal communication combined with sign language, though understanding the meaning of both sign and expressive languages are also difficult for many of these children. These studies explicated instances of nonverbal communication strategies such as eye contact, pointing for the purpose of showing something, using the hands of their parents, and their educators to grab a tool, the employment of gestures (combined with words in some situations) to draw attention among others. However, these children's responses to these non-verbal cues were found to be occasional.

The study also found that though all the participants in the study (the parents, the educators, the speech and language therapists, and the clinicians/pediatricians) were bi/multilingual. However, all of them believed that raising and training these children using two or three languages will aggravate their burden and that their choice was based on advice from professionals and sometimes based on their own assumption or belief. With such an idea, the chances of enhancing linguistic and communicative competence of these children is reduced as they will not enjoy cognitive benefits of using or learning two or more languages. Those who supported two or more languages believed that it must be done with the aid of AAC devices.

In this study, the neurocognitive and psycholinguistic bases of ASD in relation to enhancement of linguistic and communicative competence of children with ASD has been established. The effects of presence or absence of ToM in relation to mental state or mental

representation of concepts, and ASD was established. Notably, half of the educators had little or no knowledge of what constitute ToM and that many children with ASD lack it, and that absence of ToM negatively affects expression of mental state and or mental representation, effective retrieval of information (and inferring) as well as capable of aggravating difficulty in enhancing linguistic and communicative skills among children with ASD. The study also found that the majority of the participants had no idea that ToM is helpful to understand tests such as false belief that has been used to evaluate children's mental state and how people with ASD respond to a false world. Lack of ToM among children with ASD was recorded in this study as the majority of the parents and the educators have revealed in chapter five. This lack of ToM can therefore be associated with some deficits or irregularities found in the verbal and non-verbal communications of children with ASD observed in this study. Without gainsaying, understanding ToM in the context of ASD is essential to put mental processes or mental representation into perspective. This in turn will aid viewing the social-communication and behavioural impairment of children with ASD as complex phenomena that involve secretion and activation of neurons and human cognition for the production of thought, perception, reasoning, learning, communication, and action. The nature and status of the above must be studied and comprehended pertaining to each child with ASD.

In addition, this study recorded the relatedness of language and communication impairments and brain functionality. In this context, it was found that the majority of educators had little or no knowledge about disruption in brain connectivity, and some language and speech therapists, and the clinicians/pediatricians alluded to brain injury while answering the questions posed to them. In relation to that, it was also discovered that the majority of the participants in this study had little or no knowledge about the nature of disruption in brain connectivity, which is significant in understanding neurocognition and neurolinguistics and their interconnection with language and communication of children with ASD. Nonetheless, a few participants saw the possibility of such interconnection. This also calls for broader perspectives of ASD in order to have adequate preparedness for enhancing both the behavioural and social communication of the affected children. Moreover, this study identified that delay, deficit, and absence of language production, acquisition, and development are common among children with ASD. In that regard, the study recorded that grammar, little or no vocabulary, semantics, and pragmatics aspects of language may develop lately or deficiently. The discourse and conversational principles were also found to be deficient among children with ASD. The study also confirmed that the presence of

grammatical errors such as incorrect tense, inability to identify when tense has been changed in conversations, failure in most times to use correct verbs and their corresponding subjects, wrong use of preposition and first-person pronoun among those children who were minimally verbal was also revealed in this study.

The implications of ASD on academic performance of children with ASD were also recorded. It was found that ASD has a profound negative impact on the academic performance of children with ASD, and that many children with ASD were brought to school very late (up to 15 years) and these children did not receive a replica of educational intervention including trainings on behavioural and social communication at home. As children with ASD wanted to have their own world even during teaching, then their interest in academic activities was found to be mostly unstable and thereby poorly affecting their overall academic performance. In addition, the study found that children with ASD have difficulties in speaking, writing, and reading (in isiZulu, which was used to raise the majority of them, and in English, which was exposed to few of these children) when compared to their age-matched typically developing children. This study revealed that schools have been identified to be working well for children with ASD. Moreover, to ensure that these children perform better academically, most special schools have opted to have a few children in a classroom, simplified their lesson tasks or activities, and used some strategies to aid learning. Notably, those children who were minimally verbal also had learning difficulties due to some neurocognitive and psycholinguistic deficits or dysfunctions. Essentially, it should be remembered that learning disability has been mentioned as the commonest comorbid of ASD found among the affected children in this study. These learning problems among children with ASD therefore require adoption or changing to teaching strategies that may enhance their academic performance as well as linguistic and communicative skills.

This study also established that strategies being employed to teach or engage these children by the educators and the speech and language therapists are largely traditional with a few components of Structured Teaching Strategies. It was revealed that the majority of the educators and speech and language therapists were not employing strategies mentioned in ABA, TEACCH, and AAT/ AAC. Meanwhile, as much as effective strategies and interventions are needed, they require sound expertise of the educators, and the speech and language therapists. The strategies or interventions must be culturally appropriate and cost-effective as many parents may not be able to afford those that require using electronic

gadgets. The study also provided a model which sketched core sociolinguistic, neurolinguistics, and psycholinguistic bases of ASD and some knowledge all caregivers (especially the educators and the speech and language therapists) may need for better understanding of ASD in relation to behavioural and social communication skills (in both receptive and expressive language) and with regards to acquisition, production and comprehension of linguistic and communicative acts in either L1, L2, or L3.

8.5 Recommendations

In this study, the majority of the children with ASD displayed low linguistic and communicative skills, and these skills were below average of what may be obtained from their age-matched typically developing children. The following recommendations are formulated and summarized in consonance with the research objectives of the study.

8.5.1 Objective 1: To Investigate Caregivers' Perspectives about the Prevalence of Autism in KwaZulu-Natal and among Different Cultures

The study found that there are some trending issues in this province as regards ASD. The ratio of male and female children with ASD was found to be higher, and their caregivers were below middle-age. The prevalence of ASD was not much in one culture than in another; no witchcraft, spiritual or supernatural cause could be linked to ASD but parents sought spiritual or supernatural healings. It was also found that professionals and caregivers at special schools, General Hospitals, and Child and Adolescent Mental Health Services understand the impact of ASD on family life of the parents of children with ASD while the majority of parents did not engage speech and language therapists, physiotherapists, occupational therapists, and social workers. Only few parents who have received services from speech and language therapists maintained that these professionals also understand the impact of ASD on family life of parents whose children are autistic.

It is recommended that high level of awareness on ASD should be made a priority by the KwaZulu-Natal Department of Health, and KwaZulu-Natal Department of Education, mass media, and professionals in any field that relates to ASD. The above-mentioned government agencies should provide necessary trainings for a section of their personnel (if not all) on how to detect and diagnose ASD using DSM-V criteria. Parents and caregivers should seek scientific interventions after their children have been diagnosed with ASD. Having right people, information, knowledge and action in place may help these children to have chances of increasing their linguistic and communicative competence.

8.5.2 Objective 2: To Examine Method of Autism Diagnoses, and How Satisfied are Parents with the Support or Intervention Received, and What Communicating Methods are being Employed to Interact with Autistic Children

The study found that the diagnosis of ASD was mainly carried out by few professionals at General Hospital and the diagnosis was mostly carried out late with the use of DSM-IV criteria in most cases. It was established in the study that parents received support and services from professionals at special schools, and General Hospitals, and the parents mentioned that they are satisfied. The few parents who received support and services from Child and Adolescent Mental Health Services, speech and language therapists were also satisfied. Concerning the method of communication, it was found that the majority of children with ASD in this study were non-verbal and the main method of communicating with them include the use of words combined with demonstrations, signs, body language, gestures, and pictures. Occasionally, songs and visuals were also used.

It is recommended that professionals who are responsible for ASD diagnosis should ensure that all criteria needed to certify a child as autistic are met, and they should acquaint themselves with DSM-V which contains current diagnostic criteria for ASD. Professionals that work closely with parents and children with ASD should render support in whatever capacity they have, and parents should stick to those professionals that are giving them adequate attention which may positively enhance behaviour and social communication of their children with ASD. Earlier joint attention should be established between the parents and their children with ASD for better introduction and exchange of varied verbal and non-verbal communication cues. Importantly, parents, educators, speech and language and other professionals should understand what works well for enhancing each child's language and communication. The use of augmentative and alternative communication (AAC, a form of assistive technology) is also suggested as it has proven to enhance social interaction and communication, executive function, and cognitive capability regardless each child's ability in verbal and nonverbal communications. It is also suggested that a combined use of words, sign language, songs, demonstrations, and other non-verbal cues should be attempted in some cases where assistive technology is not available.

8.5.3 Objective 3: To Examine the Disposition of Parents, Educators and Clinicians towards the Development and Deployment of Bi/multilingualism by Autistic Children

This study also found that the disposition of the majority of the participants is that raising or exposing children with ASD to bi/multilingualism will compound their ASD burden and that

bi/multilingualism may lead to confusion in selecting and using a particular language for communication and interactions. It was established that while few parents followed their instinct; the majority of the parents were advised by professionals to deploy one language in raising and training their children with ASD. Many educators and speech and language therapists also believed bi/multilingualism alone without alternative and augmentative communication cannot be developed or employed in training these children with ASD.

The main recommendation is that parents, educators, speech and language therapists and all other caregivers should first understand that bi/multilingualism has positive benefits such as improved cognitive ability; therefore, there is a need to expose, raise and train children with ASD with bi/multilingualism even when these children seem to have no ability to speak or use additional language. Educators should also adopt bilingualism for teaching and passing instructions at school and ensuring that L1 is dominant but using the avenue to introduce these children to English or additional language and make them enjoy the possibility of enhancing their cognitive capability. Professionals should be wary of giving confusing and unscientific advice to parents and other non-experts as regards the deployment and development of two or three languages and any other issues that concern ASD.

8.5.4 Objective 4: To Investigate Neurocognitive and Psycholinguistic Bases of Bi/multilingual Autistic Children in KwaZulu-Natal Province

The finding of this study first shed light into the neurocognitive bases of ASD in relation to ToM. The majority of the educators believed that children with ASD have low IQ, while the same number agreed and disagreed that these children express mental state. Also, the majority of the educators disagreed that children with ASD lack ASD and only few affirmed that lack of ToM may aggravate issues on linguistic and communicative competence faced by children with ASD. The majority of the educators and the speech and language therapists had little or no understating about the possibility of lack of ToM to affect the linguistic and communicative competence of children with ASD. This implies that the neurocognitive and psycholinguistic bases of ASD is not known by many educators and language and speech therapists who are seen as part of the main caregivers.

Additionally, the study found that the same number of educators agreed and disagreed to the view that language and communication impairments and brain functionality are interconnected. The majority of these respondents also mentioned that brain impairment or functionality may not affect linguistic and communicative competence of children with ASD.

Some language and speech therapists, and the clinicians/pediatricians alluded to brain injury without emphasizing that brain functionality may affect language and communication. In sum, it was discovered that the majority of the participants had little or no knowledge about the nature of disruption in brain connectivity which is significant in understanding neurocognition and neurolinguistics and their interconnection with language and communication of children with ASD.

Notably, ASD cuts across many disciplines. Therefore, knowledge in one area without basic awareness of another area may hinder effective interventions, support and services targeted at children with ASD by frontline caregivers such as educators, speech and language therapists, and clinicians/pediatricians. It is imperative therefore for these caregivers to familiarize themselves with the neurocognitive and psycholinguistic bases of ASD as such awareness or knowledge may help in enhancing the linguistic and communicative skills of the affected children due to the understanding of some underlying phenomena that physically manifest in these children's social interaction, and language and communication. Workshops, and in-house professional training are essential for educators, speech and language therapists, and clinicians/pediatricians to gain more knowledge about many concepts and theories that relate to ASD and its nexus with language learning, language acquisition, language production and comprehension as well as communication.

8.5.5 Objective 5: To Examine the Implications of Neurocognitive and Psycholinguistics Bases on the Linguistic and Communicative Competence of Bi/multilingual Autistic Children and their Academic Performances

It has been established in this study that neurocognitive and psycholinguistic bases of ASD interconnect with linguistic and communicative skills that individuals with ASD can exhibit. Similarly, it was found that ASD has profound negative effects on the academic performance of children with ASD, despite that schools have been identified by parents as number one places where they have secured support and service. However, school administrators and educators emphasised that many children were diagnosed and brought to school late and had no replica of educational intervention including training on behavioural and social communication at home. Such actions have made learning more tedious for these children.

Moreover, problems with articulation, writing, reading and inferring meaning from books, pictures, (audio)visuals, sign language and verbal communications had been identified as having negative effects on the academic performance of children with ASD. As in the

production and comprehension of expressive and receptive languages in either L1, L2 or L3, word use and sentence structure also have neurolinguistic and psycholinguistic underlying. It was found that only few verbal children with ASD produce one-word utterance (mostly verbs and nouns) to make a request or to respond.

Regarding strategies used by educators and speech and language therapists to impart knowledge to these children, this study also discovered the use of sign language (including demonstration of tasks), pictures, songs, naming cards, and visuals as the main teaching strategies adopted by the educators. Emphasis was also laid on the use of routine in the classroom and the need for educators to understand what each child responds to actively and positively. It was also found that only a few speech and language therapists had deployed modern gadgets such as iPad, tablet and laptop for teaching these children. The educators as well as the speech and language therapists were not using comprehensive and unique pedagogical approaches such as all components of Structured Teaching strategies developed by TEACCH (Training and Education of Autistic and related Communication-handicapped Children), AAT (which requires visualization of everything), and ABA.

The recommendations are as follows. First, diagnosing, and taking children with ASD to school late for admission must be discouraged and avoided and be part of any awareness campaign on ASD in KwaZulu-Natal and beyond. This is premised on the fact that earlier interventions can make a huge difference in acquiring education, and in turn enhance linguistic and communicative competence of children with ASD in either their L1 or in additional language(s). KwaZulu-Natal Department of Education should look into having a separate and simplified curriculum for learners (children) with (neuro)developmental disorders like ASD, as large portions of current curriculum are not suitable for enhancing learning, behavioural and social communication of these children.

What these children really need for day-to-day conversation and interaction with others should be highly focused on the curriculum. Establishing special schools for autism is a welcome idea; however, KwaZulu-Natal Department of Education should intensify equipping and educating existing special schools and other mainstream schools. The majority of children with ASD are currently learning in these schools (especially the mainstream schools), and they have inadequate equipment, and knowledge and skills to meet the needs and give necessary support to children with ASD. It should be remembered that children with ASD cannot be just admitted into mainstream schools without adequate accommodation

that may ensure that each child's needs for benefiting from instructions are met. These accommodations may include the use of adaptive equipment, revising the curriculum, employment of visual materials, and creating individual time to provide what ASD learners need using trained paraprofessionals. All these provisions will help the children with ASD obtain at least minimum educational experience they deserve, and in turn help to enhance their behaviour, linguistic and communication skills.

The use of AAC and visuals are essentially needed to maximise the individualized treatment and attention in the class. There must be identification of what works well for each child. Designing a routine around such strength is essential and parents need to team up with educators to ensure that no learning vacuum emerges even during crises such as COVID-19 pandemic. TV programmes and games with audios have a tendency to motivate children with ASD to learn new concepts as well as additional languages such as English. Teaching words to children with ASD need to be started with morphemes/syllables, applying phonics for articulation before moving to one-word learning. Flashcards, pictures, and emphasis must be placed on context when such words are combined with pictures, demonstration and other non-verbal cues.

Importantly, children or learners with ASD have some unique problems that are not usually faced by other learners; therefore, educators must endeavour to use comprehensive and unique pedagogical approaches to enhance behavioural, linguistic and communicative skills of autistic children. All components of Structured Teaching strategies developed by TEACCH (Training and Education of Autistic and related Communication-handicapped Children), AAT (which requires visualization of everything), and ABA should be deployed to achieve those skills. In addition, educators, and speech and language therapists with sound understanding of ASD are needed to improve the academic as well as the linguistic and communication of these children. Essentially, collaborative relationships among parents of children with ASD and all professionals or other caregivers are vital, and they are also recommended.

8.5.6 Objective 6: To Present Understandable Neurocognitive and Psycholinguistic Model to Increase Caregivers' Knowledge of ASD in Relation to Linguistics and Communication of Bi/multilingual Autistic Children in KwaZulu-Natal and Beyond

The study presented a model that showed the interconnections of ASD and some linguistic fields such as neurolinguistics, psycholinguistics, and sociolinguistics. Some concepts and

theories posed by these fields but relevant to this research were sketched out. It was indicated that the model may benefit caregivers especially the educators and the speech and language therapists as well as clinicians/ pediatricians, child neurologists, child psychologists and others.

Notably, the model may increase caregivers' knowledge and their service delivery, and other above-mentioned interventions and may be promising; however, parents, speech and language therapists, educators, and other interventionists need to consider whether the interventions and other strategies are culturally appropriate in this context. The selected interventions and strategies for enhancing the linguistic and communicative competence of children with ASD should also consider whether to develop their L2 or L3, which may be English language in this context; or to develop their L1 only, which is mainly isiZulu, Afrikaans or other national languages in South Africa in this context, or both languages in sequential or simultaneous manner. Other factors that are needed to be considered include the unique characteristics of each child with ASD, what has been observed as motivation for each to communicate or use language, each child's response to different interventions, cost and intensity of the intervention, and the expertise and training background of caregivers including the educators, the speech and language therapists, and other interventions.

8.6 Suggestions for Further Studies

The focus of this study was to investigate the nature of socio-communication traits of children with autism in KwaZulu-Natal and to suggest ways that may enhance their linguistic and communicative skills. The study was executed in four research sites (that is four locations within KwaZulu-Natal). Expanding the scope of this study may be attempted with the mindset of probing some of the nuances that this research left out due to lack of resources, and due to their non-inclusion ab initio in the objectives of this research. Some of the areas that may be explored further are as follows:

i. Analyzing the impact of neurolinguistics, psycholinguistic and sociolinguistic knowledge of educators and speech and language therapists towards enhancing linguistic and communicative skills of individuals with ASD;
ii. Devising unique pedagogical practices for educators and speech and language therapists towards enhancing linguistic and communicative competence of children with ASD;
iii. Investigating collaborative partnerships among parents and other caregivers of children with ASD in South Africa;

iv. Level of awareness and knowledge of ASD in South Africa: A Cross-professional and Cross-cultural Analysis.

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APPENDICES

Appendix A: University of Zululand Research Ethics Clearance

UNIVERSITY OF ZULULAND
RESEARCH ETHICS COMMITTEE
(Reg No: UZREC 171110-030)

RESEARCH & INNOVATION
Website: http://www.unizulu.ac.za
Private Bag X1001
KwaDlangezwa 3886
Tel: 035 902 6731
Fax: 035 902 6222
Email: DlelanaM@unizulu.ac.za

ETHICAL CLEARANCE CERTIFICATE

Certificate Number	**UZREC 171110-030 PGD 2019/19**						
Project Title	**LINGUISTIC AND COMMUNICATIVE COMPETENCE OF BI/MULTILINGUAL AUTISTIC CHILDREN IN KWAZULU-NATAL, SOUTH AFRICA**						
Principal Researcher/ Investigator	OLUMUYIWA A. KEHINDE						
Supervisor and Co-supervisor	Dr B.X.S Ntombela		Dr C. Hermann				
Department	English						
Faculty	ARTS						
Type of Risk	Med Risk – Data collection from people						
Nature of Project	Honours/4th Year		Master's		Doctoral	x	Departmental

The University of Zululand's Research Ethics Committee (UZREC) hereby gives ethical approval in respect of the undertakings contained in the above-mentioned project. The Researcher may therefore commence with data collection as from the date of this Certificate, using the certificate number indicated above.

Special conditions:

(1) This certificate is valid for 1 year from the date of issue.
(2) Principal researcher must provide an annual report to the UZREC in the prescribed format [due date-24 September 2020]
(3) Principal researcher must submit a report at the end of project in respect of ethical compliance.
(4) The UZREC must be informed immediately of any material change in the conditions or undertakings mentioned in the documents that were presented to the meeting.

The UZREC wishes the researcher well in conducting research.

CHAIRPERSON
UNIVERSITY OF ZULULAND RESEARCH ETHICS COMMITTEE (UZREC)
REG NO: UZREC 171110-30
26 -09- 2019
RESEARCH & INNOVATION OFFICE

Professor Gideon De Wet
Chairperson: University Research Ethics Committee
Deputy Vice-Chancellor: Research & Innovation

25 September 2019

Appendix B: Department of Education Permission to Conduct Research

education

Department:
Education
PROVINCE OF KWAZULU-NATAL

Enquiries: Phindile Duma **Tel:** 033 392 1063 **Ref.:**2/4/8/4011

Mr OA Kehinde
Private Bag X1001
KWADLANGEZWA
3886

Dear Mr Kehinde

PERMISSION TO CONDUCT RESEARCH IN THE KZN DoE INSTITUTIONS

Your application to conduct research entitled: **"LINGUISTIC AND COMMUNICATIVE COMPETENCE OF BI/MULTILINGUAL AUTISTIC CHILDREN IN KWAZULU-NATAL, SOUTH AFRICA"**, in the KwaZulu-Natal Department of Education Institutions has been approved. The conditions of the approval are as follows:

1. The researcher will make all the arrangements concerning the research and interviews.
2. The researcher must ensure that Educator and learning programmes are not interrupted.
3. Interviews are not conducted during the time of writing examinations in schools.
4. Learners, Educators, Schools and Institutions are not identifiable in any way from the results of the research.
5. A copy of this letter is submitted to District Managers, Principals and Heads of Institutions where the Intended research and interviews are to be conducted.
6. The period of investigation is limited to the period from 28 October 2019 to 10 January 2022.
7. Your research and interviews will be limited to the schools you have proposed and approved by the Head of Department. Please note that Principals, Educators, Departmental Officials and Learners are under no obligation to participate or assist you in your investigation.
8. Should you wish to extend the period of your survey at the school(s), please contact Miss Phindile Duma at the contact numbers below.
9. Upon completion of the research, a brief summary of the findings, recommendations or a full report/dissertation/thesis must be submitted to the research office of the Department. Please address it to The Office of the HOD, Private Bag X9137, Pietermaritzburg, 3200.
10. Please note that your research and interviews will be limited to schools and institutions in KwaZulu-Natal Department of Education.

UMLAZI DISTRICT **PINETOWN DISTRICT** **MZINYATHI DISTRICT**
UMGUNGUNDLOVU DISTRICT **KING CETSHWAYO DISTRICT**

Dr. EV Nzama
Head of Department: Education
Date: 19 November 2019

..Championing Quality Education - Creating and Securing a Brighter Future

KWAZULU-NATAL DEPARTMENT OF EDUCATION
Postal Address: Private Bag X9137 • Pietermaritzburg • 3200 • Republic of South Africa
Physical Address: 247 Burger Street • Anton Lembede Building • Pietermaritzburg • 3201
Tel.: +27 33 392 1063 • **Fax.:** +27 033 392 1203• **Email:**Phindile.Duma@kzndoe.gov.za •**Web:**www.kzneducation.gov.za
Facebook: KZNDOE....Twitter: @DBE_KZN....Instagram: kzn_education....Youtube:kzndoe

Appendix C: Questionnaire for Parents and Educators

QUESTIONNAIRE ON LINGUISTIC AND COMMUNICATIVE COMPETENCE OF BI/MULTILINGUAL AUTISTIC CHILDREN IN KWAZULU-NATAL, SOUTH AFRICA VOLUNTARY QUESTIONNAIRE FOR PARENTS AND EDUCATIORS OF CHILDREN WITH AUTISM

Researcher: Mr O.A. KEHINDE

Supervisor: Dr B.X.S. Ntombela

Co-supervisor: Dr C. Hermann

Faculty of Arts

Department of English

University of Zululand

Dear respondent,

I am a doctorate degree student of the above named university and conducting a research study on **"Linguistic And Communicative Competence Of Bi/Multilingual Autistic Children In Kwazulu-Natal, South Africa".** This research study is purely an academic exercise and does not in any way have negative implications whether personal, political, economic, religious or social.

Please do not write your name anywhere on the questionnaire, this will ensure that your identity is not revealed.

You are therefore requested to fill this questionnaire with utmost confidentiality.

Thank you for your cooperation.

Yours sincerely,

O.A. KEHINDE

Questionnaire for Parents

Dear respondents, kindly read carefully and provide adequate information for each question. Your identity and information will be kept confidential and for the purpose of this research only. Please complete this questionnaire if your child has autism or autistic traits. By this, it means children diagnosed with autism, Asperger Syndrome and other diagnoses on the autism spectrum and children not diagnosed, but showing autistic traits, whether or not they have been assessed.

Tick the box, or choose option for each question. Where necessary, kindly write your answers. Thanks.

---

1. Age ☐ **Gender:** ☐ **Employment status:** ☐

2. Level of Education: Matric ☐ **Diploma** ☐ **First Degree** ☐ **PGCE/ Masters** ☐ **PhD** ☐

3. Number of languages with proficiency ☐

4. Age of your child with autism ☐ **5. Your child's gender is:Male** ☐ **Female** ☐

6. Age he/she was diagnosed? ☐ **7. How many siblings does your child have?** ☐

8. My child...

has been diagnosed with an autism spectrum condition (including Asperger syndrome) or autistic traits.

has been through assessment but was not diagnosed as having an autistic spectrum condition.

is waiting for assessment.

does not have a diagnosis because we have not yet asked for an assessment.

has been refused an autistic spectrum condition assessment.

9. My child has further additional needs due to:learning disability ☐ physical disability or sensory impairment ☐

Both ☐

10. We live in:

Richards Bay ☐ **Durban** ☐ **Pietermaritzburg** ☐ **Empangeni** ☐

11. My child received his/her diagnosis of autistic spectrum condition from:

The Child Development Centre ☐ General Health Centre ☐

Child and Adolescent Mental Health Service ☐ Paediatrician ☐

Not diagnosed ☐

Other ☐

12. My child attends one of the following places:

mainstream school or nursery/preschool/early years setting ☐

school for children with special needs ☐ college ☐

autism centre (Private) ☐ is in employment or supported work ☐

training /further education /adult education ☐

Other (e.g. independent sector, home schooling) ☐

13.We receive support from the following services (please tick all that apply)

Speech and Language Therapy ☐

Occupational Therapy ☐ School Teachers/ Educators ☐

Child and Adolescent Mental Health Service Physiotherapy ☐

Other physical health services Early ☐

N/A ☐

Other ☐

Your answers to the following questions will help us understand what is working well or not working well for children and families.

14. If your child/young person has been offered an assessment for an autistic spectrum condition in the last 24 months, how satisfied were you with the process?

	Very Unsatisfied	Unsatisfied	Neutral	Satisfied	Very Satisfied	N/A
Select one box						

Were you provided any particular feedback on this issue.

Yes ☐ No ☐

Tick how many languages do you expose him or her to?

1 ☐ 2 ☐ 3 ☐

If you pick 1, 2 or 3 language(s) tick any of the options below to state why.

Based on professional advice ☐

Based on personal belief ☐

Based on what others advised ☐

How many languages do you use to communicate with him/ her at home?

1 ☐ 2 ☐ 3 ☐

Please state why you communicate with him/her using 1, 2 or 3 different languages.

Based on professional advice ☐

Based on personal belief ☐

Based on what others advised ☐

15. If your child has used any of the services listed below in the last 24 months, please tell us how satisfied you were with the support you received with regard to your child's autism/autistic traits.

	Very Unsatisfied	Unsatisfied	No Opinion/ Don't Know	Satisfied	Very Satisfied	NA
General Hospital						
Speech and Language Therapy						
Occupational Therapy						
Child and Adolescent Mental Health Service (CAMHS)						
Physiotherapy						
Early Help Services - Targeted Youth						
Early Help Services - Enhance						
Early Help Services Children's Centres						
Autism West Midlands						
Other voluntary sector services						
Social Workers						
Education Access Service (Education Welfare)						
Schools/Colleges/Early Years (Nursery)						
Short Breaks						
Employers/Supported Work						
Job Centre						
Leaving Care Team						
Other Physical Health Services						
Police						
Information, Advice and Support Services (IASS)						
Enable						

16. Professionals understand the impact of autism spectrum disorder upon my family life.

If you have accessed services in the past 24 months, please indicate how strongly you agree or disagree with this statement (please comment on all services that apply).

	Strongly Disagree	Disagree	No Opinion/ Don't Know	Agree	Strongly Agree	N/A
General Hospital Professionals						
Speech and Language Therapy Professionals						
Occupational Therapy Professionals						
Child and Adolescent Mental Health Service (CAMHS) Professionals						
Physiotherapy Professionals						
Early Help Services - Targeted Youth Professionals						
Early Help Services - Enhance Professionals						
Early Help Services Children Centres Professionals						
Autism West Midlands Professionals						
Other voluntary sector services Professionals						
Social Workers Professionals						
Education Access Service Professionals						
Schools/Colleges/Early Years (nursery) Professionals						
Employers/Supported Work Professionals						
Job Centre Professionals						
Leaving Care Team Professionals						
Enable Professionals						
Information, Advice and Support Services (IASS) Professionals						
Police Professionals						
Other Physical Health Services Professionals						

17. Where do you access services? Please tick all that apply.

Richards Bay ☐ **Durban** ☐ **Pietermaritzburg** ☐ **Empangeni** ☐

Other ☐

18. Do you access any services at a local school?

Yes ☐ No ☐

If you answered yes to 18, please state the name of the service(s)

Service from Occupation Therapist ☐ Service from Speech and Language Therapist ☐

Service from Educators ☐ Service from all of the above ☐

19. Please rate the school services: Very dissatisfied ☐ Dissatisfied ☐ Satisfied ☐ Very Satisfied ☐

20. Where would you like to access more services?

From Special Schools ☐ From Health Centres ☐ From other relevant professionals ☐

Information Sharing and Communication

21. Would you like service providers including the school to share information about your child?

Yes ☐ No ☐

22. How strongly do you agree with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I have thought that autism is common to some culture or caused by witchcraft or other spiritual problems.					
My child's ASD conditions will improve with time.					
I know where to go for support like financial support, short breaks, family relations, etc.					
Professionals understand how services work together and are able to guide me/us.					
My child's language and communication will improve with time if all service providers or caregivers work well on him/her.					

23. Please give an example of what has worked well to support your child with autism/autistic traits.

Learning at school only ☐ Healthcare services only ☐

Attention from a professional ☐ Attention from various and relevant professionals ☐

SECTION B

*Deficits in nonverbal communicative behaviours used for social interaction; ranging from poorly integrated verbal and nonverbal communication, through abnormalities in eye contact and body-language, or deficits in understanding and use of nonverbal communication, to total lack of facial expression or gestures. (BASED ON DMS-V CRITERIA) * Answer Key: 1= Often 2= Sometimes 3= Never*

1. In general, will s/he look you or others in the eye when s/he wants something or when s/he is talking to you?
   1 ☐ 2 ☐ 3 ☐
2. Does s/he turn his/her head to look at you when you start talking to him/her or doing things next to him/her? When you call his or her name?
   1 ☐ 2 ☐ 3 ☐
3. If you are right in front of him/her, does s/he turn his or her eyes to avoid looking at you?
   1 ☐ 2 ☐ 3 ☐
4. Will s/he look where you point when you point to show him/her a toy or a picture in a book?
   1 ☐ 2 ☐ 3 ☐
5. Does s/he ever use your hand like a tool, grab it and place it on what she wants?
   1 ☐ 2 ☐ 3 ☐
6. Does s/he use simple gestures to direct your attention or to request something; e.g., pointing at a toy, reaching up to be picked up, waving bye-bye to let you know s/he wants to go?
   1 ☐ 2 ☐ 3 ☐
7. Does s/he use words and gestures together (coordinate use of words and gestures); e.g., pointing to an object and saying "look" waving bye-bye and saying "bye-bye," shaking his/her head and saying "no?"
   1 ☐ 2 ☐ 3 ☐
8. Does his/her face show a range of emotional expressions that match the situation, e.g., does s/he smile, frown, raise his or her eyebrows in surprise?
   1 ☐ 2 ☐ 3 ☐

Choose the correct answer for the question below using the key:
1. Very Inadequate 2 Inadequate 3 Adequate 4 Very Adequate

9. How does s/he respond when you use a gesture or facial expression to communicate with him/her, e.g., when you shake your head "no" or frown?

   1. Very Inadequate 2 Inadequate 3 Adequate 4 Very Adequate

Uhla lwebibuzo eqondene nabazali

Siyabingela, ngokuzithoba fundisisa bese unikeza izimpendulo ezifanele kumbuzo ngamunye. Imininingwane eqondene nawe izogcinwa iphephile ngokwenhloso yalolucwaningo. Sicela kuba loluhla lwemibuzo uma ngabe ingane yakho ine-Autism. ngokuphendula loluhla, lokho kuchaza ukuthi ingane noma izingane ezine-autism noma izici ze-autism kanye nezingane ezingakahlolwa/xilongwa zathalakala ukuthi zine-autism kodwa ezinezici noma izimpawu ze-autism.

Beka uphawu u-tick kwibhokisi, or noma ukhethe impendulo eyodwa kumbuzo ngamunye. La kudingeka khona imendulo uyibhale. siyabonga

---

1. Iminyaka ☐ **Ubulili:** ☐ **umsenzi owenzayo:** ☐

2. Imfundo Ngaphansi kwebanga-12 ☐ **Ibanga-12** ☐ **idiploma** ☐ **Degree yokuqala** ☐

Isiqu esiphezulu ☐ **Iziqu zobudokotela** ☐

3. . Inani lezilimi okwazi ukuzikhuluma ☐

4. Iminyaka yengane yakho ephila nge-autism ☐ **5. Ubulili bengane yami: Umfana** ☐

Intombazane ☐

6. Imuphi unyaka okwatholakala ngawo ukuth uphila nge-Autism ☐

7. Ilamana nezingane ezingaki ingane yakho? ☐

8. Ingane yami...

Ineskhathi itholakele ukuth inesimo sokugula esibizwa nge-Autism (okubalwa kuso i-Asperger syndrome) okanye izici ze-Autism
Kade kwenziwa ukuhlolwa kodwa imiphumela iveza ukuthi ayinayo i-Autism

Isalindele ukuhlolwa

Ayinaso isifo ngokuba asikaze senze isicelo sokuhlolwa

Inqabile ukuhlowa isifo se-Autism

9. Ingane yami idinga usizo olwengeziwe ngenxa : yokukhubazeka ekufundeni ☐ yokukhubazeka okusemzimbeni ☐

Okunye ☐

10. Sihlala:

Richards Bay ☐ **Durban** ☐ **Pietermaritzburg** ☐ **Empangeni** ☐

11. Ingane yami ithola ukuxilongwa/ukunakekeleka kwi-Autism :

Enkulisa bantwana ☐ Endaweni yabaphila ngokugula ☐

Endaweni yezingane eziphila ngokukhubazeka ngokomqondo ☐ Kudokotela wezingane ☐

Ayixilongiwe ndawo ☐

Okunye ☐

12. Ingane yami ifunda/yaya e- :

Esikoleni esijwayelekile noma egumbini lezingane/isikole sangaphambi kwesikole/enkulisa ☐

☐

Esikole sezingane eziphila ngokukhubazeka

Ekolishi ☐

Emsebenzini ☐

Iyaqeqeshwa /Iqhuba izifundo /yenza imfundo yabadala ☐

Okunye (kungaba umkhakha ozimele, imfundo yasekhaya) ☐

13. Sithola uxhaso kulezindawo ezilandelayo (bonisa ngophawu kulamabhokisi alndelayoplease)

Isazi sokukhuluma nesezilimi ☐

Okwelapha emsebenzini ☐ Kothisha esikoleni ☐

Endaweni yabantwana abaphila ngokukhubazeka ngokwengqondo ☐

okunye okungaba isikhungo

sabaphila ngokukhubazeka ☐

Akukho ☐

Okunye ☐

Izimpendulo zakho kulemibuzo elandelayo izosilekelela ukuqonda okuyikhona osebenza kahle noma okungasebenzi kahle ezinganeni nasemindenini.

14. Uma ingane yakho ike yanikezelwa ngokuxilongwa noma nokuhlohlwa i-Autism eminyakeni emibili eyendlule, ngabe kube njani ukuneliseka kwakho ngalokho?

	Kube kukhulu ukunganeliseki	Anginelisekile	Anginaso isiqiniseko	Ngenelisekile	Ngeneliseke kakhulu	Angazi
Khetha ibhokisi elilodwa						

Sicela usinike noma ngabe yimuphi umphumela kulenkinga.

☐

Bonisa ngophawu (tick) ukuth ngabe zingaki izilimi omufundise zona?

1 ☐ 2 ☐ 3 ☐

Sicela uma ukhethe olulodwa uchaze ukuthi kungani?

☐

Bonisa ngophawu (tick) ukuthi zingaki izilimi ozisebenzisa mangabe ukhuluma naye ekhaya?

1 ☐ 2 ☐ 3 ☐

Uma ukhethe olulodwa, sicela unikeze isizathu esenza ungasebenzisi izilimi okungenani ezimbili kuya kwezintathu uma ukhuluma naye?

15. Uma ingane yakho ike yasebenzisa enye yezinsiza ezibaliwe kulezi ezilandelayo eminyakeni emibili eyendlule, Sicela usitshele ukuthi ngabe wathola ukuneliseka okungakanani ngoxhaso owaluthola ngokugula kwengane yakho nge-Autism:

	Kubi kukhulu ukunganeliseki	Angenelisekile	Anginaso isiqiniseko	Ngenelisekile	Ngineliseke kakhulu	
Isibhedlela sabagulayo bonke						
Isazi sezilimi nokukhuluma						
Ukwelashwa emsebenzini						
Endaweni yabantwana abakhubazeke ngokomqondo (CAMHS)						
Ukwelashwa ngokomzimba						
Usizo oluqondene nabasebasha						
Usizo olukhuthaziwe lwabancane						
Ilapho kusizwa khona izingane						
I-Autism West Midlands						
Neminye imikhakha enikezela ngosizo						
Osonhlalakahle						
I-Education Access Service (usizo lezokufunda)						
Izikole/amakolishi/izikole zabantwana (Nursery)						
Usizo lwesikhashana						
Abasebenzi/umsebenzi osekiwe						
Endaweni yomsebenzi						
Abasebenza ngokunakekela okuphuthumayo						
Nizinye izinsiza eziphathelene nomzimba						
Amaphoyisa						
Ila kunikezelwa ngolwazi losizo (IASS)						
I-Enable						

Uma ufisa ukuphawula mayelana nempendulo enikeziwe kunombolo ye-13, Sicela usebenzise ibhokisi elingenzansi.

16. Osolwazi bayaqonda ngembangela ye-autism emndenini wami.

Uma sewake waluthola usizo eminyakeni emibili eyendlule, sicela ukuveze ukuthi kuthi uvumelana noma uphikisana kangakanani nalolo lwazi (sicela ubeke uvo lwakho la kudingeka khona).

	Angivumelani kakhulu	Angivumi	anginasqinieko	Ngiyavuma	Nginesqinisekiso esikhulu	Lutho
Isibhedlela sabagulayo bonke izinjulalwazi						
Isazi sezilimi nokukhuluma izinjulalwazi						
Ukwelashwa emsebenzini izinjulalwazi						
Endaweni yabantwana abakhubazeke ngokomqondo (CAMHS) izinjulalwazi						
Ukwelashwa ngokomzimba izinjulalwazi						
Usizo oluqondene nabasebasha izinjulalwazi						
Usizo olukhuthaziwe lwabancane izinjulalwazi						
Ilapho kusizwa khona izingane izinjulalwazi						
I-Autism West Midlands izinjulalwazi						
Neminye imikhakha enikezela ngosizo izinjulalwazi						
Osonhlalakahle izinjulalwazi						
I-Education Access Service (usizo lezokufunda) izinjulalwazi						
Izikole/amakolishi/izikole zabantwana (Nursery) izinjulalwazi						
Abasebenzi/umsebenzi osekiwe izinjulalwazi						
Indawo yomsebenzi izinjulalwazi						
Abasebenza ngokunakekela okuphuthumayo izinjulalwazi						
I-Enable izinjulalwazi						
Ila kunikezelwa ngolwazi lokusizakala (IASS) izinjulalwazi						
Amaphoyisa izinjulalwazi						

Nizinye izinsiza eziphathelene nomzimba

17. Ikuphi la othola khona usizo? Sicela ubeke uphawu olukhombisa lokho kumabhokisi angezansi.

Richards Bay ☐ **Durban** ☐ **Pietermaritzburg** ☐ **Empangeni** ☐

Okunye

18. Ngabe uyaluthola yini usizo ezikolezi ezisondelene nawe?

Yebo ☐ Cha ☐

Uma impendulo yakho ithe yebo kumbuzo we-18, sicela usho indawo/usizo

19 Sicela unikeze indle usizo obelungakhona: Ngineliseke kakhulu ☐ **Anginelisekanga** ☐ **Ngenelisekile** ☐

20. Ikuphi lapho khona odinga khona olunye usizo olwangeziwe?

21. Ungathanda ukuthi kunizelwe ngolwazi olumayelana nengane yakho?

Yebo ☐ Cha ☐

Uma uthi yebo, (nikeza isizathu ngezansi)

22. Unesiqiniseko esingakanani kuthi uyavumelala nalesi sitatimende?

	Ngyavuma kakhulu	Ngiyavuma	Anginasiqiniseko	angivumelani	Angivumi Kakhulu
Nginomuzwa wokuthi i-autism yisifo esingadalwa ukutha-katha noma izinkinga zemimoya					
Isimo somntwana wami okuyi-ASD sizolunga.					
Ngiyazi la engingaya khona uma ngidinga usize lwezezimali noma olupha-nezemindeni njil.					
Abacubunguli bayaqonda ukuthi izinto zisebenza kanjani futhi bayakwazi ukusiluleka kahle.					
Ukukhuluma kahle kwengane yami kahle kwencike kumsebenzi ozokwenziwa					

Sicela usebenzise lesiskhala esingezansi ukubeka uvolwakho ngalokhu.

23. Sicela unike isibonelo ukuthi ngabe ukuphi okusebenze kahle ukulekelela ingane yakho kwi-autism/izici ze-autism.

ISIQEPHU B

Ukusilela ekusebenziseni ukuxhumana okungakhulumi kodwa okwezimpawu; kusukela ekuxhumaneni okungekho esimeni esifanele kuya ekuxhumaneni ngokwezimpawu ezibonakalayo, kusukela esimeni samehle angekho esime ni kanye nokuxhumana ngokusebenzisa izitho zomzimba, noma ukusilela ekuqondeninasekusebenziseni ukuxhumana kwezimpawu noma okungelona iqiniso, nokunganeliseki ekuchachambeni kobusoto. *(BASED ON DMS-V CRITERIA)* *
Indlela yokuphendula: 1= kujwayelekile 2= kwesinye isikhathi 3= Akukaze

2. Ngokusobala, uyakubuka yini wena nabanye emehlweni uma efuna into ethize noma uma ekhuluma nawewhen ?
   1 ☐ 2 ☐ 3 ☐
2. Uyalijikisa yini ikhanda akubuke uma ukhuluma naye noma uma wenza ezinye ezinto eceleni kwakhe? Noma ubiza igama lakhe?
   1 ☐ 2 ☐ 3 ☐
3. Uma umi phambi kwakhe, uyawajikisa yini amehlo ache ukugwema ukukbuka?
   1 ☐ 2 ☐ 3 ☐
4. Engabuka yini la okhomba khona uma umkhombisa ithoyizi noma isithombe encwadini?
   2 ☐ 2 ☐ 3 ☐
5 Uke asenze yini ithuluzi isandla sakho ukubamba izinto noma ukuthatha into akayifunayo?
   1 ☐ 2 ☐ 3 ☐
6. Uke asebenzise yini isihe uma efuna unmake noma uma ecela okuthize, isib. Akhombe ithoyizi, noma mayefuna ukuqukulwa, noma futhi uma ekhombisa ngesandla ukuthi useyahamba?
   1 ☐ 2 ☐ 3 ☐
7. Kuyenzeka yin ukuth akhombise amazwi anobubele/isihe, isib. Akhombe into ethize athi “buka” aphinde athi useyahamba/uyvalelisa wena, futhi aphinde akhombise ngesandla ukuthi akafuni?
   1 ☐ 2 ☐ 3 ☐
8. Ngabe ubuso bakhe buke bukhombise ukushitshashintsha ngenxa yezimo ezahlukukene ezenzekayo kuye, isb. Ngabe uyakhona ukumoyizela, noma avuse amashiya okukhomba ukumangala ?
   1 ☐ 2 ☐ 3 ☐
9. ☐

Questionnaire for Educators

Dear respondents, kindly read carefully and provide adequate information for each question. Your identity and information will be kept confidential and for the purpose of this research only. Please complete this questionnaire if your learners have autism or autistic traits. By this, it means children diagnosed with autism, Asperger Syndrome and other diagnoses on the autism spectrum and children not diagnosed, but showing autistic traits, whether or not they have been assessed.

SECTION A

1. Age ☐ **Gender** ☐

2. Level of Education: Matric ☐ **Diploma** ☐ **First Degree** ☐ **Masters** ☐ **PhD**

3. Years of teaching experience with children with ASD ☐

4. Number of languages with proficiency ☐

5. Number of language(s) used in teaching children with ASD ☐

	Cognitive Bases of autism / ToM	Strongly Agreed	Agreed	Neutral	Disagree	Strongly Disagree
1.	Most children with autism have below-average IQ and that poses learning difficulties.					
2.	Most children with autism have challenge in expressing mental states or cognitive states like pretending, saying they know, think.					
3.	Most children with autism struggle to understand other people's beliefs, attitudes, and emotions as a result of lack of Theory of Mind – ToM- that is, (mind which refers to the idea of understanding different mental states-such as belief, desire and knowledge-that enables us to explain and predict others' behaviour).					
4.	The absence of the 'Theory of Mind' in autistic children contributes to challenges of linguistic and communicative competence of the autistic kids.					

	Neurolinguistic Bases of Autism					
5.	Language and communication impairments are related to brain functionality and processes.					
6.	Disruption in Broca's area, angular gyrus, insular cortex, or Wernicke's area of the brain contributes to challenges of linguistic and communicative competence of autistic children.					
7.	Neurolinguistic study/ assessment could reveal abnormal, delayed, or absence of both receptive and expressive language impairment in autistic children.					
8.	Verbal intelligence (VIQ) of children with autism can be assessed through performance on one or more tests involving receptive and/or expressive spoken language.					
	Psycholinguistics Bases of Autism					
9	Language production, acquisition, and development can be delayed, be in deficit, or be absent in autistic children.					
10.	Among children with autism, echolalia, and 'language regression' which means difficulties of skill acquisition and frequent loss of or failure to use existing language and social skills after normal development are common among children with autism.					

11.	Deficiency in mental processes involved in the comprehension, production, and acquisition of language(s) influence the overall linguistic and communicative competence of autistic children.					
12.	Semantics, grammar, and pragmatics aspects of language may develop lately or deficiently among children with autism unlike children without autism.					
13.	There is absence or deficiency of discourse or conversational principles (e.g. politeness, turn taking, making formal conversations).					
	Bi/ Multilingualism and Autism					
14.	Exposing children with autism to two or three languages will complicate burdens associated with ASD.					
15.	For the children with ASD who are verbal, English, IsiZulu (or other languages) can be learned, developed, and used in various contexts of communication.					
16.	With earlier interventions and adequate support from qualified educators, clinicians, family members, and speech therapists; the linguistic and communicative competence of children with autism could be improved.					

SECTION B

*Deficits in nonverbal communicative behaviours used for social interaction; ranging from poorly integrated verbal and nonverbal communication, through abnormalities in eye contact and body-language, or deficits in understanding and use of nonverbal communication, to total lack of facial expression or gestures. (BASED ON DMS-V CRITERIA) * Answer Key: 1= Often 2= Sometimes 3= Never*

1. In general, will s/he look you or others in the eye when s/he wants something or when s/he is talking to you?

   1 ☐ 2 ☐ 3 ☐

2. Does s/he turn his/her head to look at you when you start talking to him/her or doing things next to him/her when you call his or her name?

   1 ☐ 2 ☐ 3 ☐

3. If you are right in front of him/her, does s/he turn his or her eyes to avoid looking at you?

   1 ☐ 2 ☐ 3 ☐

4. Will s/he look where you point when you point to show him/her a toy or a picture in a book?

   1 ☐ 2 ☐ 3 ☐

5 Does s/he ever use your hand on a tool, grab it and place it on what she wants?

   1 ☐ 2 ☐ 3 ☐

6. Does s/he use simple gestures to direct your attention or to request something; e.g., pointing at a toy, reaching up to be picked up, waving bye-bye to let you know s/he wants to go?

   1 ☐ 2 ☐ 3 ☐

7. Does s/he use words and gestures together (coordinate use of words and gestures); e.g., pointing to an object and saying "look," waving bye-bye and saying "bye-bye," shaking his/her head and saying "no?"

   1 ☐ 2 ☐ 3 ☐

8. Does his/her face show a range of emotional expressions that match the situation, e.g., does s/he smile, frown, raise his or her eyebrows in surprise?

   1 ☐ 2 ☐ 3 ☐

9. How does s/he respond when you use a gesture or facial expression to communicate with him/her, e.g., when you shake your head "no" or frown?

*Interview/ questions were adapted from some sources such as : the ADI-R (Lord et.al., 1994), the Parent Interview for Autism – Clinical Version (Stone et.al., 2002), the First Year Inventory (Reznick et.al., 2007), the Communication and Symbolic Behavior Scales Developmental Profile Caregiver Questionnaire (Wetherby & Prizant, 2002), the CARS-2 Questionnaire for Parents or Caregivers (Schopler et.al., 2010); and The illness perception questionnaire (IPQ) and its revision (IPQ-R), (IPQ; Weinman et al. 1996; Moss-Morris et al. 2002;& Mire et al. 2017).

Appendix D: Interviews Guide for Educators, Speech and Language Therapists, Clinicians/Pediatricians, and a Checklist for Classroom Observations

I. Interview Guide for Educators

Kindly answer the following questions to the best of your knowledge.

1. Should bilingualism or multilingualism be encouraged among children diagnosed with autism? If yes or no, why?
2. Is ASD common in one culture compared to another culture?
3. Are you aware that 'Theory of Mind' affects the linguistic and communicative competence of the autistic children? If yes, how does it affect it?
4. Do you have knowledge that disruption or abnormality in brain connectivity affects the linguistic and communicative competence of children with autism?
5. Do supportive and encouraging social and linguistic environments (at home and school especially) have an impact on the language and communication competence of children with autism? If yes, what impact do they have?
6. What types of common challenges do children with autism who are verbal have in generating word, using words, and structuring sentences?
7. Among children with autism who are verbal, what common grammatical errors are prevalent in their language and communication? (This may include using tense, pronouns, subject-verb agreement, speaking out of context or situation)
8. How well do children with autism who are verbal write or read when compared to their age-matched non-autistic children?
9. What types of teaching methodologies or strategies do you employ to impart knowledge to these bi/multilingual children with autism?
10. What influence does ASD has on the academic performances of children diagnosed with autism?

II. Interview Guide for Clinicians and Paediatricians

1. Is Autism Spectrum Disorder (ASD) common in one culture compared to another culture?
2. Should learning and usage of more than a language be encouraged among children with autism? If yes or no, why?
3. What are the trends of ASD in KwaZulu-Natal Province?
4. What are the common features of ASD in children you diagnosed or you have been given care to so far?
5. What methods are being employed to detect, diagnose and manage children with ASD?
6. What other problems that require medical attention children with autism usually face?
7. Are these problems lifelong as autism disorder itself?

III. Interview Guide for Speech and Language Therapists

Kindly answer the following questions to the best of your knowledge.

1. Does Autism Spectrum Disorder (ASD) rampant in one culture when compared to another culture?
2. What are the trends of ASD in KwaZulu-Natal Province?
3. Should learning and usage of more than a language be encouraged among children with autism? If yes or no, why?
4. What types of articulation or pronunciation challenges do children with autism experience? 4. What types of challenges do children with autism who are verbal have in word use and sentence structure?

5. What are the common grammatical errors found in the language of children with autism who are verbal? (Examples may include using tense, pronouns, subject-verb agreement).
6. How well do children with autism who are verbal write or read when compared to their age-matched to the non-autistic children?
7. What methods do you use as a speech therapist to engage children with autism, and to improve their language and communication deficits?

IV**. A Checklist for Classroom Observations**

This checklist guides observation of lessons in each participating school. It includes basic linguistic and communicative performances and relevant communication skills stated in Communications Matrix (Rowland, 2012). The observation guides include the following.

1. Types of language and communication impairments found among children with autism in the class.
2. Linguistic and communicative techniques/ skills/ activities employed by educators in the class during any teaching, or teaching language and communication?
3. Level of linguistic comprehension in either of L1, L2, or L3 or in all (this may be assessed if learners are verbal and use or respond to more than a language in the class).
4. How well do the children with autism read and write.
5.The linguistic and communicative competence that includes four broad categories- linguistic, sociolinguistic, discourse, and strategic competence will be observed among the children with autism. This is line with linguistic and communicative items provided in Communicative Matrix. These include what the child does to show or say s/he:

A. Refuses or Rejects Something B. Requests More of an Action C. Requests a New Action D. Requests More of an Object E. Makes Choices F. Requests a New Object G. Requests Objects that are Absent H. Requests Attention I. Shows Affection J. Greets People K. Offers or Shares Things L. Directs Your Attention to Something M. Uses Polite Social Forms N. Answers "Yes" and "No" Questions O. Asks Questions P. Names Things or People Q. Makes Comments

Each of the above would be examined under the broad communicative acts, which may include one or more of *body movement, facial expression, visual, simple gestures, conventional gestures and vocalizations, concrete symbols, abstract symbols, and language use.*

Appendix E: Participant Informed Consent

INFORMED CONSENT DECLARATION (Participant)

Project Title: **Linguistic and Communicative Competence of Bi/Multilingual Autistic Children in Kwazulu-Natal, South Africa.**

Mr Olumuyiwa Adekunle Kehinde from the Department of English, Faculty of Arts, University of Zululand has requested my permission to participate in the above-mentioned research project. The nature and the purpose of the research project, and of this informed consent declaration have been explained to me in a language that I understand.

I am aware that:

1. The purpose of the research project is to investigate the
2. The University of Zululand and the Department of Education have given ethical clearance and permission to conduct this research project and I have seen/ may request to see the clearance certificate.
3. By participating in this research project I will be contributing towards the enhancement of language and communication skills and childhood education of autistic children in KwaZulu-Natal, South Africa.
4. I will participate in the project by in completing the research questionnaire or responding to the interview questions that will be provided by the researcher.
5. My participation is entirely voluntary and should I at any stage wish to withdraw from participating further, I may do so without any negative consequences.
6. I will not be compensated for participating in the research.
7. There are no risks associated with my participation in the research.
8. The researcher intends publishing the research results in the form of research article. However, confidentiality and anonymity of records will be maintained and that my name and identity will not be revealed to anyone who has not been involved in the conduct of the research.
9. I will not receive feedback/will receive feedback in the form of …… regarding the results obtained during the study.
10. Any further questions that I might have concerning the research or my participation will be answered by Olumuyiwa A Kehinde: 0604037323
11. By signing this informed consent declaration I am not waiving any legal claims, rights or remedies.
12. A copy of this informed consent declaration will be given to me, and the original will be kept on record.

I, ……..have read the above information / confirm that the above information has been explained to me in a language that I understand and I am aware of this document's contents. I have asked all questions that I wished to ask and these have been answered to my satisfaction. I fully understand what is expected of me during the research.

I have not been pressurised in any way and I voluntarily agree to participate in the above-mentioned project.

……. …….

Participant's signature **Date**

Appendix F: Acceptance Letters of Attended Conferences

South African Education Research Association

Promoting and supporting research in education

Website: www.saera.co.za

SAERA 2019 CONFERENCE

13 July 2019

Dear Mr OA Kehinde, R BXS Ntombela and Dr C Hermann

We are pleased to inform you that your abstract, SAERA 2019-122 (The Psycholinguistic and Neurolinguistic Nature of Communications and Education in Early Development of Bi/multilingual Autistic Children) has been accepted for presentation at the Annual Conference of SAERA at the Elangeni – Maharani Hotel, Durban from Wednesday 23rd – Friday 25th October 2019

You are invited to attend the conference and present the paper. A registration form is attached.

Please take note:

Due date for registration:	12 August 2019
Due date for payment and proof of payment:	30 September 2019

Delegates need to submit proof of payment on or before the due date to ensure attendance/presentation at the conference.

Regards

PLawson

Ms Petra Lawson
Conference Administrator (SAERA 2019)
E-mail: conferencepl@gmail.com
Fax to mail: 27 (0) 86 541 1173
Cell: 27 (0) 83 231 6538

5th September 2019

Dear OA Kehinde,

Thank you for having submitted your abstract, **Doing it, and doing it rightly enough: A critical analysis of communication and mass media roles in development of social justice in Nigeria and South Africa**, for the University of Zululand's 10th Humanities and Social Sciences Conference.

Your submission has been accepted for presentation by an internal Conference Review Committee in the Faculty of Arts.

We look forward to seeing you at the Meet-Mekaar Resorts, Mtubatuba from the 23-25 October this year.

You are requested to attend to the Registration details found at this link:

http://www.arts.uzulu.ac.za/conference/index.php/registration

On behalf of the Organising Committee, allow me to extend our warmest regards.

Paul Stewart

UNIVERSITY OF ZULULAND

Paul Stewart (PhD)
Associate Professor
10th HSS Conference Programme Chair
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Postal Address: Private Bag X1001, KwaDlangezwa 3886
RESTRUCTURED FOR RELEVANCE

Council for the Development of Social Science Research in Africa
Conseil pour le développement de la recherche en sciences sociales en Afrique
مجلس تنمية بحوث العلوم الإجتماعية في أفريقيا
Conselho Para o Desenvolvimento da Pesquisa em Ciências Sociais em África
CODESRIA

Date: 3rd October 2019
Ref: TGF/CCOM/Inv. Laur/30/2019

Olumuyiwa Adekunle KEHINDE
University of Zululand
Department of English
KwaZulu-Natal, South Africa
Email : oakenny247@gmail.com

Dear Olumuyiwa Adekunle KEHINDE,

RE: Invitation to the CODESRIA 2019 College of Academic Mentors Institute.

On behalf of CODESRIA, I am pleased to invite you to participate in the CODESRIA 2019 College of Academic Mentors Institute, to be held from October 21st to November 1st, 2019 in Nairobi, Kenya.

You will be accommodated at Kenya School of Monetary Studies, Mathare North Road, off Thika Road, Nairobi, where the sessions of the Institute will also take place. The costs of your participation including your travel, accommodation (bed and breakfast) and staying costs in Nairobi will be met by CODESRIA.

The African studies Association of Africa will also be organizing their 2019 conference in Nairobi from the 24th -26th October 2019. We are making plans for your registration such that you attend the conference as well as part of this academic process.

An information note on the organization of the institute will be sent to you soon. Kindly note that you will receive by email the institute documents that you are requested to save carefully in your laptop or flash disk; no hard copy will be provided. You are therefore urged to travel with these materials.

Looking forward to welcoming you in Nairobi.

Yours sincerely,

Ibrahim Oanda Ogachi
Head of Training, Grants & Fellowships Programme
CODESRIA - Tel : +221 33 825 98 20
Email : ibrahim.oanda@codesria.org

Av. Cheikh Anta Diop x Canal IV, P.O. Box 3304, Dakar, 18524, Senegal
Tel: +221 33 825 98 22/23 • 33 864 01 36/37/38 • Fax: +221 33 824 12 89
E-mail: codesria@codesria.sn • Web Site: http://www.codesria.org

AFRICAN STUDIES ASSOCIATION OF AFRICA
Email: info@as-aa.org | Phone: (233) 275334993 | Website: http://www.as-aa.org

AFRICAN STUDIES ASSOCIATION OF AFRICA (ASAA)
3RD Biennial Conference
United States International University-Africa, Nairobi, Kenya
24-26 October 2019
http://as-aa.org/index.php/asaa-2019-conference/

09th October 2019

Invitation Letter for Mr. Olumuyiwa Adekunle Kehinde (Nigerian Passport, Number A50469808)

Dear Mr.Adekunle

The African Studies Association of Africa (ASAA), in collaboration with the United States International University-Africa, is pleased to invite you to participate in the ASAA Third Biennial Conference under the theme: '**African and Africana Knowledges: Past Representations, Current Discourses, Future Communities**'. Your participation at the conference will be part of your doctoral mentorship institute which will run alongside the conference from 21-31 October 2019. The conference will hold for the first time in East Africa at the United States International University-Africa, Nairobi, Kenya. Your abstract has been accepted and placed on the provisional conference programme.

All expenses related to your attendance will be borne by your sponsor CODESRIA, including air travel, accommodation, meals and visa costs. If you have any questions, you may contact Ms. Titilope Ajayi by email to conference@as-aa.org

We greatly welcome and appreciate your participation in this conference and look forward to welcoming you to Nairobi in October.

With warm best wishes,

Titilope Ajayi, ASAA Executive Assistant
On behalf of the Scientific Committee