



Ministry of Higher Education and Scientific Research  
Mustapha Ben Boulaid University of Batna 02  
Faculty of Letters and Foreign Languages  
English Language and Literature Department



## **A Pragmatic Analysis of Autistic Children:**

**Case of Dar El Amal Wa Tadhamon- Batna**

**Thesis Submitted to the Faculty of Letters and Foreign Languages  
for the Requirements of the Degree of 'Doctorat Sciences' in  
Applied Linguistics**

**Candidate: Mrs. Amina RABEHI**

**Supervisor: Pr. Nadir KAOULI**

### **Board of Examiners**

<b>Chairperson:</b>	Pr. Amor GHOUAR	Mustapha BENBOULAID University
<b>Supervisor:</b>	Pr. Nadir KAOULI	Mustapha BENBOULAID University
<b>External Examiner:</b>	Pr. Nacif LAABED	Constantine 01 University
<b>Internal Examiner:</b>	Dr. Mohammed KHENCHALI	Mustapha BENBOULAID University
<b>External Examiner:</b>	Dr. Amel Gamra LALAOUNA	Batna 01 University
<b>External Examiner:</b>	Dr. Soumia HADDAOUI	Setif 02 University

**October 2023**

## **Dedication**

For my Mother, "my Iron woman and my universe." My Father, "my crown of logic and my King." For my Husband, to whom I will be eternally grateful for having him always through tough times; for my Brother, Sisters, and Aunt "Koukou", whose love, encouragement, and prayers made it possible for me to get such success. My loved ones who have always supported me and been so proud of me. Throughout my many years in school, they have always shown me love and encouragement. I count myself really fortunate to have them in my life. I dedicate my effort.

## **Acknowledgements**

After praising God for empowering me to trust myself and pursue my ambitions, I desire to express my appreciation to my thesis supervisor, Pr. KAOULI Nadir, for his insightful feedback, endless patience, and inspiring words of wisdom. Countless lessons and insights into the working of academic research have been gleaned from his technical and editorial help, which were crucial to the completion of this research. Simply said, I will be forever grateful to him for having faith in me and always encouraging me to do my best.

Furthermore, I would like to express my sincere appreciation to the esteemed members of the board of examiners; Pr. Amor GHOUAR, Pr. Nacif LAABED, Dr. Mohammed KHENCHALI, Dr. Amel Gamra LALAOUNA, and Dr. Soumia HADDAOUI who spent time reading my work and offering insightful feedback and suggestions for improvement, thank you!

Finally, I owe a great deal to the warmth and generosity of the staff at the "Dar el Amel wa Tadhamon Center," where I had an unforgettable experience.

## **Declaration**

I, Amina RABEHI, hereby certify that my PhD thesis entitled "**A Pragmatic Analysis of Autistic Children: Case of Dar El Amal Wa Tadhamon- Batna**" is a presentation of my original research work. It has not been submitted in substance for any other degree or award at this or any other university or place of learning, nor is being submitted concurrently in candidature for any degree or other award.

All the material presented for examination is my own work; and wherever contributions of others from the published or unpublished work of another person in any quotation or paraphrase are involved, they have been duly acknowledged with due reference to the literature which I present for examination.

This work was done under the guidance of Professor Nadir. KAOULI, at the English Language and Literature Department, Mostafa BENBOULAIID University.

**December, 2022**

Signature of Candidate

**Mrs. Amina RABEHI**

## **Abstract**

Disruption of normal developmental phases may lead to a weakening of cognitive abilities, which can have serious repercussions for socialisation. Autism Spectrum Disorder is characterized by enduring challenges with social interaction and engagement, as well as restricted and repetitive patterns of behavior. These features are widely recognized as hallmarks of the disorder. It often emerges in the first few years of a person's life (American Psychiatric Association, 2013). Autism is displayed by unconventional social communication and interaction. Therefore, it is not astonishing that autistic people have severe pragmatic difficulties. In this respect, the primary goals of this study are to make a generalization about the universality of pragmatic development of autistic children as well as the developmental connection between pragmatic aspects and language in general, focusing on Algerian-speaking autistic children. It also portrays the way age, gender, school attendance, and Mean Length of Utterance influence such pragmatic parameters. It clarifies how schooling contributes to the development of communicative and pragmatic abilities in a 'longitudinal instrumental case study'. The data gathered depended on Pragmatic Protocol designed by Prutting and Kirchner (1987); sampling and observation of spontaneous language that took around eight months and been analysed quantitatively and qualitatively to address the research questions. The findings show that participants performed poorly on tests of communication. Also, the pragmatic difficulties associated with autism stem from cognitive rather than cultural factors. It was shown that schooling and increased Mean Length of Utterance help autistic children become better at using a variety of pragmatic skills. In addition to this, there is a significant correlation between the Mean Length of Utterance of a child and their likelihood of enrolling in formal education. Participants with a consistent school attendance pattern had better Mean Length of Utterance scores.

**Keywords:** Autism Spectrum Disorder, age, gender, school attendance, MLU, communicative abilities, Pragmatic Protocol, cognitive factors, cultural factors.

## **List of Acronyms**

**1H-MRS:** 1H-Magnetic Resonance Spectroscopy

**AAC:** Augmentative/Alternative Communication

**ACE:** Assessment of Comprehension and Expression

**ADHD:** Attention-Deficit Hyperactivity Disorder

**ADI-R:** Autism Diagnostic Interview-Revised

**ADOS:** Autism Diagnostic Observation Schedule

**ADOS-G:** Autism Diagnostic Observation Schedule-Generic

**ALICC:** Assessment of Language Impaired Children's Conversations

**ANOVA:** Analysis of Variance

**APA:** American Psychiatric Association

**AQ:** Autism Spectrum Quotient

**AS:** Asperger Syndrome

**ASD:** Autism Spectrum Disorder

**CCC:** Children's Communication Checklist

**CNS:** Central Nervous System

**DM:** Developmental Model

**DSM-V:** Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition

**DSM-IV:** Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition

**EF:** Executive Functioning

**ERP:** Potentials Related to Events

**FBA:** Functional Behavioral Assessment

**FC:** Facilitated Communication

**fMRI:** Functional Magnetic Resonance Imaging.

**GABA:**  $\gamma$ -Amino-Butyric Acid

**GI:** Gastro-Intestinal

**HFA:** High-Functioning Autism

**ICD:** International Classification of Diseases

**IQ:** Intelligence Quotient

**LI:** Language Impairment

**LIST:** Listening Skills Test

**LUI:** Language Use Inventory

**M1:** Primary Motor

**MLU:** Mean Length of Utterance

**NIDCD:** National Institute on Deafness and other Communication Disorders

**PC:** Personal Computer

**PDD-NOS:** Pervasive Developmental Disorder-Not Otherwise Specified

**PECS:** Picture Exchange Communication System

**PI:** Pragmatic Impairment

**PL:** Pragmatic Language

**PLI:** Pragmatic Language Impairment

**RRBs:** Restrictive Repetitive Behaviors

**SCD:** Social (Pragmatic) Communication Disorder

**SDQ:** Strengths and Difficulties Questionnaire

**SES:** Socio-Economic Status

**SGD:** Speech-Generating Devices

**SIL:** Summer Institute of Linguistics

**SLI:** Specific Language Impairment

**SMA:** Supplementary Motor Area

**SPD:** Semantic-Pragmatic Disorder

**SVF:** Semantic Verbal Fluency

**TD:** Typically Developing

**TLC:** Test of Language Competence

**ToM:** Theory of Mind

**ToPL:** Test of Pragmatic Language

**TVAs:** Temporal Voice Areas

**UK:** United Kingdom

**UNCRC:** United Nations Convention on the Rights of the Child

**V:** Variance

**VF:** Verbal Fluency

**VMA:** Verbal Mental Age

**WHO:** World Health Organization

**WWC:** Weak Central Coherence

## List of Tables

<b>Table 1</b> Formal Tests with Pragmatic Content, (Adams, 2002) .....	125
<b>Table 2</b> Common Pragmatic Checklists and Related Evaluations, (Adams, 2002) .....	127
<b>Table 3</b> Systematic Coding for the Evaluation of Social Interaction .....	129
<b>Table 4</b> Related Measures of Pragmatics Comprehension, (Adams, 2002).....	131
<b>Table 5</b> Rules of Pearson Correlation Coefficient (r) adapted from Turney (2022) .....	150
<b>Table 6</b> Age Distribution of Participants .....	152
<b>Table 7</b> Gender Distribution of Participants .....	152
<b>Table 8</b> Distribution of Participants according to Attending School.....	152
<b>Table 9</b> Mean Length Utterance for each Participant. ....	153
<b>Table 10</b> Recommended a Priori Sample Size for Different Research Designs .....	155
<b>Table 11</b> Profiles of Autistic Children Participants .....	156
<b>Table 12</b> Performance on the pragmatic parameters as a whole .....	163
<b>Table 13</b> Occurrence of Verbal Pragmatic Parameters according to Prutting and Kirchner Protocol (1987).....	196
<b>Table 14</b> Occurrence of Paralinguistic Pragmatic Parameters according to Prutting and Kirchner Protocol (1987).....	198
<b>Table 15</b> Occurrence of Non-verbal Pragmatic Parameters according to Prutting and Kirchner Protocol (1987).....	199
<b>Table 16</b> Independent Samples T-Test Result Based on Age .....	202
<b>Table 17</b> Independent Samples T-Test Result Based on Gender .....	205
<b>Table 18</b> Independent Samples T-Test Result Based on School Attendance .....	211
<b>Table 19</b> Independent Samples T-Test Result Based on Mean Length of Utterance .....	214
<b>Table 20</b> The Pearson Correlation Coefficient between the Performance of Participants on the Pragmatic Parameters and Age, Gender, School Attendance, and MLU .....	222

## List of Figures

<i>Figure 1</i> Autism prevalence per 10,000 from 2012 to 2021 .....	23
<i>Figure 2</i> Clinical Features of Autism Spectrum Disorder (adapted from Grabrucker 2021) ..	26
<i>Figure 3</i> Elements of pragmatics (adapted from Perkins 2010).....	82
<i>Figure 4</i> A Classification Scheme for PI and Underlying Causes (Adapted from Perkins 2010) .....	83
<i>Figure 5</i> The Affective Theory according to Hobson (1987) .....	87
<i>Figure 6</i> The Cognitive -Meta Representation Theory.....	94
<i>Figure 1.</i> Steps in the Process of Conducting a Mixed-Method Study (Adapted from Cannon, 2004).....	121

## Table of Contents

Dedication .....	i
Acknowledgements.....	ii
Declaration .....	iii
Abstract .....	iv
List of Acronyms .....	v
List of Tables.....	viii
List of Figures.....	ix
Table of Contents.....	x

### General Introduction

General Introduction .....	2
1. Statement of the Problem.....	6
2. Research Questions .....	6
3. Research Hypotheses.....	7
4. Significance of the Study.....	7
5. Limitations of the Study .....	8
6. Organization of the Study .....	9

### Chapter One

#### Theoretical Background of Autism Spectrum Disorder

Introduction .....	13
1.1 Definition of Autism Spectrum Disorder and Historical Background .....	13
1.2 Etiology.....	17
1.3 Spread of Autism around the World.....	21
1.4 Clinical Features.....	24
1.5 Diagnosis Process.....	30
1.5.1 Pre-Diagnosis.....	30
1.5.2 During Diagnosis .....	31
1.5.3 Post Diagnosis.....	32
1.5.4 Obtaining a Second Opinion.....	32
1.5.5 Support Groups and Counseling .....	32
1.6 Differential Diagnostics .....	33
1.7 Characteristics Associated with Autism .....	34
1.7.1 Cognitive and Neurological Characteristics .....	35
1.7.1.1 Theory of Mind (ToM) .....	35

1.7.1.2 The Theory of Executive Function .....	36
1.7.1.3 The Theory of Weak Central Coherence (WCC) .....	37
1.7.2 Behavioral Characteristics .....	37
1.7.2.1 Atypical Eating and Abnormal Sleep Patterns .....	37
1.7.2.2 Self-Injurious Behavior, Aggression, and Temper Tantrums .....	38
1.7.2.3 Restrictive Repetitive Behaviors (RRBs).....	38
1.7.3 Communication Characteristics .....	39
1.7.3.3 Pragmatics .....	39
1.7.3.1 Taking Speech Literally .....	39
1.7.3.2 Prosody.....	39
1.7.4 Social Characteristics .....	40
1.7.5 Sensory Characteristics .....	40
1.7.5.1 The Seven Senses Affected by Autism .....	40
1.7.5.2 Three Types of Sensitivity .....	41
1.7.5.3 Addressing and Treating Sensory Impairments .....	42
1.8 Gender Differences in Individuals with Autism .....	42
1.9 Pathology of Autism Spectrum Disorder .....	46
1.9.1 Neuropathology.....	46
1.9.2 Extracerebral pathology.....	47
1.10 Speech, Language, And Communication Skills .....	49
1.10.1 Articulation and Prosody .....	50
1.10.2 Semantics .....	51
1.10.3 Syntax .....	53
1.10.4 Pragmatics.....	54
1.11 Interventions.....	56
1.12 Autism in Algeria .....	59
1.12.1 Autism Challenges in Algeria.....	61
1.12.2 Algerian research on autism .....	62
Conclusion .....	62

## **Chapter Two**

### **Autism Spectrum Disorder in Relation to Pragmatics**

Introduction.....	63
2.1 Pragmatics Definition .....	63
2.2 Pragmatics and Normal Development .....	70

2.3 Developmental Pragmatics in Children’s Language Development.....	71
2.3.1 The Anticipated Milestones for Developmental Pragmatics .....	72
2.3.2 Research Viewpoints on Developmental Pragmatics.....	73
2.3.3 Learning Environments Through Conversation .....	74
2.3.4 The Emergence and Development of Pragmatic Skills.....	75
2.3.4.1 Speech Acts Development in Young Children.....	75
2.3.4.2 Conversational Skills of Children.....	75
2.3.4.3 Social and Politeness Parameters of Language Use .....	78
2.4 Pragmatics and Impairment .....	80
2.4.1 Autism and Deficits in Pragmatics.....	83
2.5 Theories in Pragmatics Deficits .....	86
2.5.1 The Affective Theory .....	86
2.5.2 The Meta-Representation Theory .....	90
2.6 Factors Affecting Pragmatic Development.....	96
2.6.1 Cultural Differences .....	96
2.6.2 Socio-economic Status (SES).....	97
2.6.3 Effects of Parents and Context.....	97
2.6.4 Age .....	98
2.6.5 Gender .....	98
2.6.6 MLU .....	99
2.7 Pragmatic Competence is of Utmost Importance.....	100
2.8 Previous Research on Pragmatic Impairment in Autism Spectrum Disorder.....	101
Conclusion .....	107

### **Chapter Three**

#### **Research Methodology and Procedures**

Introduction.....	110
3.1 Research Design and Methodology.....	110
3.1.1 Case Study/ Longitudinal Study .....	111
3.1.1.1 Definition of case study .....	112
3.1.1.2 Design of case study .....	113
3.1.1.3 Category of case study .....	115
3.1.1.4 Longitudinal Case Study .....	117
3.1.1.5 Advantages of case study .....	118
3.1.3 Research Method.....	119

3.1.3.1 Quantitative Method of Research .....	122
3.1.3.2 Qualitative Method of Research .....	122
3.1.4 Research Tools and Instrumentation .....	123
3.1.4.1 Published Language Pragmatics Tests .....	124
3.1.4.2 Published Checklists or Profiles .....	126
3.1.4.3 Coding System of Naturalistic Assessment of Interaction.....	127
3.1.4.4 Assessment of Language Pragmatics Comprehension .....	131
3.1.5 Selecting an Evaluation Method .....	132
3.1.5.1 The Pragmatic Protocol by Prutting and Kirchner (1982) .....	133
3.1.5.1.1 Communicative Parameters Assessed Using the Pragmatic Protocol: Definitions .....	136
3.1.5.2 Language Sampling .....	143
3.1.5.2.1 Forms of Language Sampling .....	143
3.1.5.2.1.1 Free Play .....	144
3.1.5.2.1.2 Conversation .....	144
3.1.5.2.1.3 Narrative .....	145
3.1.5.3 Participants Observation.....	145
3.1.6 Statistical Instruments for Data Analysis .....	148
3.1.6.1 Frequency Distribution .....	148
3.1.6.2 Percentage Distribution.....	148
3.1.6.3 Mean .....	149
3.1.6.4 Standard Deviations .....	149
3.1.6.5 T-Test.....	149
3.1.6.6 F-Test .....	149
3.1.6.6 Pearson correlation Coefficients.....	150
3.1.7 Study Variables .....	151
3.1.7.1 Dependent Variables:.....	151
3.1.7.2 Independent Variables: .....	151
3.2 Population and Sample Description .....	153
3.2.1 Population Definition .....	153
3.2.2 Sample Definition .....	153
3.2.3 The eligibility criteria of the Sample.....	154
3.2.4 The Sampling Procedure .....	154
3.2.5 Sample Size for Case Study.....	155

3.2.6 Profiles of Autistic Children Participants.....	156
3.3 Data Collection Procedures.....	157
3.3.1 Steps Followed for Data Collection .....	158
Conclusion .....	158

## **Chapter Four**

### **Data Analysis and Interpretation**

Introduction.....	160
4.1 Children's Performance on the pragmatic parameters as a whole .....	162
4.1.1 Always Appropriate Pragmatic Parameters.....	164
4.1.2 Sometimes Appropriate Pragmatic Parameters .....	164
4.1.3 Absent Pragmatic Parameters .....	165
4.2 Analysis of the Performance of each Parameter .....	165
4.2.1 Speech Act Analysis (Variety/Pair) .....	165
4.2.2 Topic Selection, Introduction, Maintenance, and Change .....	167
4.2.3 Turn Taking .....	170
4.2.3.1 Conversational Initiation/Response .....	170
4.2.3.2 Conversational Repair/Revision .....	172
4.2.3.3 Pause Time .....	173
4.2.3.4 Interruptions/ Overlaps .....	175
4.2.3.5 Feedback to Speakers.....	176
4.2.3.6 Adjacency.....	176
4.2.3.7 Contingency.....	178
4.2.3.8 Quantity/Conciseness.....	178
4.2.4 Lexical Selection/Use across Speech Acts .....	179
4.2.4.1 Specificity/Accuracy .....	179
4.2.4.2 Cohesion.....	180
4.2.5 Stylistic Variations .....	181
4.2.5.1 The Varying of Communicative Styles.....	181
4.2.6 Intelligibility and Prosodics .....	183
4.2.6.1 Intelligibility .....	183
4.2.6.2 Vocal Intensity/Vocal Quality and Prosody .....	184
4.2.6.3 Fluency .....	186
4.2.7 Kinesics and Proxemics.....	189
4.2.7.1 Physical proximity, Contacts, and Body Posture .....	189

4.2.7.2 Foot/Leg - Hand/Arm Movement .....	191
4.2.7.3 Gestures and Facial Expressions .....	192
4.2.7.4 Eye Gaze .....	193
4.3 Pragmatic Skills Distribution according to Prutting and Kirchner Protocol (1987) .	196
4.3.1 The Verbal Aspects .....	196
4.3.2 The Paralinguistic Aspects .....	198
4.3.3 The Nonverbal Aspects .....	198
4.4 The Impact of Age, Gender, Education, and Mean Length of Utterance on Pragmatic Development in Autistic Children.....	200
4.4.1 The Pragmatic Aspects Associated with Age .....	200
4.4.2 The Pragmatic Aspects Associated with Gender .....	205
4.4.3 The Pragmatic Aspects Associated with School Attendance .....	209
4.4.4 The Pragmatic Aspects Associated with Mean Length of Utterance (MLU).....	214
4.5 Performance of Children on Pragmatic Aspects and Corresponding MLU .....	221
General Conclusion.....	224
References .....	231
Appendices	
Abstract (Arabic)	
Abstract (French)	

## **General Introduction**

1. Statement of the Problem.....	6
2. Research Questions.....	6
3. Research Hypotheses .....	7
4. Significance of the Study .....	7
5. Limitations of the Study.....	8
6. Organization of the Study .....	9

## **General Introduction**

Since at least the time of Aristotle, language's intricacy has been regarded as distinctly human. Ethologists have enhanced overall understanding of the way other mammals like chimpanzees, dolphins, gorillas, etc. use sound to communicate in complex manners, whereas human beings depend on verbal as well as non-verbal forms of interaction to an unprecedented degree in their daily lives (Eibl-Eibesfeldt, 1989). The enigmatic nature of this capacity is thought to remain unresolved and unexplained, despite the critical role that language plays in human civilization. Even when researchers do provide insight, it is with the understanding that language is only a means by which people convey not just facts and figures, but also concepts, emotions, and even thoughts.

The capacity to interact with one another is what is meant by language. It encompasses not just verbal and written communications but also the use of visual aids like signs, gestures, and even facial expressions. Language encompasses all means of communicating via the symbolic representation of one's ideas and emotions in order to transmit meaning to others, including the spoken speech which is the highly efficient and extensively utilised type of communication. One definition of language is that it is a set of symbols utilised in communication. Although individuals use language to interact with one another, they may also internalise it and "have a conversation" with ourselves Sapir (1921). The way our thoughts are framed and our lives are interpreted is shaped by the language we use.

Humans have been communicating with their environments since before they first cried. Babies express themselves verbally and non-verbally; this includes crying and cooing or pointing and other gestures respectively. In contrast, a significant developmental stage emerges when newborns start to use language to talk, usually between the ages of 08-18 months. When a youngster states "table," we know that they are referring to a table, since the word is a symbolic representation. The capacity of an infant to comprehend and use language begins

with their first sobs. It grows as the youngsters become older. Because of their profound impact on their children's education, parents should keep a close eye on these changes at all times. Providing a positive role model is one way to encourage learning and academic success in young people. Parents have a substantial influence on their children's academic achievements as well as they should always work to help their kids reach their fullest potential.

Syntax, Phonology, Semantics, as well as Pragmatics are the four foundations upon which the study of language rests. Phonology is considered to be the study of a language sounds. Syntax refers to the rules that govern how words are ordered and modified (as an illustration, cook becomes cooked when referring to the past) to ensure that they make sense to the target audience. Simplified, semantics is the study of how words are used. The study of pragmatics focuses on the application of language. It is likely that the language use varies depending on the audience, whether it is a professor, a group of friends, or a toddler. To put it another way, people are using a variety of linguistic strategies. Each of these four domains is fostered in youngsters as they learn to speak verbally (Gleason, 2005). They have to be able to recognise and imitate the sound of a language children are learning. Learning the meanings of words and how to string them together to make sense is only the first step; students also need to know how and when to employ language to suit the needs of their audiences and advance their aims.

Syntax, Phonology, and Semantics were major areas of inquiry in the study of language. Nevertheless, there has been a significant change in emphasis during the last thirty years. More and more scholars across academic fields are investigating the pragmatics of language. They looked at how early toddlers acquire the linguistic proficiency required for expressing their wants, needs, thoughts, and feelings. Different academic disciplines, including linguistics, psychology, sociology, as well as medicine, have all aided in our knowledge of how pragmatic language skills are acquired. Ervin Tripp & Susan (2012), Clark (2004), Ninio and Snow

(1999), Carpenter (1988), Naremore (1985), Creaghead (1984), and Bates (1976) are only a few of the sources that support this idea.

Two of the most crucial skills that infants and toddlers need to develop are the ones involving language: understanding and using it (Hoff, 2006; Hart & Risley, 1992). Infants' interactions with several people, things, and events in their daily environments provide the groundwork for and foster the development of a vast array of critical skills (Greenwood et al., 1991; Carta & Greenwood, 1987). A child's early language development might benefit from consistent exposure to spoken language. Household and the wide variety of other ambient noises that newborns are exposed to are the closest and most important of these sources.

A youngster who can employ language to manage emotions as well as act in an acceptable social setting is most likely to create positive relationships with peers and to make new friends (Im-Bolter & Cohen, 2007). Nevertheless, particular language impairment is identified as the language development of a child cannot adhere to a typical developmental pattern without any apparent cause. The challenges in characterising the unique features of distinct profile of impairments have been brought to light as researchers grow more interested in more exact classification of children with communication impairments. Children with semantic-pragmatic disorder (SPD) conversational disability (Conti-Ramsden & Gunn, 1986), (Bishop & Rosenbloom, 1987), pragmatic disability (McTear & Conti-Ramsden, 1992), and pragmatic language impairment (PLI) are a subgroup that has been the subject of much discussion and research (Bishop, 1998).

Concerns have been raised about whether or not children with this kind of disability constitute a distinct clinical population (Gagnon et al., 1997; Brook & Bowler, 1992). Clinical observations of kids with primary pragmatic language impairments reveal that they may have seemingly typical language development on the surface, and though struggle with turn taking, using pragmatic cues in conversation, and understanding complex language (Attwood,

1998; McTear & Conti-Ramsden, 1992; Bishop & Rosenbloom, 1987; Rapin & Allen, 1987). Based on this, there is debate about whether or not they should be labelled as having anything other than Asperger syndrome or High Functioning Autism (Gagnon et al., 1997).

According to research (Meilijson, 1999), as a syndrome, autism may occur with varying degrees of severity. There are various challenges associated with defining and classifying autism due to the heterogeneity of the autism population. The possibility of a spectrum of autistic disorders, including autism and its many possible variants, whose symptoms appear in varying degrees of severity is becoming more widely acknowledged today. Because autism is caused by a lifelong brain defect, it is present from birth and cannot be cured.

Autism research has predominantly concentrated on the social, affective, and communicative deficiencies exhibited by autistic individuals. It is proposed to tackle the issue of autism from the vantage point of linguistic pragmatics, since it is widely held that this is where the disorder's fundamental deficit resides. Earlier research on syntax, phonology, and semantics yielded contradictory findings. Recently, pragmatics has taken centre stage in studies, and it is now widely understood that Autistic people have problems in this area (Rapin, 1991).

As a result, the first chapter provides a theoretical framework for understanding autism spectrum disorder, as a major goal of the current study is examining pragmatic language development in children diagnosed with it. It includes basic definitions of several key concepts pertinent to the study. It defines the notion of Autism Spectrum Disorder (ASD), concentrating on etiology and pathogenesis, spread, theories, viewpoints, throughout the World as a whole and Algeria in particular. The present study aims to give a pragmatic analysis of autistic children in Algeria via the lens of psycholinguistics. As such, the second chapter includes an explanation of several notions connected to Pragmatics, its significance, and theories, as well as an in-depth description of how ASD children usually struggle to acquire pragmatics'

principles and previous research of Pragmatic Impairment in ASD.

### **1. Statement of the Problem**

Research on early children's skill development has, for many years, mostly concentrated on typically developing youngsters. Rarely is research conducted on children with disabilities such as hearing loss, autism, or mental illness. In addition, it was discovered that European languages, particularly English, mirror the evolution of research into children's language. There exists a paucity of published academic literature pertaining to the field of pragmatic development of Arab children from a psycholinguistic perspective, according to a study of the relevant literature.

In spite of progress made in understanding how children acquire pragmatic skills, scholars have shown less interest in the topic of pragmatic language than they have in areas such as syntax, semantics, and phonology. Thus, it is anticipated that this study would pique the interest of investigators in this area, allowing us to get a deeper understanding of the trajectories of pragmatic language development, particularly as it pertains to a vulnerable group like autistic children.

### **2. Research Questions**

This investigation seeks to address the following questions related to children's development of communicative skills:

- Do children diagnosed with ASD exhibit proficient or deficient pragmatic communicative skills?
- How does a child's age, gender, mean length of utterance (MLU), as well as access to schooling have an impact on their pragmatic growth?
- Is there a measurable degree to which MLU relate positively with school attendance among Algerian Autistic children?

### **3. Research Hypotheses**

This research was designed around three hypotheses that could help shed light on these issues:

- It is hypothesised that autistic children in Algeria would exhibit suboptimal, i.e., inefficient, performance with respect to their pragmatic communication skills.
- It is hypothesised that the development of pragmatic communicative skills is not influenced by age.
- In contrast to ordinarily developing children, it is hypothesised that only school attendance influences MLU development in autistic children. Mean Length of Utterance is unaffected by age and gender. It is assumed that the more youngsters participate in various forms of social contact, the more they will develop and improve their language abilities.

### **4. Significance of the Study**

There have been many studies that contributed to the field of autism, yet the contribution was somewhat not fully accomplished. One aspect with regard to this disorder is not yet thoroughly explored is that of Pragmatics. Numerous academics have endeavored to investigate this matter; nevertheless, several of the inquiries have focused on the study of autism from a phonological, syntactic, or semantic perspective (Bates, 1976; Creaghead, 1984; Naremore, 1985; Carpenter & Strong, 1988; Ninio & Snow, 1999; Clarck, 2004; Ervin Tripp, 2012). Thus, the present investigation makes a scholarly contribution by offering a pragmatic examination of the aforementioned disorder. The following list of factors makes this research significant:

- Insights about autistic children's pragmatic development are provided, benefiting both parents and caregivers.
- It lends credence to or refutes several universal statements about children's pragmatic development and helps make generalization about autism in Algeria.

- Neurologists, pathologists, and psychologists may employ it to examine the similarities and differences between typically developing youngsters and the ones who have received a diagnosis of Language Impairment (LI). To be specific, Autistic Children.

## **5. Limitations of the Study**

Some limitations were placed on this work, including:

- To start with, the access and official authorization to work directly with autistic children were challenging. The author of the study faced many obstacles to have access to centers that deal with such sensitive population.
- As an additional note, the COVID-19 pandemic may have both immediate and far-reaching consequences depending on a variety of factors. Key elements, including gatherings that act as a focal point, are included. In the fields of education and research, face-to-face meetings are highly valued. Completing work from home and attending virtual meetings may be taxing. The researcher considers lack of public areas and slow internet are the biggest obstacles they face, leading to fewer planned meetings.
- There are only 30 communication skills that are studied in depth. This eliminates the inclusion of other facets of pragmatics, such the ability to narrate.
- Children from the age of 5 to 18 make up the study population. Consequently, adult and adolescent populations are excluded.
- The research only examines children who have been born and lived in Algeria; therefore, it does not take into account the effects of exposure to other cultures.
- Since this research focuses on pragmatic development in autistic children, it cannot include typical children or those with other impairments such as Down syndrome, traumatic brain injury in newborns, or right hemisphere impairment.
- This research examined worldwide publications from several Arab nations on diverse components of ASD. Nevertheless, the primary obstacle the researcher experienced was

the difficulties of gaining access to articles published in national journals of various Arab nations. This restricted our evaluation to just items published abroad.

## **6. Organization of the Study**

This study presents a comprehensive overview of four chapters, with the first chapter commencing with a literature review that provides an in-depth understanding of autism and its underlying theories. These theories serve as a foundation for analyzing the data. It encompasses basic definitions of several key concepts pertinent to the study. It defines the notion of ASD, concentrating on etiology and pathogenesis, spread, theories, viewpoints, throughout the World as a whole and Algeria in particular.

Chapter two provides an overview of the pragmatic field and explores the correlation between deficits in pragmatics and autism. It includes an explanation of several notions connected to Pragmatics, its significance, and theories, as well as an in-depth description of how ASD children usually struggle to acquire pragmatics' principles and previous research of Pragmatic Impairment in Autism Spectrum Disorder.

Chapter three, on the other hand, specifies the research design by describing the focus of this research. It highlights a comprehensive approach to the study in hand involving the research process, method, tools and instrumentations, as well as depicting the selection of different evaluation techniques in the study. Also, it represents data collection procedures by describing also data sampling process, together with the specific criteria involved in it. It illustrates the framework that guides data collection, and the data elicitation process adopted. Finally, it gives a demonstration of the statistical treatment selected to analyse the data and deals with the variables as well as data analysis procedure chosen in the present research.

Lastly, the fourth chapter assesses different pragmatic communicative skills development with regard to 13 verbal autistic children ranging from 5 to 18 years old using 30 indicators of the pragmatic protocol designed by Prutting and Kirchner in 1982 classified into three distinct

categories, namely verbal acts, paralinguistic elements, and non-verbal elements, with respect to age, gender, school attendance, and mean length of utterance (MLU). In addition to that, the chapter provides evidence about the correlation between MLU and age, gender, as well as attending school. It also presents the discussion of these findings.

## Chapter One

### Theoretical Background of Autism Spectrum Disorder

Introduction.....	13
1.1 Definition of Autism Spectrum Disorder and Historical Background .....	13
1.2 Etiology.....	17
1.3 Spread of Autism around the World.....	21
1.4 Clinical Features.....	24
1.5 Diagnosis Process.....	30
1.5.1 Pre-Diagnosis.....	30
1.5.2 During Diagnosis .....	31
1.5.3 Post Diagnosis.....	32
1.5.4 Obtaining a Second Opinion.....	32
1.5.5 Support Groups and Counseling .....	32
1.6 Differential Diagnostics .....	33
1.7 Characteristics Associated with Autism .....	34
1.7.1 Cognitive and Neurological Characteristics .....	35
1.7.1.1 Theory of Mind (ToM) .....	35
1.7.1.2 The Theory of Executive Function .....	36
1.7.1.3 The Theory of Weak Central Coherence (WCC) .....	37
1.7.2 Behavioral Characteristics .....	37
1.7.2.1 Atypical Eating and Abnormal Sleep Patterns .....	37
1.7.2.2 Self-Injurious Behavior, Aggression, and Temper Tantrums .....	38
1.7.2.3 Restrictive Repetitive Behaviors (RRBs).....	38
1.7.3 Communication Characteristics .....	39
1.7.3.3 Pragmatics .....	39
1.7.3.1 Taking Speech Literally .....	39
1.7.3.2 Prosody.....	39
1.7.4 Social Characteristics .....	40
1.7.5 Sensory Characteristics .....	40
1.7.5.1 The Seven Senses Affected by Autism.....	40
1.7.5.2 Three Types of Sensitivity .....	41
1.7.5.3 Addressing and Treating Sensory Impairments .....	42
1.8 Gender Differences in Individuals with Autism .....	42

1.9 Pathology of Autism Spectrum Disorder .....	46
1.9.1 Neuropathology.....	46
1.9.2 Extracerebral pathology.....	47
1.10 Speech, Language, And Communication Skills .....	49
1.10.1 Articulation and Prosody .....	50
1.10.2 Semantics .....	51
1.10.3 Syntax .....	53
1.10.4 Pragmatics.....	54
1.11 Interventions.....	56
1.12 Autism in Algeria .....	59
1.12.1 Autism Challenges in Algeria.....	61
1.12.2 Algerian research on autism .....	62
Conclusion .....	62

## **Chapter One**

### **Theoretical Background of Autism Spectrum Disorder**

#### **Introduction**

The field of child psychology is a well-known subset of the broader umbrella term of psychology. Research on children's behaviour and development from infancy through adolescence is known as child psychology. The current chapter encompasses basic definitions of several key concepts pertinent to the study. It defines the notion of ASD, concentrating on etiology and pathogenesis, spread, theories, viewpoints, throughout the World as a whole and Algeria in particular. The current investigation, which is psycholinguistic, seeks to provide a pragmatic analysis of autistic children in Algeria. Thus, the coming sections display literature pertaining to the disorder.

#### **1.1 Autism Spectrum Disorder Definition and Historical Background**

Autism is said to be a rare neuro-development disorder of genetic origin. Although, it is discovered nowadays that there is no one cause of autism. Research points out that autism develops from genetic and non-genetic or environmental influences. Individuals having ASD struggle to comprehend and produce verbal or nonverbal parts of social communication stereotyped behaviours (Lord et al., 2018). It is characterised by social and communication difficulties, in addition to repetitive and restricted behaviours, the degree of which varies between individuals (Lord et al., 2018). Bruner (1975, 1983) and Vygotsky (1962) assert that the entire learning process, i.e., language learning, is shaped by social engagement, predominantly involving families (parents and their children). Language is regarded as a prominent diagnosis as well prognostic factor in this disorder. Despite the theoretical perspective or etiology, language matters are essential in describing Autism Spectrum Disorder, ranging from a complete absence of verbal communication to meticulous speech. The former is distinguished by a diverse array of observable indications (Miilher & Fernandes, 2009).

People with autism often look emotionless and incapable of forming emotional bonds with others. In addition, they frequently exhibit peculiar reactions to sensory or receptive experiences. Every one of these symptoms ranges from moderate to severe. Autism has acquired relevance in the field of study due to its rapid growth; for instance, according to 2018 figures, the prevalence of autism in Algeria has been reported to be 500,000 individuals.

According to Baron-Cohen, Frith, and Leslie (1985), autism in a child is considered as severe developmental disorder as well an unusual diagnosis. This disorder impacts the language and communication skills of youngsters. Autism is characterized by a high prevalence of linguistic delay and dysfunction (p. 37). Furthermore, social interaction issues as well deficiency in “theory of mind” impact communication abilities.

Autism Spectrum Disorder (ASD) is defined by the federal legislation known as the "Individuals with Disabilities Education Act" in the United States as follows: “A child is classified as having autism when the child has a developmental disability that significantly affects verbal and nonverbal communication and social interaction, that is generally evident before age three, and that adversely affects educational performance.” (Code of Federal Regulations 1308/1308, 15)

Williams (1994, p.234), an autistic, provides a remarkable account of her own autism experience and assessment of other individuals with autism she has interacted with. The author has asserted in her exemplary literary work:

Autism is just an information processing problem that controls who I appear to be. Autism tries to stop me from being free to be myself. Autism tries to rob me of my life, of friendship, of caring, of sharing, of showing interest, of using my intelligence, of being affected ... it tries to bury me alive.

Moreover, Ritvo and Freeman (1977, p.146) delineated ASD as a recurring impairment. Regarding this matter, they have expressed:

Autism is a severely incapacitating life-long developmental disability that typically appears during the first three years of life. It occurs in approximately five out of every 10,000 births and is four times more common in boys than girls. It has been found throughout the world in families of all racial, ethnic, and social backgrounds.

The etymology of the term 'autism' can be traced back to its Greek root 'autos,' which translates to 'self.' People suffering from autism and Asperger Syndrome have significant trouble comprehending and respecting other people's ideas, views, and perspectives, as though their own perspective is the only true and proper one (Baron-Cohen, 2008, p.16). The term "autos" was first utilized by Paul Eugen Bleuler, a psychiatrist from Switzerland. However, Kanner's and Bleuler's definitions of 'autism' differ slightly. In 1943, Leo Kanner, a child psychologist, introduced the term "Classic Autism". He used the phrase to describe the clinical condition of the youngsters; however, Bleuler used the term expressly to refer to adolescents and adults with autism (Blake, Hoyme and Crotwell, 2013, p.58-59).

#### **Classic Autism by Leo Kanner also Referred to as Kanner's Autism**

Blake et al. (2013) suggested that Kanner released a clinical report titled "Autistic Disturbance of Affective Contact" in 1943, in which he investigated a number of autistic youngsters. He identified eleven (11) children at his Baltimore clinic. These people exhibited what he termed "autistic aloneness." They have showed so little interest in individuals who can be regarded as office furniture. They have similar patterns of behavior, interests, or language delay/disorder. The youngsters have been tremendously autistic and distant. They chose to remain alone and refused to contact their parents and caregivers (p.58-59). Baron-Cohen (2008) observed challenges in the ability to predict the emotional and cognitive states of others, as well as in determining appropriate responses to their actions. In addition, they had trouble interpreting others' emotional displays (anger, grief, happiness, etc.) and accepting that there

may be alternative opinions to their own. They tended to employ incorrect language in social settings and could only comprehend the literal meaning of words. Among the several language problems, they are characterized by language delay; some children did not speak until the age of three. Some of them exhibited improper intonation, echolalic speech, improper use of personal pronouns, and misuse sentence construction. Classic autism is more likely to have echolalic speech, low Intelligence Quotient (IQ) or learning problems, and language delay than Asperger syndrome (p.17-19).

### **The work of Bruno Bettelheim entitled Parentectomy**

He regarded autistic youngsters in 1960's as inhabiting an inaccessible "glass of bubble." He views autism as a consequence of a "cold mother attachment". His contentious viewpoint resulted in a procedure known as "parentectomy." It refers to the practice of separating a child from his or her parents in the expectation that the child's social development may restore and prosper under the care of more affectionate foster parents. However, his ideas and methods generated much criticism. Upon the discovery that removing a child from their biological parents did not yield significant benefits for their social development, this practice lost popularity. It is commonly held that parents of autistic children exhibit comparable levels of empathy and fondness as parents of neurotypical children (Baron-Cohen, 2008; Blake et al., 2013).

### **Holding Therapy by Niko Tinbergen**

In his book published by 1983, Nobel Prize-winning ethologist Niko Tinbergen confirmed Bettelheim's theory, claiming that a trauma disturbed the child's main bond to the mother. Long automobile drives, even for a brief separation, can trigger autism in children, particularly nervous ones. Numerous autistic youngsters exhibited a significant level of anxiety, but there was no evidence to back his claim that autism was caused by a traumatic event. In addition, he created a controversial therapy known as "Holding Therapy." This latter consists

of physically hugging the youngster to break the child's aversion to being held, touched, or embraced.

### **Hans Asperger's Asperger Syndrome**

It has been ethically questioned due to the fact that forcing youngsters into such social engagement can be extremely distressing (Baron-Cohen, 2008, p.20-21). In 1944, an Austrian pediatrician named Hans Asperger identified a distinct subtype of autistic children. Blake et al. (2013) highlighted Kanner's autistic youngsters in contrast to Asperger's Asperger Syndrome. Asperger's notions were first exposed to the English-speaking community in 1981, when Lora Wing published a study in *Psychological Medicine*. HFA, or High-Functioning Autism, is commonly referred to as Asperger syndrome since individuals with HFA are considered cognitively "higher functioning" than other autistic individuals "IQ > 70" (p.59). Other features of children with AS or HFA and autism include a desire for solitude, a distaste of playing with others, and difficulties interacting with others. Unlike other autistic children, AS children have no language delay, an advanced vocabulary, and an IQ in the average range or higher. This is the most significant distinction. While these children are able to use accurate grammar and understand figurative language, such as irony, humor, sarcasm, etc., they are unable to interpret figurative language. Other autistic children (such as those with Classic autism) may have similar difficulties with non-literal sequence comprehension, social interaction, and a confined and repetitive pattern of behavior (Baron-Cohen, 2008, p.22-23).

### **1.2 Etiology**

In the pursuit of understanding the etiology of autism, it has become imperative to acknowledge the extensive body of prior research that has established a significant genetic influence on the disorder. Studies in the field of behavioral genetics have revealed that there exists a significant correlation between ASD diagnosis in siblings. Specifically, children who have siblings diagnosed with ASD have a considerably higher likelihood of being diagnosed

with ASD themselves. The concordance rates for ASD diagnosis among monozygotic twins have been reported to be as high as 70% (Folstein & Rosen-Sheidley, 2001). In many instances, parents and close relatives of autistic people might even display autistic-like symptoms and behavioural patterns, although not meeting the criteria for diagnosis (Howlin, 2006). According to Happe, Ronald, and Plomin (2006), such results indicate that genetic predisposition may contribute in the genesis of autism, although it is unlikely to be the sole cause. The role of particular genes in the etiology of autism remains uncertain. However, research indicates that numerous genes may be involved and that the genes involved may differ from individual to another (Persico & Bourgeron, 2006). A folic acid shortage at the time of conception (Egorova et al, 2020), the presence of gestational diabetes (Aviel-Shekler et al., 2020), and the use of some antidepressants during pregnancy (Morales, Slattery, Evans, & Kurz, 2018) may also be associated with autism in the children; however, there is no solid evidence linking these risks. Therefore, genetic and environmental factors, such as exposure to viruses and Teratogens during early pregnancy, are likely to interact and lead to the development of ASD (Landigran, 2010). Researchers agree that parenting and other social variables (such as bonding) will not impact an individual's risk of developing autism spectrum disorder (ASD), despite the fact that these variables are likely to have a substantial influence on the development, adaptation, and functioning of children and adolescents (Bernier & Gerdts, 2014; Field & Hoffman, 1999).

Recent developments in neuroscience research have revealed that ASD individuals exhibit anomalies in terms of their structural, functional, and connectivity characteristics; however, the relevance of such abnormalities in the development of ASD remains unclear. Accelerated brain volume growth throughout childhood is one of the findings that have contributed the most to the knowledge of structural variances. This research indicates that between the ages of Two and Four, the Grey and White matter of the brain increase by around ten percent (10%). Several investigations have suggested the possibility of a population plateau

subsequent to a phase of rapid expansion, despite inconclusive data (Amaral, Schumann Nordahl, 2008). In addition, a lack of agreement exists within the scholarly literature regarding the specific brain regions that may demonstrate volume anomalies among researchers. Early investigations indicate that the Amygdala and Cerebellum are relevant areas (Piven, Arndt, Bailey, & Andreasen, 1996; Sparks et al., 2002). Nevertheless, the replication of these findings has proven to be challenging. The aforementioned matter has been associated with the utilization of limited datasets and a substantial degree of age variation among the individuals participating in the study (Lord & Jones, 2012). Autism may be related to variations anomalies in the Ventricles, Corpus Callosum, and potentially other smaller Cortical areas, as according recent empirical research on larger participant samples (Haar, Berman, Behrmann, & Dinstein, 2014).

Additionally, substantial changes in activation patterns have been noticed in autistic individuals in comparison to those without the disorder. Prior research has primarily concentrated on activation during social cognition-related activities, such as face processing, perspective-taking, and imitation. A comprehensive review of this literature can be found in Anagnostou and Taylor's (2011) work. One of the most commonly drawn inferences is that there exists a disruption in the activation and operation of the "social brain" network, which is designed to handle social information and sentiments. Rarely, abnormalities in the Prefrontal Cortex activity, which is the main brain region accountable for executive function, have been detected in specific tasks that require executive control (Agam, Barton, Joseph, & Manoach, 2010; Silk et al., 2006). Similar activities have been observed to elicit atypical neural responses, albeit with reduced magnitude, in regions of the brain implicated in language processing, auditory perception, and motor control (Harris et al., 2006).

Several postmortem investigations of the brains of ASD patients revealed indications of disturbed neural connections. Nonetheless, these investigations had several shortcomings,

including small sample numbers and imprecise clinical diagnosis. In addition, they frequently neglected to assess the influence of characteristics such as intellectual disability, language and age (Schultz & Robins, 2005). The hypothesis that individuals with autism spectrum disorder (ASD) exhibit distinctive connectivity patterns in their brains compared to typically developing individuals is supported by neuroimaging investigations of connection strength and quantity. Noonan, Haist, and Müller (2009) have reported a reduction in functional connectivity within cortical regions, accompanied by a heightened and widespread connectivity pattern. The present findings have led to the formulation of a hypothesis suggesting that individuals with autism spectrum disorder might exhibit atypical neural connectivity in contrast to those who are neurotypical. Nevertheless, the available evidence in support of this claim is currently limited (Maximo, Cadena, & Kana, 2014).

Until far, researchers have been unable to make definitive conclusions on the exact brain areas impacted or the mechanism of development that results in observable abnormalities in brain structure due to a lack of data, methodological obstacles, and conflicting findings. Additional studies propose that the issue pertains to the connectivity patterns both within and between various regions of the brain (Courchesne and Pierce, 2005).

The existence of a connection between autism spectrum disease and childhood vaccinations is one of the most contentious issues in the field. Despite significant investigation, no credible studies have demonstrated a correlation between autism spectrum condition and any vaccinations. In reality, the original study that sparked the discussion years ago has been withdrawn due to its flawed design and dubious research techniques.

There is no generally approved medical therapy for autism yet because of the lack of agreement on what causes it.

### **1.3 Spread of Autism around the World**

Autism Spectrum Disorder (ASD) is presently estimated to afflict over 40 million children globally, making it one of the most prevalent neurodevelopmental diseases in childhood (World Health Organisation, 2013). Epidemiological research shows an obvious increase in prevalence rates over the world for the past fifty years, despite the wide variation in prevalence estimates among studies and nations (Christensen et al., 2016; Elsabbagh et al., 2012; Kim et al., 2011; Magnusson & Saemundsen, 2001; Wing & Potter, 2002).

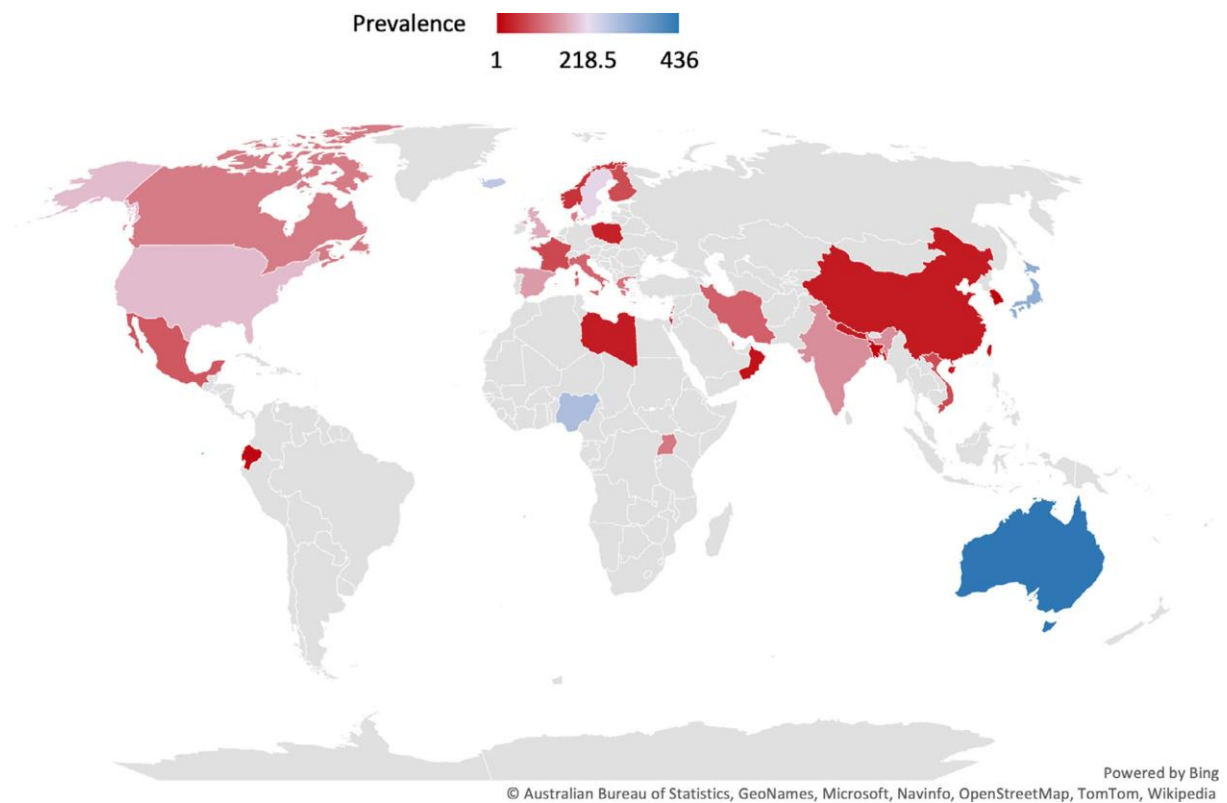
Until 2013, global estimates of the disorder's prevalence, presently categorised as ASDs, have been accessible. For autistic disorder, researchers calculated a prevalence of 17/10,000 (about 1 in 588) and a prevalence of 62/10,000 (approximately 1 in 161) in a 2012 survey that analysed prevalence data from different areas of the world (excluding sub-Saharan Africa) (Elsabbagh et al., 2012).

Autism spectrum disorder (ASD) is estimated to affect approximately one in 160 individuals in Sub-Saharan Africa, India, and the Caribbean. The lack of population-based surveys in sub-Saharan Africa has resulted in a dearth of information regarding the prevalence and impact of autism in the region. However, certain countries in the region do have data (mainly from hospital-based research) available (Ababakar, Ssewanyana, & Newton, 2016; Franz et al., 2017; Elsabbagh et al., 2012; Newton & Chugani, 2012). India had no community-based autism population research until recently, although there were still a few studies undertaken in health facilities on autism clinical evaluation. The Hindi version of the Indian Scale for Assessment of Autism indicated an incidence of 0.15 % (1 in 667) with a male sex preference in a 2017 population-based study (of 28, 078 children between the ages 1 to 10 years, encompassing rural, urban, and tribal areas in India) (Karla, Seth, & Sapra, 2005; Malhi & Singhi, 2014). In the Caribbean islands, the Aruba Autism Project studied the incidence of ASDs in Aruba between 1990 and 1999 and found that 53/10,000 children were diagnosed with

the disorder (Van Balkom et al., 2009)

Obliquely, epidemiological research is increasingly utilised to draw conclusions regarding the etiological elements associated with autism. By instance, a rise in prevalence across time is interpreted as a consequence of a shift caused by environmental risk factors. Likewise, variance in prevalence which is due to important socio-demographic characteristics (e.g., economic, social, ethnic, or geographic) is considered to be indicating real heterogeneity in biology and environmental etiology (e.g., Hewitt et al., 2016). In contrast, opposing ideas have attributed these relationships to health inequalities, whereby stigma/structural impediments contribute to the exclusion of ethnic or socio-economic minorities, alter accessibility to services, thus cause a variance in predominance (e.g., Durkin et al., 2017; Elsabbagh, 2020).

Several investigations have explored the worldwide occurrence of autism. In 2012, a thorough examination of worldwide prevalence revealed that the median occurrence of autism was 62 per 10,000 children, with a consistently greater frequency observed in males (Elsabbagh et al., 2012). Significant discrepancies were noted in the estimations both inter and intra geographically, as well many portions of the world, such as Africa and Eastern Europe, lacked estimates altogether. In addition, estimates were mostly accessible for youngsters, as relatively few research included populations older than 18 years. Similar to this study, the majority of research was done in Northern Europe and the United States, although there are more studies from previously underrepresented locations, such as Middle East and Africa (al-Mamari et al., 2019; Alshaban et al., 2019; Chinawa et al., 2016).



**Figure 2.** Autism prevalence per 10,000 from 2012 to 2021

Recently, the international community has experienced a dramatic grow in autism awareness and public health response. One of the benefits is a huge improvement in the on-time diagnosis, which partially explains the increasing incidence rates observed over the years. Simultaneously, there has been a rise in epidemiological projections on a global scale, particularly in formerly under-represented countries like Middle East and Africa (al-Mamari et al., 2019; Alshaban et al., 2019; Chinawa et al., 2016 Research of this nature contribute to the advancement of the worldwide public health response. Contemporary studies persist in demonstrating the comparatively elevated occurrence of autism, along with its consequential impacts on both physical well-being and financial stability.

In response to the requirement for an updated worldwide assessment of ASD prevalence, recent studies found a median prevalence of 65/10,000 compared to 62/10,000 in prior reviews. Present-day research findings indicate an upward trend in the evaluated prevalence rates, observed either at the national level or among specific sub-populations. For instance, studies

conducted by Lai et al. (2012) and Chen et al. (2019) have reported an increase in prevalence rates in Taiwan. Similarly, Christensen et al. (2019) and Jariwala-Parikh et al. (2019) have documented a 600-percent rise in the United States during the preceding twenty-year period. Hong et al. (2020) have also reported an increase in prevalence rates in South Korea. Studies conducted by van Bakel et al. (2015) in France and Randall et al. (2016), May et al. (2017), and May et al. (2020) in Australia have reported an increase in the assessed prevalence of certain conditions in successive birth cohorts.

The longitudinal patterns in the occurrence of autism reflect the combined influence of multiple factors, rather than a singular etiological pathway. The rise in prevalence of autism can be attributed to various factors such as heightened awareness in the community and public health response on a global scale, changes in case definitions that have broadened diagnostic limits over time, rise in the diagnosis of less severe forms, and an escalation in autism examination in communities that were previously under-diagnosed, characterised by gender, location, and race or ethnicity. The notion that regional differences or changes over time in the prevalence of a certain condition may indicate differences in contact to external risk factors (Nevison, 2014) or increasing migration patterns is currently supported by limited or conflicting evidence (Keen et al., 2010).

Numerous new research being conducted in previously under-represented areas provide exciting possibilities to understand the etiology of autism while also increasing the community's ability to meet unmet needs, particularly for those in underserved populations.

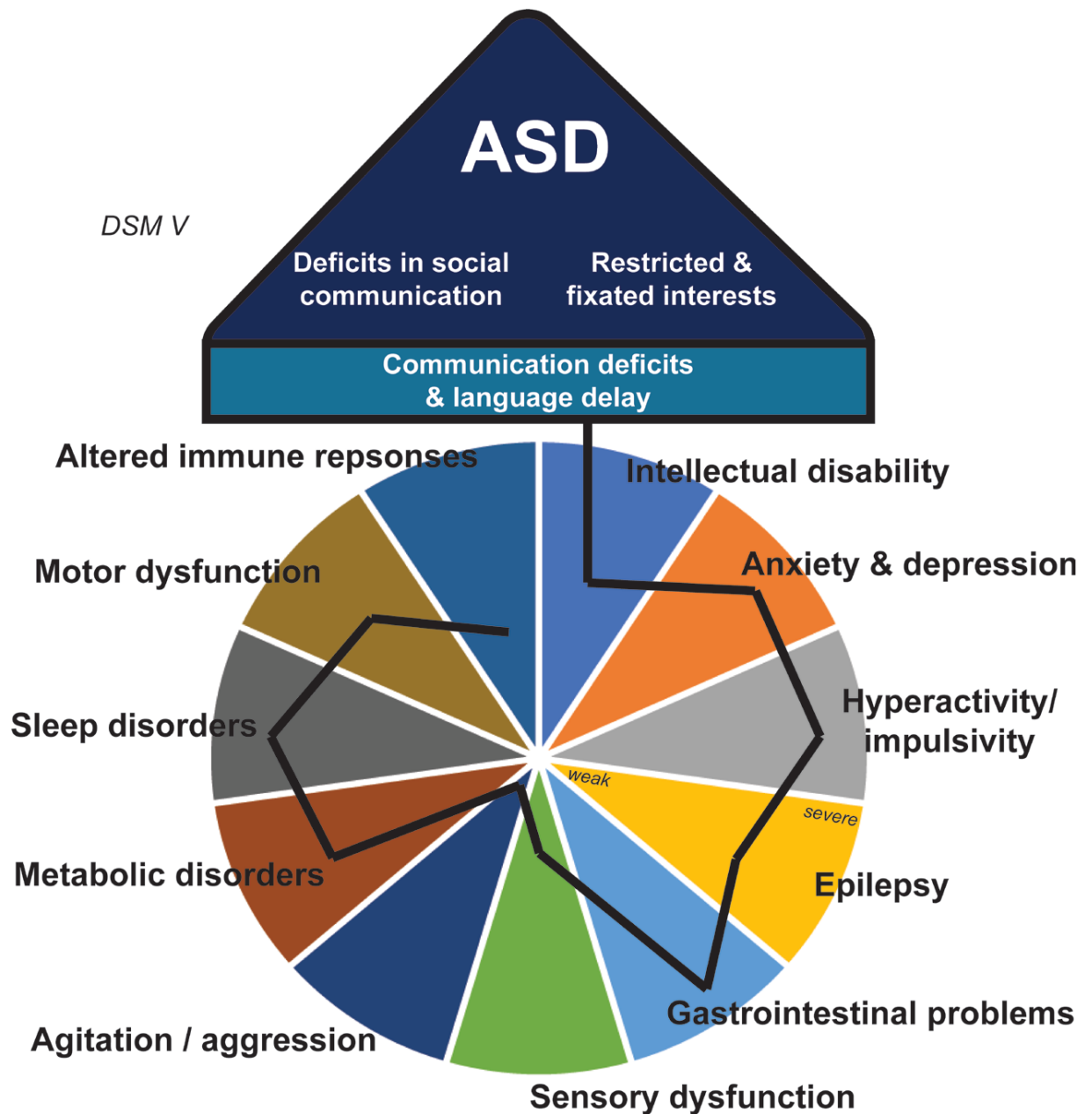
#### **1.4 Clinical Features**

Sensitivity or unusualness in responding to taste, touch, smell, or sight stimulus is a prevalent trait among those with ASD. An autistic person may have a time-delayed response to learning but excel at other areas to an extraordinary degree. One child with the disorder may have significant physical and cognitive disabilities, whereas the other child may be very talented

in science, art, mathematics, and memory, but may lack social skills. The inability to manage emotions, reactions, and behaviours is another characteristic. They could be more sensitive, or they may have an expressionless face and look dispassionate.

Due to the wide range of symptoms associated with ASD, compiling a comprehensive listing of the most common clinical issues can be challenging. The limited understanding of the deficits that are more commonly observed in individuals with higher levels of functioning can be attributed to the predominant focus of past research on the clinical challenges associated with lower-performing children. Despite this, there are commonly cited social characteristics associated with autism. These include challenges in establishing and maintaining significant social relationships, such as close friendships, as well as tendencies for violating social norms as well as engaging in behaviours that are perceived as socially inappropriate. Additionally, individuals with autism may struggle with accurately interpreting nonverbal cues and making and maintaining direct eye contact, as well as participating in conversations and small talk. (Nazeer & Ghaziuddin, 2012; Volkmar, Rogers, Paul, & Pelphrey, 2014).

Non-social symptoms of ASD may manifest as a strong inclination to adhere to routines, such as consistently taking the same route or eating the same types of food. Additionally, individuals with ASD may develop obsessive-compulsive preferences for specific subjects, such as dates, cars, or astronomy. They may also exhibit a preoccupation with structural system and order, with some individuals reporting a greater sense of comfort while their daily activities follow a schedule (Dodd, 2015; Hollander, Kolevzon, & Coyle, 2011).



**Figure 3.** Clinical Features of Autism Spectrum Disorder (adapted from Grabrucker 2021)

Autism expresses itself in a variety of ways; nonetheless, the following behavioral signs might be noticed (Choque Olsson et al., 2016):

- An autistic will always attempt to distance himself from the others surrounding him.
- An autistic will never have a discussion with youngsters his age, and if he does make friends, he will have trouble maintaining them.

- Autistic individuals present difficulty in interpreting the emotional conditions and feelings of those around them.
- The autistic youngster may have difficulty comprehending facial features, gesture, and distinct voice tones. In addition, a symptom of autism is that affected individuals do not concentrate their efforts on the faces of others and, as a result, are unable to recognize and develop acceptable behavioral patterns.
- Autistic individuals struggle with both verbal and nonverbal communication. Some people are incapable of developing any form of language.
- Additional indication of autism in children seems that they really do rarely share enough with their parents, do not seek comfort from them, do not display emotional response, and do not spend much time with others.
- An autistic youngster refers to himself in the third person, through his own name, rather than in the first person with "my" or "me". This indicates an inability to recognize oneself.
- The conduct of the autistic child is of the extreme significance since he will tend to engage in repetitive, routine-based activities and typically exhibits a limited repertoire of behaviors. Without playing voluntarily and freely, where they express their creativity, they could repeatedly line all the toys over and over again, for instance (Choque Olsson et al., 2016).

It may be observed that its behavior is quite variable; it is also highly sensitive to specific sounds and prone to bouts of hyperactivity. It is crucial for parents to understand what routines their child prefers to follow, and if they decide to adjust or change these patterns, it is best not to do so abruptly, since this might result in an outburst of desperation or fury (Croen et al., 2015).

According to the Classifications of Mental Illnesses ICD-10 and DSM-IV (World Health

Organization, 1993), the three primary symptoms are:

1) An infringement on social bonds:

- Failure to establish relationships with peers (strong lack of interest in peers, lack of friendship).
- Not sharing one's emotions with others (they do not share feelings with others).
- Absence of social-emotional bonding with others (inappropriate behavior in social situations, lack of emotional responses, such as comfort, looks as if they are using others as objects).

2) Speech and language impairments:

- Speech is nonexistent or unintelligible to others.
- Absence of compensatory mimicry or gestures for verbal speaking; absence of spontaneously imitation of others' actions.
- Stereotypical, repeated behaviors and echolalia, the verbalization of thoughts (thinking out loud).

3) A repetitious repertoire of stereotypical acts and interests:

- Unusual, stereotypical acts or narrowly focused special interests (fixed observation of moving objects, rituals).
- Routine and repeated behaviors (bouncing, rocking on a chair, rotation of the fingers in front of the eyes).
- Obsession with pieces of objects or non-functional characteristics of objects (such as doll eyes or wheelchairs) or extraordinary attention in sensory aspects: fixation to a specific touch, scent, or flavor.

Although all the reported overlaps, a number of red flags may suggest that the youngster is at threat of developing autism:

## *A PRAGMATIC ANALYSIS OF AUTISTIC CHILDREN*

At the age of six (06) months:

- It is observed that there are minimal or absent pleasant, warm, and attractive facial expressions such as smiles, and limited/no eye contact.

At the age of nine (09) months:

- The communication of smiles, sounds, or other facial expressions is minimal or absent.

By one year:

- There is a lack of babbling or minimal babbling present.
- Few/no reciprocal movements such as displaying, pointing, waving, or reaching.
- Almost no responsiveness to name.

Within 16 months:

- Quite few words or none.

Within 24 months:

- There are few or no significant two-word sentences (not including repeating or imitating)

At any age:

- Loss of acquired social skills, babbles, or language.
- Avoiding eye contact.
- Consistent preference of isolation.
- Difficulty comprehending the emotions of others.
- Language development delay.
- Repetition of the same words or phrases (echolalia).
- Resistance to modest alterations in routine or environment.
- Limited interests.

- Repeated actions (spinning, flapping, rocking, etc.)
- Atypical and exaggerated reactions to sensory stimuli such as smells, auditory cues, flavors, tactile sensations, colors, and/or luminous emissions.

## **1.5 Diagnosis Process**

Due to autism's vast range of symptoms and severity levels, it is uncommon for a single physician to give a diagnosis. Frequently, experts must collaborate and exchange views and notes.

### **1.5.1 Pre-Diagnosis**

When discussing ASD diagnosis, physicians' resort to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) to assess whether or not a child matches the criteria-based diagnostic for a diagnosis within the spectrum (American Psychiatric Association; 1994). The diagnostic criteria for ASD have been broadened to include less severe forms of the disorder. The most recent criteria in the corresponding technical report can be obtained from the DSM-IV (APA; 1994) or the DSM for Primary Care; Child and Adolescent Version (Academy edition). It may be difficult to apply these criteria to children younger than three years old, as they were created for children three years and older.

Every well-child visit should include a formal evaluation of the child's developmental progress. Developmental monitoring is an important job of the pediatrician within the setting of the medical home (Clinical Pediatrics 33.5, 1994) and should cover emotional and social criteria in addition to language, motor, and cognitive ones.

During the appointment, parents may answer a predefined developmental questionnaire or an objective screening instrument (Clinical Pediatrics 33.5, 1994). Parents are urged to report objective and subjective information to aid with clinical observations and milestone reporting. Additional concerns will compel the pediatrician to provide a more comprehensive screening test and to implement innovative interventions.

### **1.5.2 During Diagnosis**

To detect autism at an early age, a two-step approach must be followed. The first is about a comprehensive review of the child's development by a pediatrician. If this screening reveals any developmental concerns, then the youngster must undergo a second checkup (Fairthorne et al., 2016).

The second phase is a considerably more in-depth review conducted by health professionals with experience in a variety of specializations. During this stage, it is possible for the individual to receive autism diagnosis or another development-related disorder. It is generally feasible to accurately diagnose autism in a child by the age of two, even though it has been suggested that specific assessments for the detection of this disorder be performed as early as 18 months after birth (Broder Fingert et al., 2018). According to diagnostic categories of psychiatric disorders, autism symptoms must appear before the age of three, however early identification is challenging due to the non-specific nature of signs during the first two years (Rosen, Lord & Volkmar, 2021).

As with the majority of mental disorder diagnoses, a multifaceted and multimodal approach is required. The standard procedure for diagnosing autism involves the utilization of the Autism Diagnostic Interview-Revised (ADI-R) (Lord, Rutter, & Le Couteur, 1994) as well as the Autism Diagnostic Observation Schedule (ADOS) (Lord et al., 2000).

Parental and nursing inquiries, neurological examinations (epilepsy can accompany autism in certain children with the disorder, for example), as well as speech and communication, intelligence tests, motor function development, and perceptual functions collect further data. For exact differential diagnosis, multidimensional diagnosis is essential on the one hand to additional relevant and deficits and, consequently, to provide more effective action (Fitzgerald & Corvin, 2001).

### **1.5.3 Post Diagnosis**

A child may receive a diagnosis of Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS) if they meet certain diagnostic criteria but not all of them. Once a diagnosis of ASD has been established, the family and caregivers should be given current literature and information about parent support groups, websites, specialized autism intervention programs, and other community services.

### **1.5.4 Obtaining a Second Opinion**

Systematic/rigorous treatment and support are the most effective means of addressing the symptoms of autism. Regarding the new diagnosis, one might or might not desire to seek a second opinion. Developing treatment strategies for the child's linguistic and social issues should be a top focus if someone believes the diagnosis is accurate. Alternatively, treatment should be included for seeking a second opinion.

### **1.5.5 Support Groups and Counseling**

Support groups for parents are created so that they have someone with whom they may connect. It is already difficult to deal with the reality that your child has autism, but the support group provides parents with an avenue for providing relief (American Psychiatric Association, 2000). It may also involve counseling and the acquisition of knowledge through group sessions.

Parents frequently join these organizations and learn from their peers on what to expect, the best doctors in town, what activities to enroll their child in, and any other autism programs available for children. Families may also seek genetic counseling pertinent to the etiologic diagnosis of a family member. Parents of a youngster with an obviously isolated ASD should be informed about the higher likelihood of recurrence in subsequent children (3%-7%). (American Psychiatric Association, 2000). As soon as appropriate, counseling must be required to guarantee that the family obtains the correct direction, resources, and answers.

## **1.6 Differential Diagnostics**

Autism Spectrum Disorders encompass numerous more disorders. It is relatively simple to distinguish autism from several other generalized developmental disorders, like Rett Syndrome and disintegrative developmental disorder (Faras, Ateeqi, & Tidmarsh, 2010).

The distinction between Asperger and High-Functioning Autism is problematic (Fitzgerald & Colvin, 2001): individual investigations indicate that the development of speech is normal in Asperger though not in High-Functioning Autism. In addition, verbal abilities are still more developed in Asperger than nonverbal abilities. In reality, there is no clinical technique to distinguish between High Functioning Autism and Asperger's Syndrome, as opposed to Low-Functioning Autism (below 70 on the intelligence scale) in the same families share the same symptoms (Szatmari, Jones, Zwaigenbaum & McLean, 1998). As per reports, Asperger's Syndrome and High-Functioning Autism are considered to be equivalent conditions in regards to typical intellectual functioning. Asperger's diagnosis is preferable to autism disorder due to the negative connotation of the term autistic disorder (Joseph, Tager-Flusberg, & Lord, 2002).

Childhood Schizophrenia is difficult to manage. Child schizophrenia typically begins abruptly, and a period of normal development can be identified prior to the commencement of the disorder, whereas autism is more stable. Additionally, schizophrenia exhibits a positive symptom that is lacking in autism: delusions and hallucinations. Another distinguishing characteristic relates to non-verbal communication, which is absent or hindered in autism but within normal ranges in schizophrenia (Volkmar, 1998). Medications used to treat schizophrenia may exacerbate the symptoms of stereotyped recurring behaviors, making the management of schizophrenia crucial. Kanner's view of autism as a schizophrenic disorder (he refers to autism as "infantile schizophrenia") is irrelevant: investigations indicate that autism and schizophrenia are unrelated (Fombonne, 2003a). In the current diagnostic classifications, autism has been taken from the group of "schizophrenia spectrum disorders" and established as

a distinct generalized developmental disorder. In some instances, however, a pediatric dual diagnosis of autism and schizophrenia is conceivable (Jokiranta et al., 2013).

Autism spectrum disorder is frequently evident at a young age, commonly by age one. Symptoms might be observed between the ages of few months and three. The onset, or time during which the disorder is identified, typically occurs before the child's third year. A person with autism spectrum disorder might belong to any culture, race, economic or social group. Both sexes are involved, however males are diagnosed more frequently than females. A person with ASD may also have deafness, blindness, attention deficit disorder, cognitive difficulties, Cerebral Palsy, Down Syndrome, Epilepsy, etc. Given the dynamic nature of ASD, specialists assert that no two autistic children are alike.

The manifestation of ASD symptoms exhibits significant variability among individuals. Prior to the latest edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), individuals could receive diagnoses falling under three categories, namely childhood disintegrative disorder, Asperger's syndrome, and pervasive developmental disorder not otherwise specified (PDD-NOS). Since specialists cannot agree on the differences between these subtypes and because of the large overlap, ASD has been adopted as a single diagnostic designation (Ozonoff, 2012). The exclusion of Asperger's syndrome as a potential diagnosis has generated criticism within professional and patient communities. Individuals who have been pre-diagnosed with Asperger's syndrome, in contrast to other subtypes of autism, are required to possess an average or above average level of linguistic and intellectual ability, as well as exhibit fewer symptoms. Because of this, they were viewed as more socially competent than other autistic individuals (Klin, McPartland, & Volkmar, 2005).

### **1.7 Characteristics Associated with Autism**

Despite the fact that each person with ASD is a unique person with unique talents and abilities, this population has some characteristics. There are cognitive and neurological,

behavioral, communicative, social, and sensory features. The degree, intensity, and amount of the traits will vary depending on the individual.

### **1.7.1 Cognitive and Neurological Characteristics**

The present state of the development of children with autism is being impacted by three cognitive theories, namely the Theory of Mind (ToM), Theory of Weak Central Coherence (WWC), and Theory of Executive Function. Although data describing the cognitive characteristics of ASD are contradictory, it is assumed that abnormalities in cognitive functioning are expressed in the behavioral symptoms of autistic individuals (Best et al., 2008; Brunsdon et al., 2015; and Pellicano, 2010).

#### **1.7.1.1 Theory of Mind (ToM)**

It is defined by Pellicano (2010, p. 1) as “is caused by a specific inability to impute mental states to oneself and to others” (as cited by Baron-Cohen, Leslie, & Frith, 1985). Autism is, simply put, the inability of autistic individuals to understand the viewpoints of others. Individuals may perform less effectively in playing pretend, emotional comprehension, and perspective-taking (Merrill, 2015).

According to Premack and Woodruff (1978., p.515 as cited in Baron-Cohen et al., 1985., p.39), the theory is defined as:

In saying that an individual has a theory of mind, we mean that the individual imputes mental states to himself and others [...] A system of inferences of this kind is properly viewed as a theory, first because such states are not directly observable, and second, because the system can be used to make predictions, specifically about the behaviour of other organisms.

It is a cognitive, "mind-reading" skill, or capacity that all individuals possess to develop a good understanding of the environment in which people live. Each person's knowledge, thoughts, desires, and beliefs constitute their own distinctive theory of

mind. The possession of a theory of mind entails the ability to engage in introspection and consider the cognitive states of oneself and others (Belkadi, 2006).

### **1.7.1.2 The Theory of Executive Function**

Carlson and Moses (2001) have posited that the Theory of Executive Function pertains to an individual's capacity to regulate and manage their cognitive processes and behaviors. Executive function refers to the capacity to regulate and manage one's cognitive and behavioral processes (Carlson and Moses, 2001., p. 1032). This pertains to the ability to disengage one's cognitive faculties from the current context and circumstances, and instead utilize internal models or conceptual frameworks to guide one's actions. The executive role encompasses various tasks such as strategic planning, efficient organization, regular monitoring of progress towards objectives, and adaptability in addressing challenges (Bogdashina, 2006). In contrary to Theory of Mind (ToM), the concept of executive function lacks a cohesive definition. Thus, a conventional delineation of executive function encompasses the subsequent inventory of cognitive aptitudes:

The key elements of executive function include (a) anticipation and deployment of attention; (b) impulse control and self-regulation; (c) initiation of activity; (d) working memory; (e) mental flexibility and utilization of feedback; (f) planning ability and organization; and (g) selection of efficient problem-solving strategies.

(Anderson, 2008., p. 04)

The Theory of Executive Dysfunction states that “the symptoms of autism are a result of a primary problem in planning and execution of complex actions” (Pellicano, 2010, p. 1, as cited in Hughes & Russell, 1993; Ozonoff, Pennington, & Rogers, 1991). People with ASD experience trouble with abstract concept-based complex tasks such as reasoning and planning. They might also have difficulty preparing for the upcoming or following multistep instructions

(Merrill, 2015).

### **1.7.1.3 The Theory of Weak Central Coherence (WCC)**

The Weak Central Coherence theory varies markedly from both the Theory of Mind and other recent autism theories. It is the capacity to concentrate on both parts and wholes (Happé & Frith, 2006).

It states that “inherent to autism is an unusual tendency to focus on individual, local elements rather than global wholes” (Pellicano, 2010, p. 1, as cited in Frith, 1989; Happe & Frith, 2006). Individuals with autism may experience challenges in perceiving the holistic perspective, as well as in their reading comprehension, attention to detail, and adherence to literal interpretations (Merrill, 2015).

### **1.7.2 Behavioral Characteristics**

Individuals with autism have complex and unexpected behaviour patterns. Defining the purpose of certain problematic behaviors can be beneficial. Iovannone et al. (2003) discovered that "problem behaviors occurred for a purpose and that this purpose often involved a communicative intent" (p. 161). A functional behavioral assessment (FBA) can be performed to determine why a person exhibited problematic behaviors. This comprehension may facilitate the achievement of therapies that target replacement behaviors which provide same function similar to the specific behavioral problems (Iovannone et al., 2003).

#### **1.7.2.1 Atypical Eating and Abnormal Sleep Patterns**

Children with ASD exhibit atypical eating behavior. It presents as feeding issues including excessive food selection, meal rejection, and repetitive eating behavior. This may result in poor nutrition for some youngsters due to limited diets. Assumptions pertaining to unusual eating behavior include feeding struggles relate to sensory aversions, gastro-intestinal problems, or Restrictive Repetitive Behaviors (RRBs), such as concentration on sameness (Dominick et al., 2007).

Atypical sleeping habits and challenges, such as difficulty falling asleep and frequent awakenings, are higher among younger children diagnosed with ASD. Additionally, the amount and quality of sleep may be impacted (Dominick et al., 2007).

### **1.7.2.2 Self-Injurious Behavior, Aggression, and Temper Tantrums**

Temper tantrums, aggression, and Self-injurious behaviors in ASD children appear to be associated to deficiencies both for expressive and receptive communication skills, despite the lack of research in this particular field. Decreased levels of verbal skills are connected with higher rates of self-harm. The limited research suggests that "a diagnosis of autism is associated with a higher incidence of tantrums, aggression, and destruction of property" (Dominick et al., 2007, p. 147, as cited in Ando & Yoshimura, 1979a; McClintock et al., 2007). In analysis carried by Ando and Yoshimura (Dominick et al., 2007, as cited in Ando & Yoshimura, 1978, 1979a), the incidence of temper tantrums in ASD children was found to be significantly greater when compared to children diagnosed with mental retardation. Changes in routine or denial of a desired object are likely reasons of temper tantrums (Dominick et al., 2007).

### **1.7.2.3 Restrictive Repetitive Behaviors (RRBs)**

Lower-order behaviors, such as higher-order and sensory-motor behaviors, and higher-order behaviour such as limited or restricted behaviours, insistence on sameness, and cognitive rigidity, are established as subgroups of RRBs (Condy et al., 2019). According to Smith et al. (2019, para. 11), RRBs might exhibit the subsequent manifestations:

- Repetitive physical movements (flapping hands, spinning, swaying,) or constant movement.
- Compulsive fixation to strange stuff (keys, rubber bands, light switches)
- Obsession with a specific subject of interest, using numbers or symbols at times (license plates, maps, sports statistics)

- A great need for routines and order (follows a rigid schedule, lines up toys). Feels angry when the environment or routine changes
- Abnormal postures, clumsiness, or unusual movement patterns
- Captivated by rotational motion, moving elements, or toy components. For instance, spinning the wheels on a car toy, rather than playing with the toy itself
- Hypo- or hyper-reactivity to sensory stimulation. For instance, they react negatively to some noises or sensations and appears insensitive to pain and temperatures.

### **1.7.3 Communication Characteristics**

As among the basic symptoms of autism, language and communication impairments in the disorder range from certain persons never conversing to linguistic delays, persistent linguistic obstructions, pronoun inversion, and echolalia (Vicker, 2009). These problems are noticed in three aspects: literal interpretation, prosody, and pragmatics.

#### **1.7.3.3 Pragmatics**

The use of pragmatic communication is challenging for those with ASD. Pragmatic communication entails the capacity to "join a discussion, take turns managing the topics, make a comment to demonstrate understanding in the conversation, and graciously quit the interaction" (Vicker, 2009).

##### **1.7.3.1 Taking Speech Literally**

ASD persons also exhibit the communicative feature of literal interpretation of speech. They are found to struggle understanding sarcasm, puns, comedy, metaphors, and any other figure of speech that the youngest "normal" child immediately grasp" (Vicker, 2009).

##### **1.7.3.2 Prosody**

Prosody is a problem that people with ASD have while trying to convey their thoughts and feelings. "They may speak in a monotone, fail to put the rising inflection in their voice that usually comes at the end of questions, speak very slow or fast, and otherwise sound strange to

other people's ears. Just as they are not focused on others' body language, it is likely they may not clue into others' intonation patterns and so fail to copy or fully understand them" (Vicker, 2009).

#### **1.7.4 Social Characteristics**

A prevalent indication of ASD is the absence of social skill. Lack of ability to initiate or participate in social activities, inability to highlight the viewpoint of another person, improper behavior, lack of eye contact, non-functional language use, and a lack of communication gestures are all symptoms of this impairment (Syriopoulou-Delli et al., 2018). Individuals with ASD face additional social obstacles, such as the ones listed below:

- Considering others' feelings and intentions
- Acknowledging one's personal feelings.
- Using language to convey feelings
- Reaching out to others for emotional support
- Feeling unable to cope with social situations
- Engaging in turn-taking conversation
- Identifying one's own personal boundaries (appropriate distance) (Syriopoulou-Delli et al., 2018).

#### **1.7.5 Sensory Characteristics**

Sensory impairments in people with ASD can lead to difficulties with behavior and socialization because sensory perceptions are not processed and utilised as it should be. Biel (2013) have provided the following information about ASD's sensory characteristics.

##### **1.7.5.1 The Seven Senses Affected by Autism**

Autism affects the seven senses, including vision, touch, smell, taste, and hearing. This also includes the proprioceptive and vestibular senses. Individuals with autism are typically more sensitive to smell, touch, and taste.

**Vision.** Regarding vision, the focus component and the eyes' capacity to concentrate on a point are problematic for those with autism spectrum. This includes issues with contrast sensitivity, thus an individual with vision sensitivity may view a page and imagine the letters to be moving.

**Touch.** There are numerous types of touch that activate protective reactions. Individuals who are extremely sensitive toward a touch may experience temperature, vibration, and discomfort as a result of the defensive reaction.

**Hearing.** Audition is a passive, auditory process; however, actively listening is a process. Vestibular sense is considered to be the sense of movement. This is how a body recognizes deceleration and acceleration changes. The system handles information coming from inner ear receptors. It indicates which direction you are heading, which direction is upwards, where you are in space in reference to other objects, and how you consider moving in space in reference to objects. It improves muscle tone, balance, vision, and hearing.

**Proprioception.** Proprioception is considered to be the body consciousness generated by the muscles, connective tissue, and joints. It indicates the location of the body parts in space. Interoception permits one to comprehend the physiological state, thirst, hunger, bowel, heart rate, as well bladder needs.

#### **1.7.5.2 Three Types of Sensitivity**

**Hypersensitive.** The sensory input is too intense, and the individual is constantly on high alert and defense. With this type of activity, a person may easily become overloaded. Environment management is vital.

**Hyposensitive.** The sensory input is quietly arriving. The neurological system is subdued and lethargic. The individual who prefers to be disengaged and lethargic may energize themselves to become more engaged.

**Mixed Reactivity.** The individual may perform well at home and in a treatment setting,

however the presence of an overwhelming amount of sensory stimulation makes it impossible for them to pull themselves together. Due of the effort involved, it is not intuitive for them. Adding academic and social obligations and frequent changes might push someone to the breaking point.

### **1.7.5.3 Addressing and Treating Sensory Impairments**

It is critical to collaborate with a health care professional who possesses the necessary training as well as substantial experience evaluating and treating children who suffer from sensory processing disorders.

**Behavior Journal and Sensory Diet.** The key is to figure out what triggers it in the first place. What kinds of places, things, and people, are your child exposed to that may be causing his or her behavior? As soon as these stimuli have been recognized, the treatments will emerge as a natural consequence of this discovery. In the context of a sensory diet, pay attention to both relaxing and stimulating experiences. Specific sensory issues involve increased sensitivity to hearing, difficulty processing sound, and an overabundance of sound.

**Auditory Processing Tips.** The sensory component is crucial in ASD. Once you desire auditory attention or eye, one should touch shoulders in a forceful but not intimidating manner. You should position it at eye level with the individual. Use concrete words, not abstractions.

**Stems.** Neurological stems act as both a stress response and a copying technique. Stems, as a stimulating exercise, calm an overburdened nervous system and block out overwhelming sensory information.

## **1.8 Gender Differences in Individuals with Autism**

Autism Spectrum Disorder (ASD) exhibits a higher prevalence in males as compared to females, especially in individuals with a higher Intelligence Quotient (IQ) (Werling and Geschwind, 2013). According to the most recent research conducted by the Centers for Disease Control and Prevention in the United States, a prevalence rate of 01/38 among eight-year-old

males and 01/152 among eight-year-old females has been reported for Autism Spectrum Disorder (Baio et al., 2018). The survey revealed that, despite the commonly observed ratio of 4 to 1 in ASD prevalence between males and females, a greater proportion of males with ASD exhibited normal or higher than average IQ scores compared to females with autism. The gender disparity observed in the presentation of ASD suggests a potential bias towards males in the typical manifestation of the disorder (Kirkovski et al., 2013). The underrepresentation of female participants during the development of diagnostic instruments may result in a higher threshold for diagnosing autism in females, requiring them to exhibit an increased amount or severity of symptoms (Kreiser & White, 2014). In addition, female autistic participants exhibit a higher tendency towards engaging in "camouflage" (i.e., hiding the symptoms of autism) than male counterparts (Hull et al., 2017b). It clearly shows that ASD indications may be harder to identify in females; as a consequence, a significant percentage of females may receive an incorrect diagnosis, experience delayed detection, or remain undiagnosed altogether, resulting in inadequate access to therapy and support. As a result, it is crucial to understand possibly unique characteristics of autism among female individuals.

The disparity in reported rates potentially suggest a morphological distinction between male and female individuals with ASD. Studies examining differences in core autism clinical symptoms for different genders and co-occurring clinical symptoms have shown inconclusive results to date, with the bulk of studies concentrating on children and young adults. In an experiment analyzing 28 autistic European sets of adults and children (N = 2684), the researcher has discovered that females had reduced RRBs during the childhood than male population, Despite the absence of disparities in socio-communicative abilities, either during the developmental stage of early childhood or in the present time (Tillmann et al., 2018). In research of 499 autistic infants, however, females demonstrated greater deficit in communicating on the Autism Diagnostic Observation Schedule-Generic (ADOS-G; Lord et al., 2000), While male

individuals exhibited a more pronounced impairment in restricted and repetitive behaviors (RRB) (Hartley and Sikora, 2009). Several studies have demonstrated that men exhibit elevated levels of restricted and repetitive behaviors (RRBs) and decreased socio-communicative functioning (Mandy et al., 2012; Van Wijngaarden-Cremers et al., 2014; Head et al., 2014). Conversely, female individuals tend to display a higher intensity of ASD features (Carter et al., 2007; Holtmann et al., 2007; Rynkiewicz et al., 2016). However, several more results indicated that there were no discernible gender disparities in the severity of core symptoms associated with ASD (Andersson et al. 2013; Holtmann et al. 2007). Hull et al. (2017a) conducted a meta-analysis of 13 studies that included both adults and children. The findings of the analysis showed that there were no significant disparities between genders in terms of socio-communicative abilities or restricted and repetitive behaviors (RRBs). The inconsistencies observed across meta-analyses may be attributed, in part, to measurement differences. While certain studies relied on clinical observations such as ADOS and Autism Diagnostic Interview-Revised (ADI-R) as measures, others placed emphasis on reports provided by parents. This is further compounded by the often-small sample sizes and intrinsic heterogeneity of Autism Spectrum Disorder.

Studies on gender disparities among autistic adults have shown equally contradictory results. In an early study, Baron-Cohen et al. (2001) reported that there were no significant gender differences in the results of the Autism Spectrum Quotient (AQ). Males with ASD demonstrated more intense autistic symptoms and minimal empathy than autistic females, however a greater ability to analyze (Baron-Cohen et al., 2014). Pisula et al. (2013) reported that male autistic individuals exhibited superior performance exclusively on the communication rating scale of the Autism-Spectrum Quotient (AQ). A further investigation revealed that females with autism exhibited superior performance on the comprehensive AQ score (Lai et al., 2011). According to Wilson et al. (2016), no statistically significant difference was observed

between genders in socio-communicative signs among high functioning individuals. However, males exhibited more restricted and repetitive behaviors (RRBs) than females. Subsequent analyses indicated that male individuals exhibiting severe autistic symptoms exhibited superior performance on socio-communicative domains. Conversely, females with atypical autism, or Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS), exhibited significant socio-communicative deficits, with no discernible gender differences on the Autism Diagnostic Observation Schedule (ADOS). Lai et al. (2011), contrarily, found that autistic females displayed comparatively lower levels of socio-communicative challenges in comparison to autistic males. However, they reported higher levels of autistic traits on Autism Quotient (AQ). The above findings suggest that gender differences in autistic individuals manifest differentially according on the kind of assessment utilized (e.g., parent report, self-report, or clinical observation) however there are still discrepancies in each measuring form.

As previously mentioned, a portion of the difficulties in determining gender discrepancies may be attributable to the disguising of certain signs. Females may be better positioned to "camouflage" of autism symptoms than males, resulting in difficulties to identify ASD (Bargiela et al. 2016; Rynkiewicz et al. 2016; Hull et al. 2017b;). This camouflage could take the shape of altering one's external social representation, including compelling oneself to exhibit convenient eye-contact and facial expressions, or even acting to look more ordinary (Hull et al., 2017a), even hiding unsuitable habits (Corbett et al. 2021). Surprisingly, young autistic girls could mask their behaviors (Dean et al., 2017). The implementation of preventative measures could potentially decrease the probability of obtaining a diagnosis (Dworzynski et al. 2012).

In order to evaluate the efficacy of camouflage, Lai et al. (2017) utilized a deductive approach by subtracting the standardized clinician-rated Autism Diagnostic Observation Schedule (ADOS) results out of the established self-report measures of ASD symptoms

and Reading the Mind in the Eyes score. He discovered that autistic females camouflaged more than male individuals. In addition, camouflage has been connected positively with the intensity of symptoms resulting from mood in autistic males. In addition, the phenotype shown by autistic females may not necessarily reflect their worldview. This, in connection with the delayed diagnosis in females can have a negative impact on well-being and life quality (Begeer et al., 2013).

### **1.9 Pathology of Autism Spectrum Disorder**

The investigation of brain function and development has been a focal point of research on ASD for an extended period. Through experimental and postmortem research, pathologies of the central nervous system (CNS) identified concentrate on morphological and cellular levels, for instance in neurons. According to these investigations, researchers may infer that ASD is characterized by neuro-pathologies. Recent study on immunological responses and gut-brain interaction by Matelski and Van de Water (2016) has indicated, however, that ASD disorders occur outside of the CNS.

#### **1.9.1 Neuropathology**

Various researchers have highlighted anomalies such as increasing head circumferences as well increasing volume within the skull among 1–4-year-old children who subsequently received an ASD diagnosis. Research on meta-analysis related to volume examining the structure of the brain for young autistics identified structural changes in the pericentral region, the lateral occipital lobe, the proximate to the right parietal operculum, the basal ganglia, and the medial temporal lobe (Nickl-Jockschat et al., 2012); nevertheless, for autistic adults, previous reports stated anatomical anomalies like relatively smaller cerebellar volume, large intracranial volume, changed volume of the corpus callosum and hippocampus, or larger amygdala volume. This was not confirmed using a large size of sample (Haar et al., 2016). Therefore, it has been postulated that untimely brain enlargement in autism is pursued

by a growth stop or possibly a degenerative period throughout development (Courchesne et al., 2011). Moreover, the identified overall anatomic anomalies could not be clearly correlated with the clinical phenotype of autistic patients.

ASD patients were observed to have altered neural connections. There was less connection between distant brain areas and more connectivity between proximal brain regions. Nonetheless, there are contradictory findings, and other investigations could not corroborate this result (Mohammad-Rezazadeh et al., 2016).

There have also been reports of abnormalities in the cyto-architecture of the brains of Symptomatic patients. For instance, the number of cerebellar Purkinje cells was shown to be lower in ASD brains (Fatemi et al., 2012). The most evident neuropathology of ASD, however, is synaptic disruption.

### **1.9.2 Extracerebral pathology**

Outside the brains, researchers, recently, have started to study the function of certain other organs in ASD. The gastrointestinal (GI) system has been significantly involved in autism, with many autistics experiencing GI dysfunction. The prevalence of gastrointestinal (GI) abnormalities among individuals with ASD varies widely, with reported rates ranging from 20% to 86%, depending on the specific research investigation (Buie et al., 2010). Individuals with ASD exhibit a higher prevalence of Gastrointestinal (GI) dysfunction compared to neurotypical individuals. Furthermore, there appears to be a correlation between the severity of GI anomalies and the severity of autism (Adams et al., 2011), suggests a possible function for the Intestinal environment as an identifier of autism as well an aspect in its pathogenesis (Bjørklund et al., 2020). The most often reported GI disorders are stomach discomfort, bloating, constipation, gastroesophageal reflux, and diarrhea (Wasilewska & Klukowski, 2015; Wang et al., 2011).

Additionally, increasing gastrointestinal permeation in autistic individuals and

experimental models of ASD (animals) has been described (D'Eufemia et al., 1996; De Magistris et al., 2010; Hsiao et al., 2012), resulting to a theory that "leaky gut" contributes to systemic inflammation in autism. Interestingly, barriers impairment is also prevalent in inflammatory problems of the gastrointestinal tract, for instance, Celiac disease, inflammatory bowel disease, and Crohn's disease, furthermore establishing a correlation between immune function and Intestinal disorders. In certain hereditary variants of ASD, genes mutations influencing the central nervous system strongly impact the enteric nervous system of the stomach, resulting in gut dysmotility (Fröhlich et al., 2019; James et al., 2019).

It is known that the intestinal microbiome influences behavior and plays a key in neurodevelopment (Mayer et al., 2014). Numerous studies have demonstrated dysbiosis of the gut microbiome in autistic individuals as well as animal models. The examination of the microbiome in autistic vs non-autistic people revealed changes in stool and feces microbial diversity (Finegold et al., 2010; De Angelis et al., 2013; Kang et al., 2013; Kang et al., 2017; Kang et al., 2018). In addition to aberrant microbiome, ASD patients have an altered microbial structure that may aggravate Gastrointestinal diseases and systemic inflammation (Vela et al., 2015). Multiple scholarly investigations have documented alterations in the Bacteroides and Firmicutes microorganisms at the phylum level (Williams et al., 2011; De Angelis et al., 2013; de Angelis et al., 2015; Strati et al., 2017; Coretti et al., 2018; Kong et al., 2019; Liu et al., 2019), even though differing accounts attributed to differing in sample size, inclusion or exclusion of people involved with recognized Gastro intestinal dysfunction in the investigation, general methodology, and the variations in dietary patterns attributed to diverse countries of origin. Moreover, on the phylum level, Actinobacteria in autistic individuals vary from typical individuals (Finegold et al., 2010; Coretti et al., 2018; Liu et al., 2019). The alteration of the gut microbiome and the abnormal functioning of the gastrointestinal epithelial barrier, commonly referred to as "leaky gut," can elicit inflammatory responses that impact cognitive

processes, either through direct or indirect means, ultimately leading to the autistic neuropathology (Rogers et al., 2016; Cryan et al., 2019).

### **1.10 Speech, Language, And Communicative Skills**

The manifestations of autism spectrum disorder (ASD) pertaining to behavior and associated illnesses exhibit significant heterogeneity, nevertheless the acquisition and utilization of language continue to pose a persistent obstacle (Lord & Paul, 1997; Rutter & Schopler, 1987). Autistic individuals often exhibit normal performance on nonverbal IQ assessments, despite experiencing notable constraints or limitations in their language abilities (Gluer & Pagin, 2003; Wetherby, Prizant, & Schuler, 2000). Developmental psycholinguists have paid considerable attention to the distinctive speech and language difficulties of autistic children. However, the basic principle of these deficiencies has still not been specified.

There is considerable linguistic, behavioural, and cognitive variation between and within autistic individuals. Approximately 35 % of autistic children may not acquire effective speech, according to some estimates (Mesibov, Adams, & Klinger, 1997). Forty percent to seventy-five percent of autistic individuals exhibit IQ values compatible with a definition of mental retardation (Frith, 1989; Zelazo, 2001). Even among youngsters with a normal IQ, the diversity and form of language problems persist. Consequently, language deficiencies could not be solely explained by general intellectual problems (Chan, Cheung, Leung, Cheung, & Cheung, 2005).

Focusing on the subset of autistic individuals with the highest level of cognitive and linguistic functioning is the optimal strategy for determining the cognitive and language deficiencies unique to autism (Lord & Paul, 1997; Rutter, 1983; Tager-Flusberg, 1985a, 1985b). This particular group of individuals presents an opportunity for researchers to elucidate the idiosyncratic abnormalities associated with autism, which cannot be attributed to more generalized cognitive impairments. Whereas the findings cannot be generalized to the entire population of autistic individuals as well as related conditions, they could potentially stimulate

further research in other subgroups that are significantly more impaired.

### **1.10.1 Articulation and Prosody**

Autism is typically accompanied by a delayed initiation of speech. Amidst the delays, autistic children appear to display conventional patterns of phonological errors and language acquisition (Bartak, Rutter, & Cox, 1975; Gluer & Pagin, 2003; Kjelgaard & Tager-Flusberg, 2001). Consequently, autistic children phonology corresponds to their developmental stages. Recent research, however, has cast doubt on such conclusions. according to Flipsen (1999), 33 % of HF adults and adolescents with Asperger and autism demonstrated distortions inaccuracies. It compares to estimations of 1–2% of the average adult population. One of the issues regarding previous findings was that researchers only considered elementary school and preschool pupils (Flipsen, 1999; Shriberg et al., 2001).

Autistic individuals who communicate verbally have difficulties with prosody understanding and use (Shriberg et al., 2001). Despite the improvement in other areas of language and communication, often these impairments persist over time (Simmons & Baltaxe, 1975). It has been demonstrated that atypical prosody negatively impacts the perceived speaker's social - communication ability (Paul et al., 2004; Shriberg et al., 2001) Additionally, researchers noted that the aberrant prosody of autistics would be the aspect generating the first perception of weirdness (Mesibov, 1992).

The analysis of prosody may be classified into the subsequent overarching classifications: (1) pragmatic prosody, which is used to convey social information (beyond the literal meaning of the utterance; (2) affective prosody, which is the alteration in register that conveys the speaker's particular emotions; and (3) grammatical prosody, which marks syntactic information in an utterance. Paul, Augustyn, Klin, and Volkmar (2005) evaluated (30) autistic persons between the ages of 10 and 49. Researchers discovered that all ASD-affected speakers had severe affective and pragmatic prosody issues. Additionally, difficulties with grammatical

prosody were observed.

### **1.10.2 Semantics**

In the earliest phases of language learning, autistic children have exhibited semantic difficulties. Typically, the very first terms acquired by autistic children are specific item names, example "vehicle" and "cookie". Early vocabulary of autistic children is devoid of terms such as "all gone", "more", and "up". (Menyuk & Quill, 1985).

Even though it is undeniable that autistic children exhibit semantic problems, they exist differing opinions as to their nature. Through a sequence of testing investigating categorizing and naming skills, autistic children performed comparably to control groups of similar mental age (Tager-Flusberg, 1985a; Ungerer & Sigman, 1987). The results suggest that the semantic abnormalities observed in autistic children are a manifestation of cognitive deficits rather than being exclusive to the disorder.

However, additional data suggest that autistic youngsters exhibit semantic abnormalities that cannot be explained by cognitive impairments. Autistic children are unable to employ semantics to encode and retain spoken information (Bowler, Matthews, & Gardiner, 1997; Tager-Flusberg, 1991). In free memory tests, the participants' recall of associated word lists did not demonstrate a significant improvement compared to their recall of lists containing unrelated words. (Tager-Flusberg, 1991). Furthermore, they comprehend texts using syntactic word order rather than semantic understanding procedures (Paul, Fischer, & Cohen, 1988).

Even though many autistic children display vocabulary abilities appropriate to their age on standardised tests, there still is persuasive proof that the lexicon's underlying structure might be abnormal as well as deficient (Dunn & Bates, 2005; Gerenser, 2004; Kjelgaard & Tager-Flusberg, 2001). In a word-fluency experiment, Dunn, Gomes, and Sebastian (1996) discovered that autistic children presented considerably a small number of conventional examples than children with typical development or language impaired children

having the same age. This seeming heterogeneity among lexical categories may impede accessing to archetypal examples.

Children with autism have an unusual lexical structure, as indicated by the results of more regulated web exercises. Gerenser (2004) examined the lexical structure of autistic children using an online stimulation experiment. Specifically, name response time was tested in the context of a picture naming assignment comprising category prime numbers (e.g., nose–head), identity primes (e.g., head–head), and associate prime (e.g., hat–head). Findings indicate substantial disparities among autistic children and the control group in the association prime condition. In associating activities, autistic children did not display the significant priming effect observed in the general population. Additionally, variations have been seen in semantic priming tests. Kamio, Robins, Kelley, Swainson, and Fein (2007) studied the name response time of autistic adolescents and age-matched counterparts with normal neurodevelopment. The control group displayed strong priming effects of semantic relevant terms; however, the autistic respondents had no such effects.

These behavioural results are supported neuro-physiologically by recent developments in electrophysiological studies. Dunn and Bates (2005) discovered substantial differences in potentials related to events (ERP) responses between autistic children and ordinarily developing youngsters. In a single-word semantic identification challenge, autistic children frequently lacked the ability to differentiate between context-dependent terms.

Autistic children tend to depend on rigid categorization systems based on rules (Klinger & Dawson, 1995, 2001). They and their normal functioning classmates were shown photographs of nonsensical items to classify. For one situation, the youngsters were provided the membership requirements (e.g., large head, yellow, three eyes); in another, they were not. Once provided the category membership requirements, the two groups of youngsters were capable of classifying unfamiliar objects. In the "zero rule" situation, only normal youngsters

were capable for generating new subcategories that used a model technique. Autism-afflicted children were not capable to identify the shared characteristics of unfamiliar objects to construct a prototype.

Complexity and importance characterise the semantic creation and processing part of languages. Recent studies and anecdotal evidence indicate that autistic children have specific issues in semantics development as well as linguistic comprehension. Future electrophysiological and behavioural studies would be crucial for elucidating the precise elements of these abnormalities and guiding future treatments (McGregor).

### **1.10.3 Syntax**

There are contradictory results about syntax development. Various researches have determined that autistic children do not have any particular difficulties with syntax understanding or output (Gluer & Pagin, 2003; Tager-Flusberg, 1994; Waterhouse & Fein, 1982). The complexity as well as utterances length appeared equivalent to those of persons with comparable cognitive development.

A longitudinal study spanning two years was conducted to distinguish between six high-functioning autistic children aged between three to six years and six children with Down syndrome who had the same mental age. The results demonstrated comparable syntax improvement between both groups (Tager-Flusberg et al., 1990). Additionally, their development did not deviate from the norms.

However, alternative perspectives posit that children with autism may exhibit distinctive irregularities in their syntactic development and processing. (Boucher, 2003; Kjelgaard & Tager-Flusberg, 2001). As an instance, ordinary children are considerably good than autistic children at remembering well-formed phrases considering syntax, independent of the extent of semantic relations (Ramando & Milech, 1984). Furthermore, autistic children utilise less morphemes than ordinary youngsters (Bartolucci, Pierce, & Streiner, 1980). Although

vocabulary and IQ levels are all within standard range, some autistic children have distinct syntax abnormalities on standardised language skills (Kjelgaard & Tager-Flusberg, 2001).

There are still a number of unanswered problems surrounding the use and development of syntax for autistic children. Previously, the majority of study has focused on the utmost fundamental syntactic components, yet conclusions have been inconsistent (Fletcher). Recent results indicating syntactic and morphological abnormalities which cannot be explained by cognitive deficiencies have caused concern regarding a potential correlation between specific language impairment (SLI) and autism (Kjelgaard, & Tager-Flusberg, 2001). Further study is required to understand the possibility of comparable language characteristics existence in certain autistic children and SLI children that indicate a superficial similarity or a subtype of autism. There is a plausible conjecture that the genetic factors involved in SLI may also be involved in a particular subset of autistic individuals (Kjelgaard & Tager-Flusberg, 2001).

#### **1.10.4 Pragmatics**

Social skill deficiencies are among the distinguishing characteristics of ASD. Therefore, it is not astonishing that autistic people have severe pragmatic difficulties. Pragmatics is the context-appropriate use of language (Fujiki & Brinton). Particularly, pragmatics pertains to the standards that regulate social interactions (Prutting & Kirchner, 1987). Pragmatic impairments are observed across the entire spectrum. Individuals possessing advanced linguistic skills may encounter challenges when attempting to effectively communicate within social contexts (Klin & Volkmar, 1997). The inadequacies in social communication often result in a disparity between an individual's Intelligence Quotient and their appropriate behavior (Volkmar, Klin, Schultz, Rubin, & Bronen, 2000).

As an illustration, a person might possess a normal range of IQ while being incapable to engage adequately in a discussion, and might have a college education while being incapable to maintain employment owing to an incapability to react to social signals. ASD is marked by

impairments in non-verbal communicating abilities. deficiencies involve difficulties with understanding and using intonation and gestures, an incapability to interpret a facial expression, and qualitative concerns with eye contact (Lewy & Dawson, 1992; Mundy & Crowson, 1997). Problems with this latter often entail an inability to maintain acceptable eye contact throughout discussions and other social environments. In certain instances, the person compensates for eye contact during a discussion by looking attentively. The majority of communication in social contexts is nonverbal. Therefore, ASD individuals frequently misinterpret important social cues. Conversational skills are severely impaired in those with ASD (Loveland & Tunali, 1993). Individuals exhibit many empty turns, difficulty to maintain a conversation's subject or substance, and fewer initiations. This frequently results in irrelevant or socially incorrect remarks (Klin & Volkmar, 1997). Additionally, ASD persons struggle in turn-taking and subject persistence. They frequently possess difficulty detecting and mending communication problems (Prizant & Rydell, 1993).

The existence of a major pragmatic language problem in autism is not contested. A subject of contention is the existence of a subset of autistic children to be pragmatic language-impaired (PLI). PLI, previously identified as semantic-pragmatic dysfunction, pertains to a subset of children who exhibit proficient expressive language skills and articulate speech, nevertheless struggle to employ language in a proficient manner (Bishop, 2000 Presently, there is a research inquiry regarding the correlation among autism, PLI, and SLI (Bishop & Norbury, 2002). The potential association between PLI and autism appears to be stronger than that between PLI and SLI. It is plausible that PLI represents a distinct subtype of autism, which is typically characterized as high-functioning autism (Shields, Varley, Broks, & Simpson, 1996).

It has been suggested that a subset of children with PLI may fall within the intermediate range of the SLI and ASD categories (Bishop, 1998, 2000). This implies that they may display some features of SLI and certain autism symptoms, however may not satisfy the diagnostic

criteria for an autism. Empirical inquiry into the association among SLI, PLI, and ASD is limited. Bishop and Norbury (2002) conducted the most exhaustive inquiry to date. The study conducted examined a cohort of 12 children aged between 8 to 9 years who exhibited language impairment. The findings of the study revealed that certain children met the diagnostic criteria for PLI but did not meet the criteria for autism. This finding is incongruent with the hypothesis positing PLI as a subtype of autism. The proposal posits that SLI, PLI, and autism are situated on a continuum lacking clear demarcations. It is expected that future research will identify a wide range of underlying explanations for pragmatic difficulties in language-impaired youngsters (Bishop & Norbury, 2002). A comprehensive language intervention program for individuals with ASD must effectively target the challenges associated with social communication, regardless of the exact diagnosis. In addition, a thorough examination of the kid must include the child's whole clinical picture, not simply his or her speech impediment (Bishop & Norbury, 2002).

### **1.11 Interventions**

In the last decade, a significant amount has been published on the therapy of autism regarding patients' speech and language abilities (Corsello, 2005; Goldstein, 2002). Interventions vary between behavioural methods to social and developmental pragmatic framework. Four different approaches have been implemented; (01) the conventional behaviour approach (Lovaas, 2002), (02) the natural behaviour approach (Koegel, 1995), (03) the developmental approach (Gerber, 2003), and (04) the social-pragmatic approach.

Empirical evidence indicates the efficacy of conventional behavioral strategies, such as discrete trial intervention, in addition to more natural valid behavioral interventions, such as naturalistic learning method, to effectively treat speech deficiencies in autistic individuals (Koegel, O'Dell, & Dunlap; Lasky, Charlop, & Schreibman; Lovaas, 1987; Buffington, Krantz, McClannahan, & Poulson, 1998). The Developmental Model

(DM) (Greenspan, 1997; Greenspan & Wieder, 1998; Prizant, Wetherby, & Rydell, 2000) is a commonly discussed intervention for addressing difficulties with communication in individuals with autism spectrum disorder. These intervention strategies are thorough and address the variety of difficulties faced by students on autism. Although there is a lack of substantial scientific data to support either hypothesis, both are substantiated by anecdotal evidence. Greenspan and Wieder (1997) examined the charting of children treated with DM and concluded that the plurality of individuals had shown improvement. This model has evolved throughout time as a result of continuous study into the learning characteristics of autistic children.

It has also been determined that augmentative/alternative communication (AAC) is useful for supporting speech–language development in autism. Empirical evidence indicates that the implementation of the Picture Exchange Communication System (PECS; Bondy & Frost, 1994), sign language, and other visual communication modalities may enhance the linguistic, communicative, and verbal abilities of individuals diagnosed with autism spectrum disorder (Charlop-Christy, Carpenter, Le, LeBanc, & Keller, 2003; Konstantareas, 1984; Layton & Baker, 1981).

The empirical support for the effectiveness of Facilitated Communication (FC) as a form of Augmentative/Alternative communication (AAC) is currently lacking. The practice of Facilitated Communication (FC), which originated in Australia and gained prominence in the United States (Biklen, 1990; Crossley, 1992), involves a moderator providing physical assistance to an individual with autism by supporting their shoulder, hand, or arm while they engage in keyboard writing. Proponents of Facilitated Communication (FC) have put forth remarkable assertions that individuals with ASD possess exceptional reading and cognitive abilities, and that their challenges in self-expression are primarily linked to limitations in motor function. (Biklen, Morton, & Gold, 1992; Biklen & Schubert, 1991). In light of the contentious

and multifaceted contentions posited by the FC cohort, coupled with the dearth of theoretical substantiation (Hudson, 1995), a significant volume of empirical scrutiny has been undertaken. Throughout the past decade, a considerable number of meticulously conducted inquiries have yielded negative results regarding the efficacy of FC (Mostert, 2001). Notwithstanding the lack of dependable data, FC remains to receive endorsement from the autism spectrum disorder community.

In light of the broad spectrum of language traits that are linked to ASD, a thorough evaluation of each individual is imperative. In addition, it is essential to comprehend the factors that may explain certain deficiencies. Many persons with ASD, for instance, have trouble processing transitory stimuli (Frith, 1989, Quill, 1997). This phenomenon has the potential to make a substantial contribution towards the advancement of both expressive as well as receptive language abilities. The deficient establishment of joint attention can have an adverse effect on the acquisition and development of language (Baron-Cohen et al., 1997; Mundy & Crowson, 1997). Additional learning attributes that warrant investigation include the prioritization of stimulus over selectivity (Lovaas, Koegel, & Schreibman, 1979), challenges pertaining to social contingencies as well as motivational factors (Lovaas & Smith, 1989), and imitation abilities and diminished observation learning (Rogers & Pennington, 1991). Concerning which therapies are being used for autistic persons, there is still much dispute and controversy. Despite the fact that certain intervention models have more experimental data supporting their effectiveness, there is no proof to suggest that one strategy is preferable (Corsello, 2005). consequently, no one therapy is suitable for all patients.

An intervention strategy ought to be chosen concentrating on the individual's strengths, weaknesses, and learning profile. Only two things have been shown to be true about interventions and getting the greatest results: It is imperative to commence the process at an early stage and maintain a high level of intensity throughout (Dawson & Osterling, 1997).

### **1.12 Autism in Algeria**

Algeria is Africa's biggest nation and is situated in the northwestern part of the continent. Algiers is the country's capital. As a result of its long history of civilisation, Algerian community is unique than other Arabic societies in the Middle East (Algerian dialect of Arabic). Spanning from the Mediterranean Sea to the southern regions of Mali and Niger, and extending from the eastern borders of Tunisia to the western periphery of Morocco, it is a large nation of 2.38 million square kilometres that stretches across northwest Africa. Over 43 million people live in Algeria (Countrymeters, 2021). Largely as a result of its vastness, most people in the nation choose to reside in the northern region, which is bordered by the Mediterranean Sea.

From ancient Phoenicians to modern-day Turks and Sub-Saharan African nations to the French and the Spanish who have inhabited Algeria for millennia have contributed to its rich linguistic heritage (Douglas, 2005). Contrary to popular belief, the large percentage of Algerians (90 percent of the population) identify as Arab, making them the country's biggest ethnic group out of a total population of over 30 million. Within the Algerian context, there exist various Berber and Berber-speaking ethnic groups, with the Kabyles constituting the largest group. The Kabyles are primarily concentrated in the Kabylie region situated to the east of Algeria's capital city, Algiers. Additional notable groups include the Chaoui, located in the northeastern region of Algeria, as well as the Mizabs and Tuaregs, who inhabit the southern desert region of the country. There are now 48 provinces and 48 governors in Algeria, which was established as an independent republic in 1962; each province has a governor-general who has been selected by the Minister of Interior.

Algeria has little information regarding ASD and autistic services. Prior to this, prevalence research has not been provided. Consequently, Algeria possesses no authorized demographic estimate for autistic individuals. Autism is still obscure in Algeria, with some claiming it is a disability and others claiming it is a disease. It is neither a disease nor a disability,

but rather a spectrum. In a symposium on autism that took place on November 22, 2016 in Sidi Belabes, Dr. Benhoudga, a licensed psychologist with extensive experience working with children diagnosed with autism, posited that a subset of individuals diagnosed with autism may not actually meet the diagnostic criteria for the disorder. In this regard, he asserts: “Children who present with attention deficit disorder, obsessive-compulsive disorder, or learning disabilities may occasionally be misdiagnosed as having autism spectrum disorder. Multiple instances have been observed wherein initial diagnoses of autism were subsequently revised to Attention Deficit Hyperactivity Disorder (ADHD) over the course of time.”

Since ASD is recognized via the national screening program, Dr. Benhoudga confirms that this program does not exist in Algeria. Consequently, autistic children are frequently diagnosed by psychiatrists either in private clinics/organizations or at the hospital. In addition to that, the Algerian Program does not give any state-funded special schools, which pushed many parents to choose private school education. In Algeria, positions in day care centers are offered for children with severe or other disorders, such as intellectual impairment. Unfortunately, on one hand, these services are only accessible in major metropolitan areas and likely only to wealthy families. Numerous parents of autistic children have reported about the unwillingness of the vast bulk of nursery to enroll their children. Conversely, numerous preschool institutions allocate resources towards accommodating autistic individuals and impose a premium fee, often threefold the standard rate, for their specialized services. As a result, this arises since Algeria lacks qualified centers.

Comprehensive care for individuals with neuro-developmental impairments involves collaboration across schooling, social development services, and health. Meslem (2017) stated that the National Solidarity Ministry is collaborating along with the Ministry of Education to launch integrated courses in schools in order to give autistic patients with an adequate education that considers speech and psychological therapy consideration. The Algerian Ministry of

Education, in collaboration with the National Solidarity Ministry, has put forth a proposal to augment the quantity of special education classes for autistic children, to ensure their educational needs are met.

Currently, there exist 142 academic institutions distributed across 22 distinct states that have set up sections pertaining to this particular category, according to the Minister of Education. The total of autistic children attending school has attained 1,236, which is insignificant compared to the large population of autistic children that need specialized training.

### **1.12.1 Autism Challenges in Algeria**

Individuals with autism face several hurdles that impede their recognition as citizens. The lack of a governmental healthcare reform that may reduce the monthly costs of medical therapeutic strategies for autistic individuals' parents is the first impediment.

Inclusion of autistic children into the school system is the second barrier. The present educational provisions for autistic children within Algeria are limited. to a select few classes within public schools, which are overseen by local organizations. It is worth noting that there are currently no public schools in Algeria that are specifically designed to cater to the needs of autistic children. Given the absence of specialized public schools catering to the needs of autistic children in Algeria, the prevailing practice is to integrate them with other students who exhibit mental disabilities. This latter will have a bad influence on autistic population which must have special care.

As a result, the third barrier is the lack of skilled professionals working in this sector, a consequence of the government's unwillingness to undertake the obligatory instruction of capable personnel to occupy this void.

From a cultural standpoint, autism is infrequently addressed in the media platforms, save for a handful of articles that are released each year on April 2nd in observance of the International Day of Autism. Consequently, the state of autism awareness in Algeria has

remained stagnant.

### **1.12.2 Algerian research on autism**

In the year 2015, Mounia Meslem, the formerly Minister of National Solidarity, Family, and Women's Status, introduced a proposal to institute a national center of reference for ASD (Allafrica, 2015). During a periodic national conference Council on Disability, the Minister stated that this centre would be responsible for collecting resources, developing documentation, and establishing orientation and diagnostic mechanisms for this group of individuals with disabilities. However, this project is not yet fulfilled. According to our best knowledge, this study represents one of the initial comprehensive investigations into the subject of ASD in Algeria. As a case study, the present study endeavors to depict the current Autism Spectrum Disorder state in Algeria. In 2021, the current minister of National Solidarity, Family and Women's Affairs, Kaouthar Krikou, in a presentation at a government meeting on Monday, announced the opening of 238 special classes in the three levels of education for autistic children.

### **Conclusion**

Over time, autism spectrum disorder has developed. Previously, the disorder was just an unidentified developmental delay that was grouped in with intellectual disorders. Today, it is regarded as a significant neurologically based condition, a huge public health concern, and a major research area. Researchers have tried and failed to uncover a reason for this disorder. Despite these difficulties, research is moving in increasingly complex directions. Numerous therapies have been developed to assist children with autism in maximizing their capacity for development and becoming socially proficient, regardless of the severity of their impairments. There is reason to be positive.

## **Chapter Two**

### **Autism Spectrum Disorder in Relation to Pragmatics**

Introduction.....	63
2.1 Pragmatics Definition .....	63
2.2 Pragmatics and Normal Development .....	70
2.3 Developmental Pragmatics in Children’s Language Development.....	71
2.3.1 The Anticipated Milestones for Developmental Pragmatics .....	72
2.3.2 Research Viewpoints on Developmental Pragmatics.....	73
2.3.3 Learning Environments Through Conversation .....	74
2.3.4 The Emergence and Development of Pragmatic Skills .....	75
2.3.4.1 Speech Acts Development in Young Children.....	75
2.3.4.2 Conversational Skills of Children.....	75
2.3.4.3 Social and Politeness Parameters of Language Use .....	78
2.4 Pragmatics and Impairment .....	80
2.4.1 Autism and Deficits in Pragmatics.....	83
2.5 Theories in Pragmatics Deficits .....	86
2.5.1 The Affective Theory .....	86
2.5.2 The Meta-Representation Theory .....	90
2.6 Factors Affecting Pragmatic Development.....	96
2.6.1 Cultural Differences .....	96
2.6.2 Socio-economic Status (SES).....	97
2.6.3 Effects of Parents and Context.....	97
2.6.4 Age .....	98
2.6.5 Gender .....	98
2.6.6 MLU .....	99
2.7 Pragmatic Competence is of Utmost Importance.....	100
2.8 Previous Research on Pragmatic Impairment in Autism Spectrum Disorder .....	101
Conclusion .....	107

## **Chapter Two**

### **Autism Spectrum Disorder in Relation to Pragmatics**

#### **Introduction**

Numerous disciplines, such as speech language pathology, linguistics, sociology, and others, include pragmatics among their fields of study. Pragmatics is the study of context in communication or its constituent aspects. Social Communication is using language in social circumstances. This relates to the child's capacity to utilise language in several settings to engage with people. It is the capacity to adopt the viewpoint of another and adapt one's language use appropriately. ASD is characterized by persistent challenges in social interaction and communication abilities in various contexts, in addition to repetitive and limited patterns of behavior, activities, or interests, as per the diagnostic criteria outlined by the American Psychiatric Association (2013). Thus, the present chapter includes an explanation of several notions connected to Pragmatics, its significance, and theories, as well as an in-depth description of how ASD children usually struggle to acquire pragmatics' principles and previous research of Pragmatic Impairment in Autism Spectrum Disorder.

#### **2.1 Pragmatics Definition**

The term "pragmatics" was first used in the area of language and speech pathology by Bates (1976). She stated that pragmatics is "a rule governing the use of language in context" for the purpose of communication (p. 420). According to Marasco et al. (2004), pragmatics: ".....refers to the underpinnings of conversation: how something is said, the intention of the speaker, the relationship between the participants, and the cultural expectations of exchange. It is by its nature, a complicated and an elusive part of communication" (p.2)

Ninio and Snow (1999) propose a more extensive description of Pragmatics, stating that the primary interest is:

The description of phenomena related to the use of meaningful linguistic forms for communicative purposes. Chief among these is the production and

comprehension of speech act--making statements, requesting, promising and the like. Other phenomena include the regulation of conversational exchange; politeness rules and other culturally conventionalized variations in speech register that convey social meaning and determine appropriateness; the control of presuppositions; and the creation of connected discourse (p.2)

Whilst the scope of knowledge to which pragmatics pertains has grown considerably, a difficulty with definitions has arisen as a result. Givón acknowledged this when he stated, "Pragmatics may be likened to a vast terrain whose boundaries are so distant that we perceive them only dimly, given our less-than-exalted vantage point" (1989, p. 1). consequently, the word "Pragmatics" is defined differently in each subject of study. Despite the fact that the definitions are frequently linked or analogous, typically revolving around the concept of context, they may differ considerably amongst disciplines. It is not unexpected, given there are various meanings even within linguistics, depending on the researcher's interest. The varied definitions employed to explain and investigate pragmatics in multiple areas and subareas may result in misunderstanding of terminologies, which in turn can result in uncertainty about the communication aspects that are of relevance to the field of pragmatics.

A semantics and logic viewpoint defines pragmatics as "those aspects of the meaning of the utterances which cannot be accounted for by straightforward reference to the truth conditions of the sentences uttered" (Gazdar, 1979, p. 2). The school of functionalism of linguistics identifies pragmatics as "an approach to description, to information processing, thus to the construction, interpretation and communication of experience. At its core lies the notion of context, and the axiom that reality and/or experience are not absolute fixed entities, but rather frame-dependent, contingent upon the observer's perspective." (Givón, 1989, p. xvii). The above definitions are tailored to their respective subfields of linguistics by including additional ideas from those subfields.

There are a number of linguistics based definition of pragmatics that are more appropriate to the field as a whole. According to Huang, pragmatics is "the systematic study of meaning by virtue of, or dependent on, the use of language" (Huang, 2014, p. 2). The Summer Institute of Linguistics (SIL) suggests somewhat more precise definition: "the study of the aspects of meaning and language use that are dependent on the speaker, the addressee and other features of the context of utterance" (SIL International, 2015). The SIL presents a thought-provoking explanation of what pragmatics encompasses to furthermore qualify their definition: "The effect that the following have on the speaker's choice of expression and the addressee's interpretation of an utterance: context of utterance, generally observed principles of communication, the goals of the speaker" (SIL International, 2015).

Pragmatics and compositional semantics work altogether in interpreting every utterance. A portion of the meaning of a complicated statement derives from the lexical meaning of its components and the manner these components merge; nevertheless, a portion of the meaning demands for the listener to exert more effort. Some sentences are easily explained by compositional semantics; for example, the meaning of the sentence "The cat sat down on the mat" is clearly understood. As soon as this line is said in context, however, the listener must question himself, "Which cat?" and "Which mat?". He must attribute reference. A very analogous statement demonstrates the limitations of compositional semantics further. Consider the example: " The cat sat on the mat". Does the statement depict the imperfective action of a cat sitting on a mat for a prolonged length of time or the perfective action of a cat sitting on a mat? Surprisingly, in such a basic statement, the listener should exert more effort to retrieve the intended meaning by the speaker. In this example, the hearer must distinguish between the multiple (but related) connotations of the verb 'sat'.

Pragmatics is the capacity to comprehend the implied intended message of a speaker. From the lexical level, one must not underestimate the degree to which listeners require

pragmatics. Researchers have extensively recognized that pragmatics is crucial for valuing indexical and other context-sensitive statements, as well as vague statements (e.g., Grice, 1975). Many scholars nowadays think that compositional semantics significantly underdetermines meaning. Murphy (1997; referenced in Wilson and Carston, 2007) used the word "fresh" as an example of the context sensitivity of frequent and seemingly obvious adjectives. He asked respondents to indicate the opposites of "fresh" in several settings. His participants replied contextually, providing antonyms such as the following: dirty shirt, rotten vegetables, frozen fish, sheets recently slept in, dirty/salt water, stale bread, polluted air, tired outlook.

Many scholars nowadays claim that compositional semantics significantly account for meaning with less than the amount of evidence needed. Although these definitions are distinct, commonalities such as context, meaning, and speaker role are existent. Context is essential since, despite the fact that the semantic viewpoint on meaning is founded on validity, there are instances whereby an absolute truth is not readily obvious. In such instances, the speaker's viewpoint and the context of the utterances in making the speech are required to discern the intended meaning of the statement. On one token, the common definition of pragmatics within the area of speech-language disorders is "appropriate social language use" (Volden, Mulcahy, & Holdgrafer, 1997, p. 181). On the other token, in clinical linguistics describes pragmatics as "concerned with problems of explaining textually and contextually based inferential processes involved in communication" (Asp & De Villiers, 2010, p. 21). Not only do these definitions differ from those of linguistics, but they often not, perforce, encompass the same domains as pragmatics in linguistics does

Regarding this endeavour, among the most pertinent definitions of pragmatics originates from the clinical sciences community. As per the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), the criteria for diagnosis for Social (Pragmatic) Communication Disorder elucidate pragmatics as "the social use of language" (American

Psychiatric Association, 2013, p. 48). This definition includes "deficits in understanding and following social rules of verbal and nonverbal communication in naturalistic contexts, changing language according to the needs of the listener or situation, and following rules for conversations and storytelling" as examples of pragmatic deficits (American Psychiatric Association, 2013, p. 48).

This term is fairly wide compared to linguistics' definitions, and this substantial variance explains part of the uncertainty around pragmatics in the ASD literature. When comparing the DSM-5 aforementioned definition to the SIL definition, a noteworthy contrast can be observed. In clinical literature, the term focuses on a behaviour that deviates from the norm without necessarily surpassing it. The emphasis of pragmatics in linguistics is on the meaning formed and understood as a result of the behaviour, rather than the behaviour itself. Aside from the fact that communication partners have specific expectations and assess communication depending on how it conforms to those expectations, there is no mention of norms.

A hearer needs to use pragmatics to access the specific context-based meaning. It would be unreasonable to postulate significant ambiguity in the lexicon because the processing demands would be excessively expensive; it would be more economical to postulate an under-specified semantics and a complementary pragmatics which adjusts meanings based on context.

Just as a claim may be made for a pragmatics that acts on the real meanings of the said words, the same can be said for a pragmatics that enhances the uttered words. When the said words communicate just a minimum proposition (Recanati, 2002), the hearer must provide extra information to describe the whole proposition - what is said. Occasionally, then, a hearer must retrieve an "unarticulated component" of a statement through saturation or free enrichment (Recanati, *ibid*).

For instance, if Cherie tells John, "That book is Tony's," John must determine, or saturate, the relationship between Tony and the book: Did Tony author the book, or did he just

purchase it? If Gordon tells Sarah, "David went to the edge of the cliff and jumped," Sarah must freely elaborate, or enrich, on whether David leaped on the spot, over an obstruction, or down the cliff. Unarticulated but pragmatically significant elements cannot be easily extracted from the surroundings. To adopt an example from Recanati (ibid), if someone states, "Mary has been dancing," it concludes that Mary has been dancing someplace, as all occurrences take place in some location. But the place of the dance has no bearing on what is stated; it is irrelevant. In comparison, consider Margaret and her meal in the line, "Margaret has had breakfast": Margaret's breakfast had to have occurred at some point, but the place in time was not required to be stated; yet, it is, since the phrase does not normally imply that Margaret had eaten breakfast at some unspecified moment in her life.

Pragmatics that acts on and improves word meaning is a pragmatics that adds to the literal meaning of an utterance, or what is stated with an utterance. This is a stunning point, but pragmatics is equally concerned with the implication of an utterance, and does it in a more conventional manner. Consider the following illustration:

**Context:** It is the early hours of the morning. Edward is quite exhausted and must shortly go for a difficult workday. The following conversation occurs:

Would you want a cup of tea, Matthew said?

Edward: Tea would help me awaken.

Though Edward says, "Tea would wake me up," he means to indicate, "Yes, I would love a cup of tea." This intentional, implicit proposition - the implicatum - is the essence of Edward's statement (Grice, 1975). Therefore, we arrive at the following definition of pragmatics: it is the interpreting of implicit, intentional meaning that is part of an utterance's stated content in addition to what is inferred by it. In conclusion, pragmatics is the field of linguistics that studies The linguistic domain that encompasses the pragmatic utilization of language in social settings.

From these speculations on the essence of pragmatics, it is a simple leap to a clinical

application, i.e., a concept of pragmatic dysfunction. If we interpret "pragmatic dysfunction" to indicate that pragmatics as a whole is damaged, then the following should be predicted:

1. Difficulties in attributing semantic meanings to indexical and other sensitive expressions related to context, as well as ambiguous statements, such as deictic expressions like tensed statements or pronouns, and lexical ambiguity.
2. Difficulties with contextually regulated lexical elements, such as ad hoc notions and context-sensitive adjective use (e.g., "fresh").
3. Challenges with saturating and freely enhancing minimal propositions
4. Difficulties with recognising implications.

We may conceptualize that all of (1) to (4) may be true, but also that just some of them may be true; not all pragmatics must be supported by the exact same processes. Consequently, some theories propose that pragmatic abilities vary. For example, Recanati (2003) claims that there are, on one hand, primary pragmatic processing, which primarily deals with saturation and free enrichment and are non-associative and conscious. On the other hand, secondary pragmatic processing, which deals with other pragmatic phenomena and are inferential and conscious. Despite the fact that this putative divergence is debatable, with some theories proposing a single inferential pragmatic process (Sperber & Wilson, 1986/1995), one should be aware of the potential that predictions (1) to (4) may diverge. Most pragmatic theories would likely need to differentiate between (1) and (4) in terms of cognitive difficulty, with (1) being the easiest and (4) the most difficult. The answer to "Which of (1) to (4) is true?" therefore, it is possible to provide insights into the characteristics of autism spectrum disorders as well as identify promising avenues for further investigation.

To define a specific behaviour as a deficiency is prevalent in clinical literature, yet it might suggest "wrongness," that some norm/standard has been disregarded. Nevertheless, not all can be categorized in this manner since standards might differ, particularly in terms of

language. By not prohibiting new evidence due to underlying assumptions, describing behaviours as differences and allowing for their description without core assumptions of standards might give more information and a broader viewpoint. The study presented in this thesis employs the linguistics definition of pragmatics provided by the SIL in order to exclude judgments on the "appropriateness" or "rightness" of social behaviour: "the study of the aspects of meaning and language use that are dependent on the speaker, the addressee and other features of the context of utterance" (SIL International, 2015). This results in a more accurate and unbiased view of language use among individuals with ASD.

## **2.2 Pragmatics and Normal Development**

A comprehensive analysis of pragmatic development is beyond the scope of this thesis; nonetheless, a concise summary will be relevant here. Developmental Pragmatics reveals a progression from childish naiveté to adult sophistication. The emergence of scalar implicatures provides perhaps the strongest evidence for this trend. Although some children are considered pragmatically nave, the age at which sophistication begins to develop is debatable, with some researchers claiming that 69 % of 9-year-olds are pragmatically nave (Noveck, 2001) and others claiming that children as young as 5 show some competence (Papafragou & Musolino, 2003) and even as young as 4 with specific training (Papafragou & Tantalou, 2004). Studies into metaphor comprehension (Noveck, Bianco & Castry, 2001; Winer et al, 2001) and the resolution of ambiguous sentences (Musolino, Crain & Thornton, 2000; Noveck, Guleminger, Georgieff & Labruyere, 2007) provide evidence for such a developmental trajectory. Adults prefer the reading 'Not every horse jumped the fence,' while children either prefer the reading 'No horse jumped the fence' (Musolino & Lidz, 2006). Methodological research by Pouscoulous et al. (2007) suggests that child competency is contingent on experimental variables such as the metalinguistic demands of a task and the existence of foils. Even though the age at which pragmatic sophistication may be shown varies, significant comparisons across groups are

possible.

### **2.3 Developmental Pragmatics in Children's Language Development**

Pragmatics of language is a relatively understudied and disjointed subject of research. Nonetheless, it is no less significant than other basics of language since it determines how language should be used. The social application of language is known as pragmatics. Pragmatics covers, but is not restricted to, conversation initiation, requesting and replying, maintaining subject relevance, asking questions, answering questions. When speaking, it is not simply the words that are said, but also the nuances such as the speaker's implication, how it might be conveyed, the use of eye contact, appropriateness, body language, and intonation. Communication of emotions, ideas, and thoughts requires a high level of pragmatic language skills. These abilities are acquired together with basic language development. Components of pragmatics, like eye contact and smiling, are used in everyday life and specifically emerge at a young age. The unwritten norms of speech are acquired through observing the interactions of others. Children learn to take turns, interact with others, and communicate vital information (Birner, 2013).

Thompson (1997) proposed key characteristics of pragmatic competence which might differentiate it with other main fields of research in linguistics. Firstly, the acquisition of pragmatic competence necessitates a comprehensive comprehension of the interpretation of language and its permissible range of application. Secondly, pragmatics requires an understanding of how the world is shared with each other. Finally, it is imperative to attend to cues derived from the social and linguistic conduct of interlocutors, in conjunction with an awareness of the norms that regulate conduct within social milieus. Stated differently, pragmatic competence enables a person to engage in verbal communication comprehensibly, understand the viewpoints of others, and behave appropriately. Therefore, the cognitive requirements for a child's advanced pragmatic development are: (a) correct comprehension and

perception of spoken language, (b) the ability to produce coherent and understandable spoken language, (c) recognition of cultural norms; and (d) suppression of improper behaviour or spoken language.

### **2.3.1 The Anticipated Milestones for Developmental Pragmatics**

Individuals of various age groups utilize language as a means of engaging with and comprehending the social environment, fostering, cultivating, and sustaining social bonds, and engaging in culturally significant communal endeavors. The process of pragmatic development encompasses the acquisition of communication competencies by children, which involves the ability to effectively and responsibly use language to communicate and perceive others in a diverse range of social situations and activities, while simultaneously adapting to increasingly complex social roles (Hymes, 1972). Contrary to grammar and syntax developments of children, which has been proven to be substantially complete by age five, the acquisition of intricate communication abilities by children is a protracted undertaking.

The fundamental pragmatic competencies manifest themselves early in life, however, they undergo refinement and augmentation during the preadolescent and adolescent stages, thereby equipping the individual to engage in a progressively diverse range of social interactions and ultimately attain complete integration into the culture and society as well. The development of communicative skill by children has significant educational and social implications. Conversational abilities have a significant influence on their exposure to other children's exchanges as well as the establishment of peer-group affiliations in both their primary and secondary languages. Proficiency in these competencies is of paramount importance in the context of adult-child interactions, as it serves to validate children's communicative efficacy as learners and plays a pivotal role in fostering their writing literacy proficiencies:

- By the age of one, a child should respond to his or her name, recognise known people, begin conversation, express some fundamental wants, and participate in familiar activities.
- By age two, children should be utilising words/phrases and engaging in significant verbal and non-verbal turn taking.
- By the age of three, a child should demonstrate improvement in attracting attention with words, introducing topics, and using language to assist others comprehend what they are attempting to say. These abilities continue to evolve throughout time.

Those with pragmatic language impairments struggle with both verbal as well as nonverbal communications, as well as the perception of the communication of others. This might result in conversational problems and misunderstanding of the communicated message. Aside from this, there are age standards for pragmatic skills, since they do not develop simultaneously. Frequently, autistic children have trouble with social interaction and pragmatic skills. Children with basic language problems often exhibit pragmatic difficulties.

### **2.3.2 Research Viewpoints on Developmental Pragmatics**

Research on children developmental pragmatics is diverse that combines child development and linguistic pragmatic , as well as different viewpoints on social interaction and language: language socialisation (Ochs & Schieffelin, 1984), developmentally up-to-date methodologies for the acquisition of child language (Berman & Slobin, 1994), socio-culturally research including developmental pragmatics (Ervin-Tripp, Guo, & Lampert, 1990; Ninio & Snow, 1996; Blum-Kulka & Snow, 2002), and sociolinguistics (Kyratzis & Guo, 2001). The pragmatic development of children in their primary language encompasses a diverse array of interrelated facets of communication skills, including: The start and progression of verbal communicative acts, specifically speech acts, in children; the improvement of conversational abilities; the escalating sensitivity of children towards the social aspects of communication; and

the acquisition of extended discourse genres, such as narratives, by children, explanatory texts, and argumentative texts.

Despite the fact of all the aforementioned, traditions believe that active engagement of children in exchanges with grown-ups is crucial factor in their development of communicative competence, their objectives and approaches vary. Research on developmental pragmatics examines basic developmental processes behind the emergence of a child's pragmatic skills. Their analysis is generally based on evidence that has been either empirically elicited or semi-elicited. Specifically, the assessment of children's proficiency in regulated communicative endeavors serves as the basis for this analysis (Hickmann, 2003). Research on pragmatic development that is informed by socio-cultural perspectives investigates the ongoing development of communication skills in children, which is shaped by their daily communicative interactions with both peers and adults. Studies of this nature place emphasis on the culturally and socially delicate nature of conversations. They aim to investigate the way everyday conversations serve as a cultural constrained foundation for acquisition of children as well as implementation of acceptable linguistic usage (Schieffelin & Ochs, 1986; Blum-Kulka, 1997).

### **2.3.3 Learning Environments Through Conversation**

Within the field of children's pragmatics, interactions between adults and children and peer relationships have been recognized to be distinct developmental and interactive contexts, characterized by diverse participants role, communication styles, as well as levels of conversations assistance. Older People frequently act as a facilitator for children's participation in discourse by serving as an example and promoting Kids proficient and impartial conversations conduct. On the contrary, interactions between peers serve as a reflection of the pragmatic abilities of children in unaided conversations environments. Moreover, the phenomenon of peer talk plays an active role in the pragmatic development of children:

discourse of peers serves as a foundational platform for the development of child's communication skills, roles, and genres that may not be readily available to them in adults and children's conversations, which are characterized by unequal distribution of interpersonal power and knowledge. (Blum-Kulka, Huch-Taglicht, & Avni, 2004).

### **2.3.4 The Emergence and Development of Pragmatic Skills**

#### **2.3.4.1 Speech Acts Development in Young Children**

Research on the verbal acquisition of communication acts (i.e., speech acts) by infants examined, beginning with the preverbal stage, how very young children employ means of language in order to accomplish social behaviours as well as pragmatic purposes attained. Importantly, when infants employ a one-word statement, they may request for action and information as well as generate assertions, answers, and acknowledgments by connecting such statements with non-verbal aims. As an example, the initial verbal appeals comprise a blend of gestures and the designation of the item, for instance, "more," "desire," and "give me" (Ervin-Tripp et al., 1990). At the age of two and a half years, youngsters have an extensive repertory of increasingly complex communicative actions. Through time, children acquire the lexico-communicative and pragmatic means which allow the complete verbal and contextually nuanced realisation of formerly developed interactive intentions, including but not limited to promises, prohibitions, justifications, apologies, explanations, challenges, disagreements, and refusals (Wells, 1985; Ninio & Snow, 1996).

#### **2.3.4.2 Conversational Skills of Children**

The communicative usage of language by children facilitates their ability to respond and request further speech, thereby organizing social interaction as a series of contiguous, reactive, and responsive verbal exchanges that function as fundamental conversational and intersubjective components. Research investigates the acquisition of turn-taking skills, the emergence of salient topics, and the ability to detect and rectify instances of mutual

misunderstanding in children's discourse.

Turn-taking refers to the capacity to arrange verbal engagement by taking turns, i.e., by choosing an acceptable spot for their verbal contribution in discussion. Situationally and culturally responsive turn-taking methods differ based on involvement framework (dyadic versus multi-party), activity, as well as social setting (de Leon, 1998). In Western societies, wherein adults consider infants as peers in conversation from infancy, children establish fundamental turn taking techniques well before their language productions (Trevvarthen, 1979). Typically, in peer relationships, children establish connections with others through adherence to age-appropriate turn-taking protocols by the age of three. However, it is noteworthy that the intervals across the turns are frequently more extended than those observed in adults' discourse (Ervin-Tripp, 1979). The period precision of self-selection is a developmental challenge for young children in multiparty contacts (e.g., family dinner conversation) (Blum-Kulka & Snow, 2002). Likewise, substantial pragmatic socialisation in primary school focuses on institutional mechanisms of turn-taking in education contexts (Cekaite, 2007).

The conversational skill of turn taking is not regarded as an independent ability. In order to maintain and advance topically coherent conversational interactions, it is essential to possess the capacity to select turns that demonstrate relevance to the topic at hand, i.e., the act of responding to and introducing novel information to the ongoing discourse that serves to promote the advancement and evolution of the topic at hand, thereby fostering meaningful dialogue. In encounters with children, parents often bear the majority of subject development tasks. With 2-year-olds, they are able to ask a question, begin a topic, extend and explain confusing utterances, and continue conversational sessions. In child's peer-to-peer interactions, topical cohesion and contingent answers are often produced by means of varied sounds, repetition, and verbal play. From a two-year-old' preschooler' (McTear, 1985), and preadolescent' (Cekaite & Aronsson, 2004) peer interactions, repetitions and partial

recycling are reported, indicating children's advanced syntactic, lexical, and prosodic comprehension of and responsiveness to earlier speaking. The proficient utilization of (incomplete) duplications is, in reality, one of the standard prerequisites for engagement and approval in communicative customs (debates, conflicts, amusement) of individuals of equal standing (Goodwin, 1990).

As early as the age of two years, children's repertoires for sustaining topical consistency encompass semantically and formally different approaches (McTear, 1985). In peer discussion, however, attaining the adult ability to maintain a coherent conversation is a lengthy developmental process. During adolescence, children exhibit a gradual improvement in the topical consistency of their conversations. However, it has been observed that 10-11-year-olds still tend to make logically irrelevant turns in discourse (Dorval & Eckerman, 1984).

The ability of participants to identify, find, and fix misconceptions and conversation breakdown is crucial to the conversation's flow (Schegloff, Jefferson, & Sacks 1977). Beginning about approximately the age of one to two years, there is an observable increase in children's linguistic proficiency, both in terms of their comprehension and their lexico-semantic repertoire. In Western contexts, adults tend to adjust their requests for corrections and clarification to align with a child's verbal capabilities. Before the age of three, children's attempts to repair the conversation breakdowns are reported. Children who are 3 years old exhibit a more extensive range of remedial strategies, utilizing and reacting to requests for clarification that are aimed at contentious aspects of discourse, and subsequently modifying their assertions. In contrast, children who are 2 years old appear to tackle issues of comprehension by persistently reiterating challenging utterances (Ninio & Snow, 1996). Also, in peer relationships, children ages four to six demonstrate a developing interest for the smooth flow of communication and the ability to resolve misunderstandings (McTear, 1985).

Children's growing awareness of the viewpoint of others is centred on their ability to

repair. There seems to be cross-cultural diversity in processes pertaining to the speaker/hearer's obligations for achieving mutual understanding in accordance with the wider set of norms governing interaction. In situations of middle-class Western society, adults' repair initiations have various purposes, including strengthening mutual comprehension and implicitly socialising conversational pragmatics. Given that the speaker has the major responsibility for communication clarity, children speakers are required to offer pertinent contextual details as well as continuously check the quality of their speech. In contrast, investigations conducted in non-Western environments have shown distinct mending methods. In Japan, for example, Youngsters are conditioned for 'intent listenership'; responsibility of ensuring understanding is placed on the listener, thus they are taught to develop their interpretative skills and practice active (non)communication (Clancy, 1986).

#### **2.3.4.3 Social and Politeness Parameters of Language Use**

The domain of pragmatic studies concerns the developing sensitivity of children to the social contexts of language use. This area of inquiry seeks to investigate the developmental trajectory of children's ability to exhibit politeness, adjust the language according to their relations with the recipient and social setting, and excel in various linguistic styles as well as registers.

The indicators of politeness represent a constituent of the sophisticated pragmatic proficiencies exhibited by children. When children reach 2–3 years of age in Western countries, they frequently modify the language of their requests based on the age and the status of the addressee. Children are aware of the need to use indirect requests with the addressee of a higher age and social status (older siblings and adults), however while communicating with the peers, they use straightforward imperative utterances and declarative assertions. Children of school age (7 to 8 years old) definitely expand their pragmatic repertoire: they use semantically and formally various ways to fulfil requests and comprehend as well as develop implicit demands

and indications that consider the recipient's situational constraints (Ervin-Tripp et al., 1990).

Peer interactions provide an optimal context for observing and documenting the acquisition of children and proficiency in social registers. During imaginative play, children engage in the establishment and maintenance of in-character roles through their use of diverse verbal competencies. Play constitutes a critical milieu for the advancement of conversational proficiency, affording youngsters the chance to exercise and refine competencies in domains that are typically associated with elevated social standing, yet remain beyond reach in nurturing, unbalanced adult-child exchanges. At the age of 4 years old, children, who participate in plot play—teacher–student, playing family, or doctor–patient relationships—display awareness to status, social, and gender roles via their varied use of linguistic styles and registers (Andersen, 1990).

Boys and girls in preschool develop gendered language patterns, employing them as a vocabulary of speech techniques to accomplish certain interactional objectives. In mixed-gender groups, female individuals demonstrate adaptability and linguistic management skills that are contingent upon the composition of the participants. This often involves the utilization of assertive and uninhibited speech patterns, which are commonly associated with a masculine and dominant speaking style (Kyratzis & Guo, 2001). The use of register-relevant prosodic resources is crucial for young children, whereas school-aged children rely on cooperative employment of register-relevant lexical methods to establish and uphold their relationships and social roles (Hoyle, 1998). Over the course of time, a multitude of linguistic registers and styles have been cultivated and employed as tools in the identification process of pre-adolescents and adolescents, serving as markers of their association with social class, gender constructs, youth subcultures, or ethnic groups (Rampton, 1995).

In the pre-school years, children who are exposed to multiple languages demonstrate an early sensitivity to language selection, as evidenced by their ability to adjust their lexicon to

align with the linguistic preferences of their interlocutors (Fantini, 1985). Throughout the school years, children refine their abilities to employ different languages to manage social relationships, for example by using code switching as a means of exerting power (Jørgensen, 1998).

## **2.4 Pragmatics and Impairment**

Pragmatics has a role in a diverse array of contexts. Autistic spectrum disease is likely the most well-known example of pragmatic dysfunction; in fact, the clinical diagnosis of autism includes pragmatic dysfunction. There are several ways in which pragmatics is involved in a broad variety of disorders, from right-hemisphere brain impairment (Mitchell & Crow, 2005) to traumatic brain injury (Martin & McDonald, 2003) to schizophrenia (Langdon, Davies & Coltheart, 2002). This contradicts the prevalent belief that Williams Syndrome children are socially and communicatively brilliant. Pragmatic impairment has also been seen among children having Williams Syndrome (Laws & Bishop, 2004). As a result, the fields of cognitive neuro-psychology and abnormal psychology are prime candidates for pragmatic investigation.

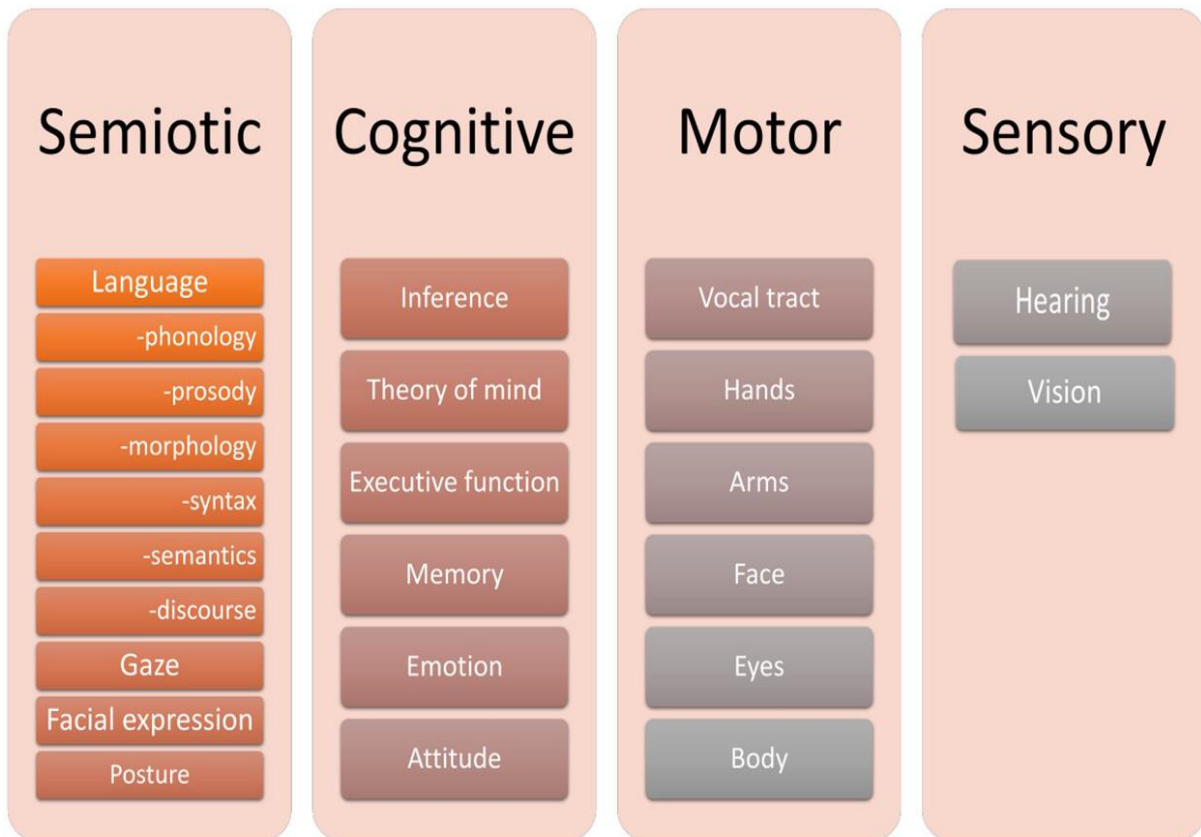
Pragmatic Impairment (PI) is characterised by difficulties with language understanding and production, particularly when it comes to speaking in social contexts. Using language in a social environment in a manner that is appropriate to the circumstances (e.g., formal vs. informal) is a key component of pragmatics, as is the usage of idioms, metaphors, sarcasm, and irony, as well as the informational utterances inclusion of that are important to the conversation. Communication and interpersonal connections may be hindered by a lack of proficiency in pragmatic language usage.

When it comes to the study of pragmatics, its theoretical framework has traditionally been thought to be limited to the study of language exclusively, and its discussion has been concluded within that framework (Verschueren, 1999; Grundy, 2000; Levinson, 1983; Leech, 1983). For

pragmatic disorders, however, therapists have established their own treatment plans (Perkins, 2010). There have been clinical studies of Pragmatic Impairment (PI) that have focused on the nonverbal parts of communication rather than the verbal ones (Perkins, 2010). When Dronker et al. investigated serious Broca's aphasia as well as deafness, they discovered non-verbal social skills and talents existed side by side with language abilities and could be handled as separate entities (Dronker et al. 1998). Additionally, to ASD, PI might be seen in a broad variety of disorders, including aphasia, right hemisphere damage, cognitive decline such like Alzheimer's illness, and traumatic injuries in brains (Avent et al. 1998; Gutierrez et al. 2016; Parola, et al. 2016).

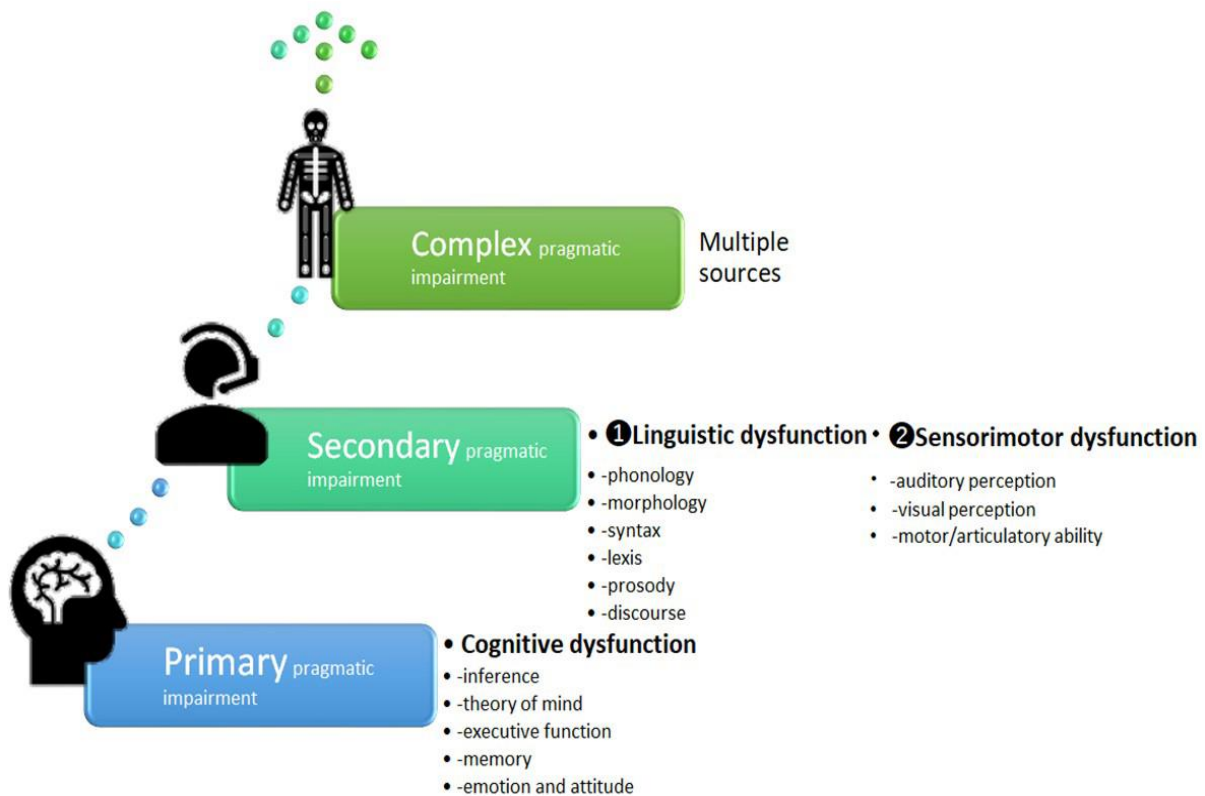
The fact that a number of autistic individuals have high language abilities yet have trouble communicating has long been recognized to clinicians. Cognitive abilities such as memory, executive function, and inferential reasoning play a vital part in interpersonal communication, and it has been stated in the therapeutic profession that cognition is strongly linked to PI as a result of these factors (Perkins, 2010). Research based on neurology has been the prime aim of PI investigations in light of this knowledge (Stemmer, 1999).

Many clinical researchers now agree that numerous components such as nonverbal aspects, language, and cognition should be examined when studying PI in more depth in light of the above. Neurological, symbolic, cognitive, and sensorimotor disorders have been the subject of several earlier investigations (Perkins, 2010; Martin et al. 2003; Paradis, 1998; Murdoch, 1990). Figure 01 depicts Perkins' enumeration of pragmatics' four main components: semiotics; cognitive; motor; and sensory (Perkins, 2010).



**Figure 4.** Elements of pragmatics (adapted from Perkins 2010)

As a result, in Figure 04, Perkins suggested a categorization system for PI that prioritised these aspects: cognitive dysfunction as main, language and sensorimotor dysfunctions as secondary (Perkins, 2010).



**Figure 5.** A Classification Scheme for PI and Underlying Causes (Adapted from Perkins 2010)

In addition to the cardinal characteristics that contribute to the diagnosis of ASD, pragmatic deficiency is another prominent characteristic of the disorder. Autism-related pragmatic deviations often do not break any laws of phonology, syntax, or semantics (Bartak, et al., 1975; Beisler et al., 1987; Ramondo & Milech, 1984; Tager-Flusberg, 1981, 1989, 1991; Wetherby & Prutting, 1984). Indeed, it is possible that it could be the sole linguistic characteristic with varied intensity throughout the spectrum, independent of the functioning level or age of the persons afflicted (Young et al., 2005). Therefore, it is even more crucial to have a comprehensive understanding of this distinctive language trait of autism.

### 2.4.1 Autism and Deficits in Pragmatics

Autism is characterised by very heterogeneous linguistic features. Independent of cognitive and linguistic development, however, it is well-established that difficulties with language usage and its pragmatic components are a defining characteristic of ASD. Even in

adolescence and adulthood, autistic individuals whose language and cognitive skills are generally unimpaired, impaired pragmatic abilities may make it difficult to engage in verbal dialogues (e.g., de Villiers et al. 2006; Paul et al. 2008). Regarding the comprehension aspect, issues are frequently observed whenever the material presented differs from its exact language semantics (e.g., Attwood 2015).

Examining the communication deficiency of asking and providing data in autistic children is done through using social / pragmatic language. Pragmatic language consists of three elements: language use (various goals; such as greetings, commands, and facts), modifying language (depending on the listener's requirements), and obeying norms (i.e., maintaining the topic, turn taking, or use of facial eye contact and appropriate facial expressions). With social and communication difficulties as a basis, autistic children fail to achieve social interaction objectives via pragmatic language. Moreover, they have abnormalities in functional skills which are more significant than deficiencies in cognitive performance (Carpentieri & Morgan, 1996).

Children also have difficulty with asking and sharing information, as well as responding to queries (Kelley et al., 2006). Matson et al. (1993) investigated spontaneous speech. Autistic children often lack the capacity to react to verbal cues for everyday communication; hence, it is crucial to study communication skills for training children to be able to generate language. Recently, interest in spontaneous speech among autistic children has grown (Ingersoll et al., 2005; Kim et al., 2014; Blume et al., 2021; Broome et al., 2022). Researchers evaluated early communication abilities to acquire a better grasp of how natural communication happens in autistic children.

Individuals diagnosed with ASD are purportedly challenged in comprehending conversational inferences, metaphors, indirect speech, irony, as well as jokes (e.g., Happé, 1993; Surian, et al. 1996; Loukusa, et al. 2006; Paul & Cohen, 1985; MacKay & Shaw, 2005;

Ozonoff & Miller, 1996; Martin & McDonald, 2004). This important study's identification of a range of deficient pragmatic interpretations may give the idea that every component of speech analysis depending on context is troublesome for autistic individuals (Kim et al., 2014). Put differently, a cognitive characteristic specific to autism could influence pragmatic perception aspects consistently. Modern autism nomenclature reflects this notion of an all-encompassing pragmatic weakness in ASD. The Diagnostic and Statistical Manual of Mental Disorders (DSM-V) has incorporated a novel diagnostic criterion for ASD which pertains to challenges in comprehending non-literal language. Individuals may experience challenges in comprehending implicit information, such as drawing inferences, as well as interpreting non-literal or ambiguous speech, such as humor, idioms, metaphors, and context-dependent hidden meanings (American Psychiatric Association, 2013, p. 48).

The inability of autistic individuals to access the states of mind of others is a second clinical characteristic that emerged concurrently with studies on pragmatics in relation to autism. Whilst acknowledging the existence of significant inter-individual differences, it is noteworthy that the trait of autism has garnered robust empirical support across a diverse array of methodological approaches (e.g., Happé 1995; Joliffe and Baron-Cohen 1999; Yirmiya et al. 1998; Heavey et al. 2000; Senju et al. 2010). Presently, a widely accepted conception of pragmatic processing posits that it is inherently predicated on presumptions regarding the speaker's beliefs and intentions, commonly referred to as the 'Theory of Mind' (e.g., Sperber and Wilson 2002). Undoubtedly, the comprehensive cognitive interpretation of pragmatics poses considerable empirical challenges and is perceived by a substantial number of scholars as conceptually inadequate (Recanati 2004; Breheny 2006; Perkins 2007; Kissine 2012, 2013, 2016; Andrés-Roqueta and Katsos 2017). Despite this, it is still very prominent, particularly outside of linguistics. Therefore, this might have appeared logical to presume that inability to integrate the intention of the speaker as well as views would lead autistic individuals to wrongly

adhere to literal interpretations and not be able to join context with the process of interpretation (Baron-Cohen, 1992, 2000; Happé, 1995). A persistent collection of empirical evidence challenges this uniform pragmatic impairment notion, that is generated by a Theory of Mind impairment.

## **2.5 Theories in Pragmatics Deficits**

The aforementioned demonstration highlights the seriousness of the compromised pragmatic and social competencies linked to autism. Moreover, the review elucidates a unique picture: the disability affects specific social competencies (while sparing others) and nearly every pragmatic aptitude. What theoretical framework could explain the psychological mechanism that could potentially justify this kind of depiction? To answer this question, two potential theories will be discussed.

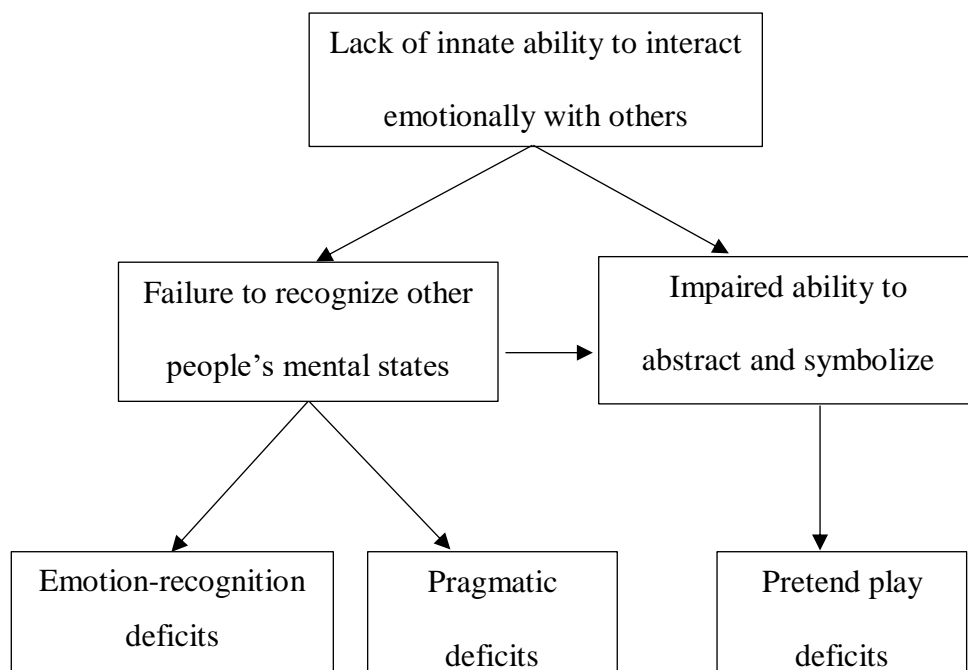
### **2.5.1 The Affective Theory**

Hobson stated in press that autism ought to be considered an irreducible impairment of affective and social relationships on several levels.

According to one view, autism's social and communicative difficulties are essentially affective. The proposition that autism is not a result of an emotional response to a traumatic experience should be distinguished from the notion that it is (Bettelheim, 1967; Tinbergen & Tinbergen, 1983). As per the Affective Theory, autism is distinguished by an inherent inability to participate in emotional interactions with individuals. Kanner (1943) first presented this theory, as the title of his article 'Autistic Disturbances of Affective Contact' indicates. Hobson (1983, 1986a, 1986b, in press) as well as Weeks and Hobson (1987) provided the most comprehensive account of this perspective in the work mentioned before.

Hobson outlined his own theory "Affective Theory" with four fundamental principles. It includes:

1. The fact children with autism exhibit limited inherent mechanisms of behavior and response that are essential for the establishment of interpersonal connections with others, including emotional bonds, is noteworthy;
2. The interpersonal exchanges are indispensable for the establishment of an individual and collective reality among individuals (Bosch, 1970, p. 115);
3. Autistic children have a lack of involvement in inter - subjective social activity. This latter has a particularly important consequences: (a) a comparative inability to recognise the fact that people are individuals with their own feelings, wishes, thoughts, intentions, and so forth., and (b) a serious deficit in the ability to generalise and to feel or think metaphorically; and
4. The majority of linguistic and cognitive deficiencies in autistic children may be attributed to low-order problems that are intimately related to social - emotional development, or deficits in the capacity to conceptualize in a social dependent manner. This posture is diagrammatically shown in Figure 05.



**Figure 6.** The Affective Theory according to Hobson (1987)

According to Hobson, Typical newborns are born to be sensible to and grasp the emotions of others. The aforementioned concept is grounded in the scholarly investigation of maternal and infant interaction, as carried out by Murray and Trevar (1985). Hobson asserted that this capacity is "beyond cognition." In reference to Hobson's theory, Butterworth (1986) reinforced this by stating, "the mind is transparent" (p. 20), i.e., the person's states of mind, such as their feelings, are "naturally" accessible to all of us. Some philosophers have claimed that biological prewiring is indeed the inquiry into the epistemological basis for ascertaining the existence of consciousness in other beings is a longstanding question. (Hamlyn, 1974). Consequently, Hobson postulated that the mental states of other individuals could be perceived "directly" through their physical manifestations, obviating the necessity for inference. He refers to this as "non-inferential (direct) empathy" (p. 12). Hobson postulated that the biological, non-cognitive prewiring towards perceiving the emotional states of another is dysfunctional in autism.

Hobson argues further that the infant's emotive interactions with others are directly responsible for the development of conceptual and symbolic role-taking abilities. In such relationships, the author posits that during the early stages of development, the neonate acquires an understanding of alternative conceptual frameworks and symbolic interpretations through exposure to the perspectives of others.

The pragmatic and social difficulties in ASD that are discussed before are how well explained by this account? Despite the fact that Hobson's studies (1986a, 1986b) on the understanding of autistic children for emotional expressions provide some guidance for this theory, it is ambiguous which element of those studies' inter-modal recognition tasks -including facial expressions, gestures, contexts, and vocalisations -was the cause of the studies' defeat. Langdeil (1981) determined that the evaluation of a singular form, such as facial expressions, gets assessed, the children's performance is still poor, but above the probability of a normal person. Hobson's (1986a) investigation indicated that 17 out of the 23 children with

autism would compare the facial expression with captured facial expression following a set of instructions. Furthermore, Hobson (1986b) documented that the children demonstrated the ability to correlate illustrations of movements with visual depictions of actions following some instructions. It was challenging because of their facial, gestural, and vocal, expressions which were not easy to match. There exists certain empirical evidence suggesting that autistic children can detect facial expressions but not necessarily selectively, according to a study by Weeks and Hobson's (1997)

As evidenced by Hobson's model, Axiom 3(a) posits that autism hinders cognitive role-taking (Baron-Cohen et al., 1985, 1986). Nevertheless, it is unclear why the model would make that claim, given that trouble comprehending feelings does not necessarily entail problems comprehending beliefs. And neither does the model explain typical acceptance of oneself functioning (Flannery, 1976; Neuman & Hill, 1978; Ferrari & Mathews, 1983; Spiker & Ricks, 1984; Dawson & McKissick, 1984; Baron-Cohen, 1985) or role-playing in one's mind (Baron-Cohen, 1985; Hobson, 1984). Moreover, the Affective theory does not explain the cause an attachment in autism may be unaffected to some extent (Sigman & Ungerer, 1984), the potential reasons behind the manifestation of social grin at 6 weeks of life in individuals with autism, as posited by Park (1983). Additionally, the underlying factors that may contribute to the affinity of autistic children towards rough-and-tumble game, as suggested by Damasio and Maurer (1978)

According to axiom 3(b), the incapacity to abstraction and symbolise is a direct result of a dysfunctional intrinsic ability to comprehend the emotional states of others. Hobson employed this proposition to account for the linguistic, abstract imitation (Curcio, 1978; Hammes & Langdell, 1981), and imaginative play (Baron-Cohen, 1987a; Ungerer & Sigman, 1981). Nevertheless, the process whereby the acquisition of a figurative capacity is fundamentally contingent upon various factors: "it depends upon the infant's experience of a world of shared

feelings and patterns of activity with others" (p. 14) as well as is "essentially affective-conative and/or social in origin" (p. 20). This necessitates significantly further clarity and scientific proof than is currently available.

### **2.5.2 The Meta-Representation Theory**

In contrast to the Affective Theory, the current passage provides a cognitive explanation for the social impairment observed in individuals with autism (Baron-Cohen et al., 1985). While there exist alternative cognitive explanations of autism (e.g., Hermelin & O'Connor, 1970; Boucher, 1981; Rutter, 1983), the present theory is commonly referred to as "the Cognitive Theory" in order to distinguish it from the "Affective Theory". The essential information is encapsulated in a graphical representation comprising five axioms, as illustrated in Figure 02.

Such as the preceding theory, Cognitive Theory believes the autistic child's inability to comprehend the mental states of others to be essential. In contrast to the "Affective Theory", however, this viewpoint begins with an assumption that "states of mind" are not immediately visible but must be inferred; this inference needs a complicated cognitive process, which will be discussed in the coming sections. Furthermore, the Cognitive Theory places a higher emphasis on the ability to infer mental states such as beliefs over emotions, as outlined for the following rationales: Desires and beliefs are widely regarded as fundamental cognitive states for comprehending the social world, given their causal influence on actions (Dennett, 1978). Moreover, their inherent content-driven nature establishes an ongoing association between desires and beliefs and the objects of their reference (e.g., "x" is believed by me, and "y" is believed by you). This "aboutness" is referred to as the Intentionality of mental states (Brentano, 1874). In contrast to states of mind such as desires and beliefs, emotional reactions (such as pleasure, sorrow, fear, and rage) may not always contain substance; hence, they may be less useful to predict and understanding social behaviour.

The capacity to assign states of mind with contents with others is referred to as a "Theory

of Mind" (Premack & Woodruff, 1978) since it includes postulations to the presence of states of mind and employing them to interpret and predict the behaviour of another individual. Dennett (1978) and others suggested that humans constantly employ "Folk Psychology" in order to comprehend the social reality (for instance, "someone will not speak to me since he thinks I do not like him")

The studies conducted by Wimmer and Perner (1983) and Hogrefe et al. (1986) revealed that children at the age of four were capable of attributing a false belief to another individual, which allowed them to predict their behavior accordingly (e.g., inferring that the person would search for the chocolate in the cabinet). Interestingly, children with Down's syndrome exhibited similar abilities in this regard (Baron-Cohen et al., 1985). In contrast, normal intelligence youngsters with autism exhibited an inability to differentiate their own beliefs from those of others. (Baron-Cohen et al., 1985; 1986). This is considered an impairment that is specific to autism, as others have verified (Dawson & Fernald, 1987).

As previously stated, it is believed that the inferential process involved in assigning states of mind such as beliefs requires sophisticated cognitive processes. Their foundation may be summed up as follows: Our conceptions or ideas about actual world are referred to as "basic/primary representation. Nevertheless, the views about the states of mind of other individuals (such as their desires and beliefs) are themselves representation of other representation. These are often referred to as "second-order representation" (Dennett, 1978; Johnson-Laird, 1983) or "meta-representation" (Leslie, 1987; Pylyshyn, 1978). The logical features of primary and meta-representations vary greatly (Leslie, 1978). According to the Cognitive view, autism is characterised by an inadequate ability for meta-representations.

Leslie (1987) describes how certain meta-representation may function to permit not just the identification of distinct ideas and aspirations to another individual, yet "pretend play" as well. In latter, the cognitive system should portray an item as both real as well as unreal

together. This topic is not directly related to pretend play, which is described in more detail somewhere else (Baron-Cohen, 1987a).

At what age one would typically anticipate the development of meta-representation? As neither capacity to assign distinct thoughts to another individual nor the capacity to pretend play (or represent) were firmly proved to be in the repertory of newborns at least until the ending of the first year of age. Available data shows that the capacity to pretend develops before the capacity to assign beliefs to others in typically developing youngsters (refer to Leslie's (1987) review for further examination).

How does the hypothesis explain the research on autism's impairments? The proposition posits that exclusively those social competencies that necessitate a meta-representational capability, such as theoretical role-taking, would result in impairment. The previous research supports this conclusion (Baron-Cohen et. al., 1985, 1986). Furthermore, absence of self-conscious response in autism mirror self-recognition experiments is accounted by an incapacity to see themselves as the subject of another's thought. Likewise, this argument may be expanded to the overall absence of shame in autism (Baron-Cohen, 1985). Autism's apparent difficulties in joint attention were explained by Mundy et al. (1986) using the Theory of Mind hypothesis. Researchers described this to be "a failure to develop an adequate concept of others as 'agents of contemplation' (Werner & Kaplan, 1963) who possess independent psychological states, such as interest in objects" (p. 667). Contrary, low-level imitation as well as mirror self-recognition need just primary representations, and their absence in autistic individuals is compatible with the Cognitive Theory. It also applies to sensory role-taking, that may be accomplished by mental rotation on fundamental representation.

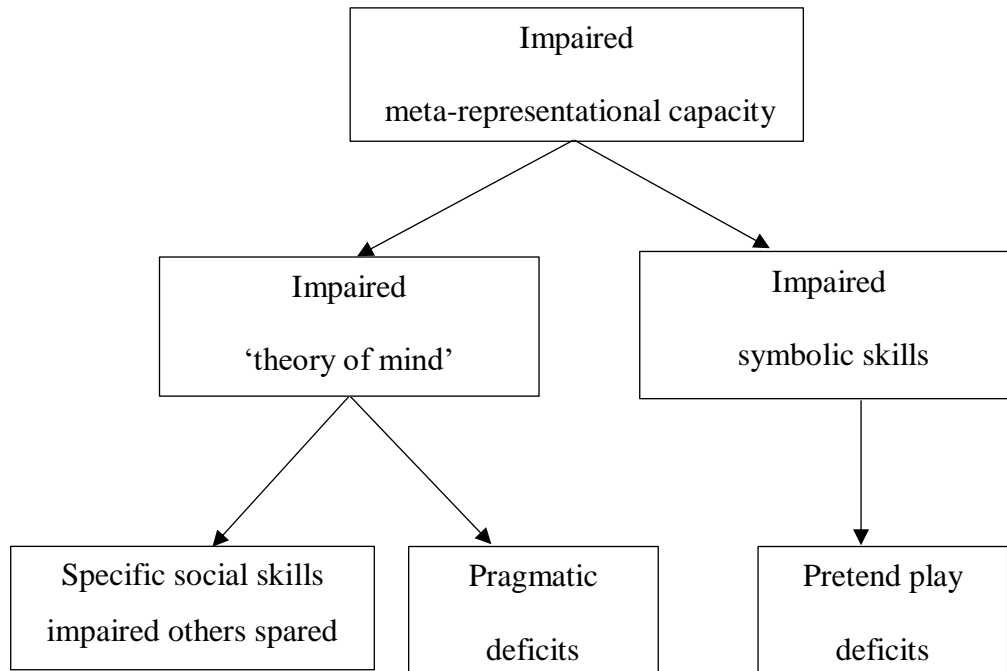
One weakness of Cognitive Theory seems to be the fact that the sole state of mind studied in autism to yet is belief, which is regarded a most basic (Wimmer & Perner, 1983). Other Intentional states, including know, think, intend, want, and so on, are now under examination.

Hence, it may be inappropriate to refer to the impairment in autism as a deficient Theory of Mind. Another deficiency of the Cognitive Theory is the fact that it does not explain Hobson's findings about emotional role-taking (Rutter, 1986).

Prior to examining the suitability of Cognitive Theory in addressing pragmatic impairments in individuals with autism, it is imperative to outline the theory's five fundamental tenets.

- Autism is brought on by core cognitive impairments
- One of these deficiencies is the inability to do meta-representations.
- Social skills that entail attributing mental states like desires and beliefs to the other persons (i.e., using Theory of Mind) need a meta-representational competence. Autism will consequently impede these social abilities, b. Autism may not impair social abilities that do not need a meta-representational ability.
- Symbolic talents need a meta-representational ability (e.g., pretend play).
- Almost all pragmatic talents involve an understanding of the mind (that itself demands a meta-representational ability). Consequently, they will likewise be damaged in autism.

This posture is diagrammatically shown in Figure 06.



**Figure 7.** The Cognitive -Meta Representation- Theory

The fifth Axiom argues that pragmatic abilities are likely to be affected for the identical reason like some social abilities, namely the inability to assign states of mind to others. There exist several explanations why one should consider the cognitive and emotional state of the recipient during communication in order to communicate in a socially acceptable manner. This consists of (In each instance, the mental state is italicized):

- a) The recipient of the message maintains specific cognitive constructs regarding the semantic referents of the lexicon employed by the communicator;
- b) The interlocutor endeavors to accurately convey the intended message of the speaker (Shatz, 1978); and
- c) The communicative act involves selective information sharing, whereby the speaker and listener exchange certain information while avoiding other information. The present discourse entails the speaker's utilization of what Bates (1976) has referred to as "psychological presuppositions"; and finally

- d) According to Baron-Cohen (1988), the listener maintains certain assumptions regarding the speaker's behavior, such as their ability to provide relevant, sincere, truthful, and informative communication, as proposed by Grice (1967, 1975).

This is what Grice referred to as the "Cooperative Principle" of communication, and he claimed that deviations from it supply extra (useful) data.

The Speech Act theory has been scrutinized in the realm of philosophy of language with regard to the correlation between state of mind and communications (Austin, 1962; Grice, 1957, 1967; Searle, 1965; Strawson, 1964, 1979), which was previously mentioned. The theory of Speech Act posits that in order for communication to be meaningful, it is necessary for speakers and listeners to take into account the mental states of each other. This is for a reason that the meaning of a speech is attributed to the intention of the speaker as a reference to something. In order to find meaning in speech, then, a listener must deduce the speaker's intention behind the choice of words, and to make a meaningful speech, the speaker should assess if the intended meaning of the utterances has been understood. Sperber and Wilson (1986) conducted a review and expansion of this hypothesis.

Consequently, according to "Speech Act theory", Theory of Mind is required for the meaningful and communicative use of language. Given that autistic children have deficient Theory of Mind, it is possible that they do not use language in a meaningful or communicative manner.

In conclusion, the Cognitive Theory hypothesises that the demonstrated pragmatic deficiencies in autism are consistent with the absence of a Theory of Mind in autistic children's language use. Furthermore, it is anticipated that specific social abilities, which necessitate the utilization of Theory of Mind and/or Meta-Representational proficiency, may be impaired, whereas other social aptitudes are expected to remain unimpaired.

Some assumptions may be drawn from the Cognitive Theory: Firstly, there must be

children with autism whose development has progressed normally up to the age at which meta-representational ability typically emerges (towards the end of year one). Secondly, the limited number of children with autism having the lowest degree of Theory of Mind will be less pragmatically damaged as compared to the majority of autistic children having no Theory of Mind. According to Baron-Cohen et al. (1985), this subset included a percentage of 20 of their sample.

## **2.6 Factors Affecting Pragmatic Development**

The pragmatic development of children may be influenced by a range of circumstances. Cultural background, socioeconomic status, disparities in age and gender, the setting, as well as the mean length of utterance (MLU) are among the most important considerations. It is clear from the sheer number and interplay of these variables just how difficult it is to research pragmatic development in depth. The following is a quick rundown of some of the elements that have been shown to have a significant impact on pragmatic development, particularly in children.

### **2.6.1 Cultural Differences**

It is widely assumed that children undergo cultural socialization through language acquisition from their parents, relatives, and peers prior to their formal education, as posited by Vigotsky (1978). The children may have a hard time making friends in the classroom on the assumption that he comes from a different cultural background than their classmates and instructors (Heath, 1982). In addition to that, the culture of the child as well as their social language conventions may vary from those of the listeners, resulting in misunderstandings of the messages meant to be transmitted by pragmatic statements or actions. An unfavourable attitude toward social language norms that are different from the norm of the listener may also occur (Taylor, 1973 cited in Kasambira 2008:17). These hypotheses agree with the notion that pragmatic skills are influenced by cultural factors.

### **2.6.2 Socio-economic Status (SES)**

According to researchers, children's pragmatic development can be subject to Socio-Economic Status (SES). Hart and Risely (1995, as cited in Kasambira, 2008:22) observed that pragmatic development is significantly impacted by SES disparities and that children's cackle is positively connected with SES when monitoring families of diverse socioeconomic status (including those receiving public assistance and belonging to the working class). Other researches, on the other hand, found no notable disparities in pragmatic competencies and language acquisition among youngsters from low SES as well as middle SES within a particular ethnic group.

### **2.6.3 Effects of Parents and Context**

The manner of parental involvement with their kids has the potential to influence the communication skills of the latter. According to Becker's (1994) assertion, parents provide indirect as well as direct pragmatic information in response to their children's pragmatic actions during interactions. This prompts the children to rely primarily on their cognitive abilities to develop appropriate pragmatic responses. This argues that practicing pragmatic skills with higher parental cognitive input may assist the development of more sophisticated pragmatic abilities in children. Becker's (1994) findings indicate that there may be a correlation between the quantity and length of parental contacts and individual variations observed across families.

Becker (1994) posits that the contextual factors surrounding parental interactions with their children may impact the child's pragmatic output, while the academic milieu and exposure to peers and educators may influence the child's language proficiency. When studying conversational participants, it is necessary to evaluate the interactional setting. This suggests that diverse conversational circumstances might be active as well as comprise a significant variable impacting the child's pragmatic abilities and development.

#### **2.6.4 Age**

As with other areas of language acquisition, pragmatic development as well as the amount of acquired abilities improve with age. Researchers in the field of developmental pragmatics have identified age-related differences in children's pragmatic behaviours. For instance, Ryder and Leinon (2003) found that question-answering abilities improve throughout time and that children's capacity to give sophisticated context data for their responses increases with age. Furthermore, Pellegrini et al. (1995) hypothesise that as children mature, they will violate maxims less often. An additional group of scholars investigated the advancement of pragmatic language abilities in adolescent individuals. The empirical evidence suggests that the process of language acquisition does not come to a stop in the later stages of childhood, which contradicts the previously held assumption. It has revealed that the rate of pragmatic development during adolescence is comparatively slower than that observed during the preschool period (Nippold, 2000 cited in Kasambira, 2008). Henceforth, the investigation pertaining to the developmental stages of pragmatic skills cannot be overlooked, given that significant developmental modifications have been observed in specific communication functions and practices across discrete age groups (Haslet, 1983).

The current research endeavor seeks to examine the age cohorts of autistic individuals, ranging from 5 to 17 years of age, in relation to the acquisition and refinement of various pragmatic competencies. The ultimate objective of this inquiry is to contribute to the existing body of empirical knowledge in the domain of autism research. The exploration of data pertaining to the valuable influence of age can prove to be highly valuable in delineating the gradual acquisition of pragmatic skills.

#### **2.6.5 Gender**

As with cultural background and age, it was acknowledged that gender influences the overall language development. Numerous research investigated gender being a variable that

influences the development of pragmatics. When it comes to pre-linguistic pragmatics, females demonstrate "pointing" sooner than boys. In addition, Butterworth and Morissette (1996) explored the development of gestures and words at a young age of many newborns throughout time. Researchers found that female girl acquired "pointing" abilities prior to boys and hypothesised that nonverbal pragmatic abilities vary between boys and girls. On another token, Haslett (1983) argues that while there is no substantial difference in the sorts of communication abilities displayed by gender, females acquire language strategies at an early stage as compared to boys and improve their pragmatic language skills to a greater level of complexity. Conversely, Loukusa et al. (2007) researched the development pragmatic language understanding of children and observed no differences in pragmatic development between males and females. A variety of findings on the influence of gender on the development of communicative competence have encouraged investigators to either manage the variable of gender by balanced samples or perform a study with just one gender.

The objective of this research, therefore, is to conduct a comprehensive investigation into the impact of gender disparities on the pragmatic behaviors of autistic children. The study aims to provide empirical evidence that either supports or refutes the notion that gender has a positive influence on the pragmatic behaviors of autistic children.

### **2.6.6 MLU**

By calculating the children's Mean Length Utterances, morphological development is assessed. Typically, 50 to 100 utterances are examined to make judgments on the children's entire output. Brown (1973) asserts that a children's MLU strongly correlates with their age. He asserts that by five years old, a youngster is able to employ the majority of English morphological variants. The sequence in which these variations are acquired reveals a cognition in action (i.e., a cognitive pattern), pragmatic, and social development. Language keeps evolving until young adulthood, indicating more complex uses of the word and, therefore, more

pragmatic abilities. Various researches attempt to determine the correlation between Mean Length of Utterance (MLU) and the pragmatic development of children. Whilst other research (Dale 1980; Carpenter & Strong, 1988) revealed a positive correlation across pragmatic and syntactic development, Alternative perspectives have given rise to the notion that the developmental trajectories of these two language components are distinct (Rollins, et al. cited in Ninio & Snow, 1999:15).

Limited scholarly attention has been directed towards the utilization of Mean Length of Utterance (MLU) as a potential marker for the advancement of pragmatic abilities. Hence, the objective of this research is to comprehensively assess the influence of Mean Length of Utterance (MLU) on the enhancement of pragmatic abilities in autistic children.

## **2.7 Pragmatic Competence is of Utmost Importance**

For children to become socially integrated in their community, grammatical proficiency is not enough. The ability to communicate effectively requires pragmatic competence, an essential part of language. As said by Naremore in 1985:

Language users must not only know how to construct grammatical sentences, but also how to take turn in a conversation, how and whether to request or command, and much more. The skills that make language users effective go far beyond their capacities to construct grammatical sentences. (P:67)

This concept is highly supported by developmental pragmatics researchers. Ninio and Snow (1999) comment that linguistic abilities may play a significant impact in children's social contact with other peers as well as acceptance by peers. Additionally, communicative competence assists second language learners in accessing information of their target language as well as creating a favourable impress on instructors and influential adults. At a young age, children engage more effectively with their caretakers and peers with good communication skills than with peers who are less receptive. Considering communicative competence being an

inherent aspect of social interaction, any deficiency in this area may forecast academic as well as social failure, especially assuming that the youngster is unresponsive to his instructor, that may result in academic fail (Kasambira, 2008). Thus, in the educational context, a students have to be effective communicators in order to transmit their intended meaning effectively, be comprehended, and grasp the teacher's conveyed intentions (Halliday 1975).

It is imperative that children are made accessible for inquiries in order to exhibit their adeptness in this pragmatic ability, that is assessed by instructors via tests. Teachers also watch and analyse how students utilise different communication skills, such as questioning, inference, and the use of acceptable conversational techniques (Ryder & Leinin, 2003). To aid educators and parents in assessing a child's communication ability, researchers should devote more time to determining how normally developing youngsters acquire pragmatic skills.

## **2.8 Previous Research on Pragmatic Impairment in Autism Spectrum Disorder**

Using a prognostic design in mainstream education, Ketelaars et al. (2010) performed research to clarify the occurrence and type of behavioral challenges in Pragmatic Linguistic Impairment (PLI) children. This methodology provides important insights into the broad link between PLI and a variety of behavioral issues. A sample of 1,364 four-year-old children was assessed by teachers who administered the Children's Communication Checklist (CCC) and the Strengths and Difficulties Questionnaire (SDQ), in addition to providing supplementary data. In the community sample, pragmatism is substantially connected with behavioral issues, according to the findings. Once pragmatic competence is taken into consideration, structural language skills are no longer predictive of behavioral issues. Frequently, children with pragmatic language impairment exhibit mostly externalising behavioral issues. Hyperactivity and lack of prosocial behavior, which reach clinical levels in this group, are the most significant issues. However, all issue levels are higher compared to youngsters with typical development.

In summary, young children with PLI have a broad range of behavioural issues. Early evaluation of pragmatic ability may facilitate the early identification of children at risk for behavioural issues. Due to the correlation between pragmatic competence, behavioural issues, and probable underlying diseases like as autism and ADHD, early examination of pragmatic competence may also serve as an early indicator for the diagnosis of autism or ADHD.

According to Reboul et al. (2012), ASD sufferers have poor social cognition and interaction. Patients with autism vary from those with Asperger syndrome in that they are more deficient in language throughout infancy, exhibiting either a significant delay in the acquisition of language or an inability learning the language. In maturity, however, individuals having high-functioning autism and Asperger are likely to reach a plateau regarding the matter of their verbal ability, at least in terms of their vocabulary of individuals belonging to both categories remains significantly beneath the lexical competence of typically developing individuals. In addition, ASD Individuals exhibit notable pragmatic challenges that seem to be somewhat dissociated from their level of linguistic proficiency: that is, Despite the verbal and high-functioning abilities of patients, pragmatic utterance analysis and the management of discourse continue to be prevalent issues and a significant contributor to communicative difficulties. This is particularly evident in conversational settings as opposed to experimental contexts. While it may seem that the challenges associated with language acquisition during early development and the pragmatic limitations observed in adulthood stem from a shared underlying cognitive impairment, the evidence supporting this notion remains inconclusive. It is evident that the pragmatic limitations observed in the adult population may have a more immediate association with deficits in theory of mind. Conversely, the challenges encountered during early developmental stages are more explicitly pertinent to basic social obstacles that could endure into adulthood. Notwithstanding, it should be noted that there exist associations between impairments and deficiencies in theory of mind in individuals with autism. As per the scholarly

work of Povinelli and Vonk (2004), the existence of theory of mind is contingent upon the ability to comprehend and interpret the actions of others, commonly referred to as "reading behaviour". Assuming that the capacity for behavior reading is compromised in autistic individuals, as indicated by the attentional deficits reported by Ceponiene et al. (2003) and the examination of mirror neurons in ASD children by Cattaneo et al. (2007), then the development of theory of mind may be hindered by insufficient or flawed inputs from this relatively basic cognitive process. Notwithstanding the distinctiveness of theory of mind and impairments in behavior reading, and their differential impact on language acquisition across developmental stages, it is plausible that the former is contingent upon the latter for its typical maturation. Both factors play a significant role in the advancement of social/pragmatic cognition and language communication.

Miller et al. (2015) assessed early pragmatic-linguistic abilities of preschool-aged relatives of autistic children and studied the correlation between pragmatic-linguistic deficits as well as general language issues, autism symptoms, and clinical outcomes. Respondents were younger siblings of autistic children (high-risk,  $n = 188$ ) or usual development (low-risk,  $n = 119$ ) who have been part of a retrospective study of newborns at risk for ASD; analyses included siblings without ASD outcomes. The Language Use Inventory was used to assess pragmatic language abilities (LUI). At 36 months, the high-risk subgroup had considerably worse pragmatic language scores as evaluated by parents than the low-risk group. 35 percent of those at high risk and 10 percent of those at low risk were determined to have pragmatic language impairment (PLI) based on LUI scores below the 10th percentile. Children with PLI had increased rates of general language impairment (16%), defined as total score underneath the centile on the Receptive or Expressive Language sub - scale of the Early Learning Mullen Scales, compared to children without PLI (3%), but the majority of children did not demonstrate general language impairments. Children with PLI exhibited substantially higher ADOS scores

and clinician-rated abnormal clinical best guess outcomes (49 percent) than children without PLI (15 percent). Some relatives of autistic children exhibit pragmatic language difficulties as early as the age of 36 months. As it is believed that the new DSM-5 diagnostic of Social (Pragmatic) Communication Disorder (SCD) occurs more commonly among family members of persons with ASD, it is probable that some of these siblings may fit the criteria for SCD as they age. Young children with a family predisposition for ASD should have their early pragmatization development closely monitored.

Parsons et al. (2017) said that autistic children need evidence-based therapies to reduce the psychological consequences of pragmatic language deficiencies on a lifetime basis. In a systematic review, they found 22 papers reflecting on 20 pragmatic language therapies for 0–18-year-old children with ASD. Each study's features, intervention components, and methodological rigour were evaluated. A meta-analysis was undertaken to evaluate the efficacy of fifteen therapies. The findings of the study revealed that active participation of the child - parent in the treatment was a key mediator of the intervention's effectiveness. Age, treatment setting, and modality did not serve as significant mediators between interventions and pragmatic language assessments. Largely unclear are the long-term benefits of these treatments and the transferability of learning to different situations. Implications for clinical treatment and future research areas are highlighted.

According to Deliens et al. (2018), autism is very often characterised by a consistent pragmatic deficit. Recent data reveals, however, that some aspects of pragmatic functioning are retained. This research aims to examine the degree to which contextual generation of non-linguistically conveyed meanings is operational in autism spectrum disorder. In two act-out pragmatic tasks, they compared the accomplishment of 24 autistic persons and compared neurotypical adults. The first assignment measures indirect request interpretation generation, and the second, ironic comprehension. In contrast to the ease with which indirect demands are

contextually understood, irony is notoriously difficult to grasp. These findings show that retained pragmatics in autism is confined to egocentric context processing that does not depend on inferences about the mental states of the speaker.

Autism is characterised by difficulties in social communication and interaction; thus, this is not surprising that autistic individuals have difficulty conversing. People with autism spectrum disorder's conversational abilities are being studied in a variety of contexts, including studies comparing their abilities to those of usually developing those and people with different impairments. An analysis based on these comparisons may reveal whether or not a certain diagnostic group is the only one with conversational deficiencies. Researchers from Ying-Sng et al. (2018) looked at research that included autistic individuals when it came to pragmatic components of dialogue. The research yielded a minimal number of reliable results. Autistic people have tough time maintaining concentration and presenting new, useful information. There were no significant differences in the way communications breakdown were healed or explained between couples, despite the fact that people tended to focus intently more during discussion and start and answer less. Eye gazing was found to be used in a variety of ways, with varying degrees of success. Fewer-than-expected disparities between groups were identified as a result of this study's results. Analysis was complicated by the research's fragmented structure and the different operational definitions of the variables assessed. Before drawing conclusions, additional investigation and replication of findings are needed.

Autistic individuals have a difficult time communicating pragmatically with their speech (ASD). Considering the importance of language in daily life, Oren et al. (2021) investigated the distinctive pragmatic character of early words in order to compare them to Typically Developing (TD) children at comparable lexical levels. Twenty-four pairs of mothers and toddlers took part (9 autistic children and 15 typically developing children). When toddlers had a productive vocabulary of 40–70 words, dyads were videotaped. This set of recordings was

made three times in a realistic setting and twice in a two-month period. Over 7,000 pieces of work were assessed and divided into four broad categories based on their intended message (Requests, Declaratives, Non-Communicative speech, and Objections,). There was a larger within-group variability in ASD toddlers' word development than in TD toddlers' (median 28 months, IQR 24.5–35, and average 17 months, IQR 17–18, respectively;  $p < 0.001$ ). Declarative was the most prevalent kind of communication in both groups. TD toddlers, on another token, had larger proportion of Declaratives than autistic toddlers across visits. Non-Communicative speech was employed more often by ASD toddlers than by their TD counterparts in both groups, whilst the observed distinction was noted, it did not attain statistical significance. Over time, the amount of non-communicative speech dropped. ASD children, in contrast to their TD counterparts, seem to have just a limited grasp on word function and progressively increase their ability to communicate as their vocabulary grows. For early intervention in autism spectrum disorder (ASD), these results have theoretical and practical consequences. Individual qualities and interaction style, we contend, have an impact on communicative profiles.

According to research by Cardillo et al. (2021), PL (pragmatic language) is defined as the capacity to communicate effectively via the use of language. Results from previous studies demonstrate that the communication profile of autism spectrum disorder suffers from PL impairments (ASD). Even though PL has been linked to both theory of mind (ToM) and executive capacities in autistic children, few studies have examined the connection between all these three domains and their findings have been inconsistent, according to the researchers' understanding. Our goal was to get a better understanding of how ToM and EF mediate PL in autistic children via this research. PL is a multidimensional concept with several facets. The capacity to understand and draw conclusions from nonliteral language and nonverbal cues were the primary emphasis of this investigation. After evaluating 143 people (including 73 people with ASD), we were able to establish that PL deficits are a common occurrence in autistic

people. In both ToM as well as EF, autistic children performed worse than normally developing peers. The only factor that had a substantial impact on the association among group and PL was ToM, even after accounting for the mediating effects of EF. In our discussion, we considered the relevance of treatments that aren't just focused on PL, and include ToM.

Autistic children and children with language impairment (LI) were studied in Wong et al. (2021) research on early pragmatic language abilities (ASD). Direct evaluation of early pragmatics in 266 TD children, 73 children with LI, and 16 autistic children was conducted. Children in two clinical subgroups had severe pragmatic language deficiencies, according to a post hoc examination. Children with ASD who were older showed difficulties equivalent to those of their LI classmates, indicating that pragmatic language abilities in autistic children had remained largely static. Results also showed that autistic children may detect pragmatic language deficiencies, which has implications for the use of this assessment technique in clinical settings.

## **Conclusion**

Pragmatic skills in children are developed and improved through engagement in families, with peers, and educational interrelations, that functions as a mechanism and encouragement to highly skilled and the use of language in a strategic manner. They know how and where to customise a variety of communication resources in specific discursive practices. The objective of research on pragmatic development is to establish and explicate the mechanisms by which children acquire the ability to employ language as an effective instrument for social interaction by exploring both culture-specific and universal elements of children's interactional abilities. The current chapter has presented an overview of pragmatics including different definitions and perspectives of this domain.

## Chapter Three

### Research Methodology and Procedures

Introduction.....	110
3.1 Research Design and Methodology.....	110
3.1.1 Case Study/ Longitudinal Study .....	111
3.1.1.1 Definition of case study .....	112
3.1.1.2 Design of case study .....	113
3.1.1.3 Category of case study.....	115
3.1.1.4 Longitudinal Case Study .....	117
3.1.1.5 Advantages of case study .....	118
3.1.3 Research Method.....	119
3.1.3.1 Quantitative Method of Research .....	122
3.1.3.2 Qualitative Method of Research .....	122
3.1.4 Research Tools and Instrumentation .....	123
3.1.4.1 Published Language Pragmatics Tests.....	124
3.1.4.2 Published Checklists or Profiles .....	126
3.1.4.3 Coding System of Naturalistic Assessment of Interaction.....	127
3.1.4.4 Assessment of Language Pragmatics Comprehension .....	131
3.1.5 Selecting an Evaluation Method .....	132
3.1.5.1 The Pragmatic Protocol by Prutting and Kirchner (1982) .....	133
3.1.5.1.1 Communicative Parameters Assessed Using the Pragmatic Protocol: Definitions .....	136
3.1.5.2 Language Sampling .....	143
3.1.5.2.1 Forms of Language Sampling .....	143
3.1.5.2.1.1 Free Play .....	144
3.1.5.2.1.2 Conversation .....	144
3.1.5.2.1.3 Narrative .....	145
3.1.5.3 Participants Observation.....	145
3.1.6 Statistical Instruments for Data Analysis .....	148
3.1.6.1 Frequency Distribution .....	148
3.1.6.2 Percentage Distribution.....	148
3.1.6.3 Mean .....	149
3.1.6.4 Standard Deviations .....	149
3.1.6.5 T-Test.....	149

3.1.6.6 F-Test .....	149
3.1.6.6 Pearson correlation Coefficients.....	150
3.1.7 Study Variables .....	151
3.1.7.1 Dependent Variables:.....	151
3.1.7.2 Independent Variables: .....	151
3.2 Population and Sample Description .....	153
3.2.1 Population Definition .....	153
3.2.2 Sample Definition .....	153
3.2.3 The eligibility criteria of the Sample.....	154
3.2.4 The Sampling Procedure .....	154
3.2.5 Sample Size for Case Study.....	155
3.2.6 Profiles of Autistic Children Participants.....	156
3.3 Data Collection Procedures.....	157
3.3.1 Steps Followed for Data Collection .....	158
Conclusion .....	158

## **Chapter Three**

### **Research Methodology and Procedures**

#### **Introduction**

This chapter consists of sections that describe the overall methodology adopted in this study. First of all, a section specifies the research design by describing the focus of this research. It highlights a comprehensive approach to the study in hand involving the research process, method, tools and instrumentations, as well as depicting the selection of different evaluation techniques in the study. Second, it represents data collection procedures by describing also data sampling process, together with the specific criteria involved in it. It illustrates the framework that guides data collection, and the data elicitation process adopted. Finally, it gives a demonstration of the statistical treatment selected to analyse the data and deals with the variables as well as data analysis procedure chosen in the present research.

#### **3.1 Research Design and Methodology**

Research design and research methodology are two key concepts that need to be defined in order to alleviate the uncertainty that sometimes accompanies their use, especially among novice researchers. The term research is coupled with the ideas of design and methodology to form a compound word. To begin addressing the question, "What is research?" one must first define it. Research has been defined through diverse means by researchers as well as scholars through diverse areas. It is defined in the Oxford Advanced Learners' Dictionary of Current English (1986) as "systematic investigation undertaken in order to discover new facts, get additional information" (p. 720).

Saunders et al. (2003) state that the goal of scientific investigation is to discover new information and expand one's body of knowledge. Research, according to the definitions given above, is a deliberate activity whose goal is to discover new information and facts about certain phenomena. To do research, one must first identify a specific problem, then convert it into a

research question, gather data, analyse these data, then report the results.

According to many researchers, a research design is the overarching approach for integrating the study's components into one cohesive whole. This is done to guarantee that the research question is adequately addressed. This helps researchers to pursue their voyage of discovery, however with a systematic process. In the same manner that an architect or an engineer chooses a design from a variety of techniques to see what kind of study should be conducted, a researcher does the same.

Research design is also defined as “a plan for a study, providing the overall framework for collecting data,” according to Leedy (1997, p. 195). To put it another way, MacMillan and Schumacher (2001, p. 166) state that research design is “a plan for selecting subjects, research sites, and data collection procedures to answer the research question(s)”. More evidence by them suggests that “...the goal of a sound research design is to provide results that are judged to be credible.” Designing research is a "strategic framework for action that serves as a bridge between research questions and the execution, or implementation of the research strategy.”, as according to Durrheim (2004, p. 29).

### **3.1.1 Case Study/Longitudinal**

Through accounts of previous studies, case study research permits the examination and comprehension of complicated subjects. The use of this study is deemed dependable, particularly in cases where a thorough and exhaustive investigation is imperative. The case study has been recognized as a valuable tool in various social science investigations, particularly when exploring linguistics (Duff, 1990), sociology (Grassel & Schirmer, 2006), education (Gulsecen & Kubat, 2006), as well as problems based on community (Johnson, 2006), including unemployment, drug addiction, illiteracy, and poverty, and so on, are addressed. Among the factors for the acknowledgment of the case study being a research procedure is that scholars were more interested with the inability of quantitative studies to

provide in-depth and comprehensive explanations of the behavioral and social issues under investigation. Using case study approaches, researchers may transcend quantitative statistical data and comprehend behavioural situations from the viewpoint of the actor. Case study will help explain both the procedure and consequence of a phenomena by thorough reconstruction, observation, and examination of the investigated examples by using both qualitative and quantitative methods (Tellis, 1997).

On the same token, literature from the past demonstrates the applicability of a case study technique in several fields and subjects. Among these are natural instances in the domains of Law (Lovell, 2004) as well as Medicine (Taylor & Berridge, 2006). Furthermore, the use of case studies has been extensively implemented across diverse disciplines, encompassing governmental sectors, education, as well as management. As an instance, research was done to ascertain the efficacy of specific government programs or the extent to which program objectives were achieved. In alternative settings, like evaluative applications and education were used to determine the efficacy of education programmes. In these sorts of studies, relying only on quantitative methods might mask certain crucial facts that must be unearthed.

### **3.1.1.1 Definition of Case Study**

Case study is a sort of research analysis and design described by Gall et al. (2003) as the "most widely used approach to qualitative research in education" (p. 433). This is as well-known as a "strategy" (Punch, 1998; Yin, 2003a), besides a research outcome: "The qualitative case study can be defined in terms of the process of actually carrying out the investigation, the unit of analysis (the bounded system, the case), or the end product" (Merriam, 1998, p. 34).

Various definitions indicate that case study emphasise the "constrained" and unique aspect of the case, the context significance, the accessibility of different data sources or viewpoints on observation, as well as the comprehensive and thorough of the research. Case

study research is defined by Gall et al. (2003) as "the in-depth study of instances of a phenomenon in its natural context and from the perspective of the participants involved in the phenomenon" (p. 436). Creswell (1998) and Merriam (1998) express it in a slightly different way: "A case study is an exploration of a "bounded system" or a case (or multiple cases) over time through detailed, in-depth data collection involving multiple sources of information rich in context" (as cited in Creswell, 1998, p. 61). "The qualitative case study can be defined as an intensive, holistic description and analysis of a single entity, phenomenon, or social unit. Case studies are particularistic, descriptive, and heuristic and rely heavily on inductive reasoning in handling multiple data sources" (Merriam, 1988, p. 16).

In the realm of psychology, Bromley (1986) provides a definition of case study as: the description and analysis of a particular entity (object, person, group, event, state, condition, process, or whatever). Such singular entities are usually natural occurrences with definable boundaries, although they exist and function within a context of surrounding circumstances. Such entities also exist over a short period of time relative to that context. (p. 8)

Several other definitions or characteristics of case study may be explored in Nunan (1992) as well as Merriam (1998). The important repeating aspects are in-depth investigation, boundedness or singularity, numerous views/ triangulations, contextualization, particularity, and interpretation. Case studies are not the same as case history, case method, or case work (Merriam, 1998). Despite the fact that these phrases have some similarities with case study, they are more strongly connected with medicine, business, and social work, correspondingly, where examples often play a more clinical or educational function than research one.

### **3.1.1.2 Design of Case Study**

Regarding the circumstances at hand, researchers may choose between a single case or

multiple case design. In situations when no additional examples are accessible for replicating, the researcher may use the single case design. To use a single case method, social research may be undertaken on the impacts of the tsunami in Aceh in 2004 or the Highland Towers collapse in Kuala-Lumpur in the 1990s. The disadvantage of a single-case approach is the deficiency in the capacity to create a generalizable conclusion, especially when the occurrences in question are uncommon. Triangulating the research using additional methodologies to ensure the 'validity' of the procedure is one way to address the issue.

The multiple case design is a viable approach for examining real-world scenarios that offer diverse evidence through replication, as opposed to sampling. Yin (1994) posited that the generalization of findings derived from single/multiple case study layouts is predicated on concept rather than population. Through the use of the 'pattern matching' technique, which involves the correlation of various pieces of evidence from a given case with a conceptual foundation (Campbell, 1975), the multiple case design serves to reinforce and authenticate previous discoveries. It enhances the degree of assurance in the reliability of the method. For instance, it is possible to extrapolate conclusive results from definitive findings. However, in the case of research conducted on dyslexic children and reading difficulties, it is imperative to replicate the study multiple times in order to establish a correlation with a theoretical framework.

Case study design must consequently be meticulous. The reason is the fact that a case study method must demonstrate that:

- It is the main feasible way for obtaining explicit and implicit data from participants,
- it bears relevance to the research inquiry,
- the adherence to a prescribed sequence of procedures with accurate implementation is paramount.,
- the case study method in social sciences is thoroughly complied to the scientific norms.,

- quantitative or qualitative "chain of evidence" is consistently achieved and documented, especially when observation and interviews by the investigator are the primary source of data,
- and there is a connection between the case study and the theoretical framework (Tellis, 1997).

### **3.1.1.3 Category of case study**

Case studies may fall into a variety of areas. Explanatory, descriptive, and exploratory case studies are listed by Yin (1984). Initially, exploratory case studies are devised to scrutinize any incidence within the data that the researcher deems interesting. Considering, for example, the broad issue of whether or not a student uses any methods when they read a book and how frequently this occurs in an exploratory case study. With these broad issues in mind, the groundwork for a more in-depth investigation of the topic at hand is provided. Research topics and hypotheses may be developed prior to doing fieldwork and collecting small-scale data collection in this instance as well. This preliminary effort serves as a foundation for the rest of the investigation. An exploratory case study, such as a pilot study, is critical in identifying the procedure to be followed (Yin, 1984; McDonough and McDonough, 1997).

Secondly, descriptive case studies illustrate the naturally occurring phenomena that happen within data, such as how a reader employs various methods. To achieve the researcher's objective, data must be described as they are collected. According to McDonough and McDonough (1997), a descriptive case study may be written in narrative style. Two journalists' descriptions of the Watergate affair are an instance of the descriptive case studies (Yin, 1984). Carrying out an in-depth case study, the researcher needs an in-depth theoretical framework to back up the findings. It is possible that the description will be lacking in rigour and difficulties may arise throughout the operation. Study of special education students by Pyecha (1988) illustrates descriptive case studies using a pattern-matching approach. Replication allowed

researchers to compare and generate hypotheses data which is collected from around the country. Descriptive theory was employed in this instance to investigate the case's breadth and depth.

Thirdly, explanatory case studies aim to analyze data at both surface and profound levels. to explain the phenomenon in the data. For example, in educational fields, a scholar may seek to investigate the rationale behind a learner's utilization of an inferential methodology during the process of reading. (Zaidah, 2003). According to the facts, a researcher might then construct a hypothesis and start out to test it (McDonough & McDonough, 1997). Moreover, explanatory examples are utilized for causal inquiries, wherein the technique of 'pattern-matching' may be employed to investigate a specific phenomenon within a complex and multidimensional framework. According to Yin and Moore (1987), these complicated and multidimensional instances may be described by three distinct theoretical frameworks are in competition with one another: 'problem-solving' theory, 'knowledge-driven' theory, and 'social interaction' theory. The problem-solving theory has similar characteristics as the knowledge driven theory. However, according to this view, products are derived from outside factors origins rather than scholarly inquiry. According to the knowledge-driven paradigm, commercial products are the result of fundamental research that leads to innovations and inventions. The hypothesis of social interaction posits that there exists a regular connection between researchers and consumers, which is facilitated by their shared professional connections.

Various scholars have also mentioned other types of case studies. McDonough and McDonough (1997) posited supplementary classifications of case studies, namely Evaluative and Interpretative case studies. When performing evaluative case studies, the researcher incorporates their subjective perspective into the observed phenomena within the dataset. However, through an interpretive case study, the researcher endeavors to construct a conceptual framework that either corroborates or challenges the presumptions made about the phenomena.

Yin (1984) encourages scholars against separating these classifications or perceiving them as a hierarchical structure. Yin (1984, p. 15) hypothesises:

A common misconception is that the various research strategies should be arrayed hierarchically. Thus, we were once taught to believe that case studies were appropriate for the exploratory phase of an investigation that surveys and histories were appropriate for the descriptive phase, and that experiments were the only way of doing exploratory or causal inquiries.

Nevertheless, the hierarchical viewpoint is imprecise. Research endeavors with an exploratory purpose have been in existence for several decades. Additionally, the construction of causal interpretations is a fundamental preoccupation of historiographers for a long time, as shown by the discipline recognized as 'historiography'. In summation, it can be posited that case studies serve a purpose beyond mere exploration.

Stake (1995) delineates three primary categories of case studies within his conceptualization: Instrumental, Collective, and Intrinsic. Undertaking an instrumental case study, a scholar opts for a restricted sample of participants to investigate a specific behavioral trend, such as the approach adopted by college students in preparing for assessments. In another context, a researcher may undertake a collective case study, wherein information is systematically gathered from multiple sources, including educational institutions and individuals. In opposition to intrinsic case studies, which endeavor to address the idiosyncratic concerns of an independent occurrence, collective and instrumental case studies may afford the possibility of extrapolating findings to a larger population.

#### **3.1.1.4 Longitudinal Case Study**

Instances of cases in the field of linguistics studies have traditionally been concerned with language learning in educational or non-educational contexts. In addition to carrying out research that records the knowledge of learners, skills, or performances at a single period in

time, researchers may also examine learners' behaviour synchronically (at one instant) and thereafter compare it with behaviour seen at a single or more following or earlier periods in time i.e., diachronically. The longitudinal case study, for instance the current study, evaluates performance and development across time. In such cases, information is gathered at periodic intervals; often, but not always, over the period of a year or more (Saldana, 2003).

Thus, the current research is categorised as 'an instrumental case study' since it examines a particular population, namely verbal autistic children belonging to a specific centre in Batna, and gives a broad knowledge of the autism phenomenon in connection to developmental pragmatics. This study's approach spanned a period of about one year and was based on observations that were duplicated eight months after the first observation was conducted. In this instance, the study is categorised as a 'longitudinal instrumental case study'.

### **3.1.1.5 Advantages of a case study**

Employing a case study provides a variety of advantages. Initially, the evaluation of the information is frequently undertaken through the framework of its application (Yin, 1984), specifically, within an environment where the activity takes place. For instance, a case study can be concerned in the method through which a person comprehends an actual text. To investigate the reading methods used, the researcher must watch the participant in their natural context, such as in the classroom or when reading for pleasure. This might be in contrast to, say, an experiment, which isolates phenomena from their environment and focuses on restricted variables (Zaidah, 2003).

Secondly, changes in instrumental, intrinsic, and collective methods to case studies permit simultaneous qualitative and quantitative data analysis. Certain 'longitudinal studies' of individual participants, for example, depend on qualitative data through articles that include behavioural descriptions. On another token, there are a couple of instances of case studies that investigate the facts from the quantitative and qualitative responses of particular respondents

(for instance, Block, 1986; Hosenfeld, 1984). Whilst Yin (1984, p.25) encourages investigators against conflating qualitative research with case studies, The author underscores the possibility of case studies being solely grounded on quantitative data.

Additionally, the elaborate qualitative reports frequently provided in a case study, serve not only to assist to examine or depict data within a practical environment, yet they also aid to explain the complications of real-world circumstances that might not be represented by survey or experimental research. A case study concerned with reading strategies employed by a single participant, for example, may provide access not just to quantitative values on the employed strategies, but also to the rationale for strategy usage and the relationship between strategies. As reading behaviours entail cognitively demanding processes, every reading strategy must be analysed in connection to the other strategy (Zaidah, 2003).

### **3.1.2 Research Method**

The current study employs a Hybrid research method. Kemper et al. (2003) describe mixed - method approach as a method that parallels the collecting and analysis of quantitative and qualitative data (Two types of data are gathered concurrently and analysed sequentially in a concurrent mixed method design). This method is defined by Bazeley (2003) as using mixed data (textual and numerical) and alternate tools (analysis and statistics). It is a sort of research wherein a mixed-methods research design, utilizing both qualitative and quantitative research paradigms in distinct phases.

As posited by Johnson and Onwuegbuzie (2004, p. 1), "mixed methods research is a natural complement to using either of the traditional qualitative or quantitative research methods in isolation." The category of research that involves the integration of both quantitative and qualitative research methods is widely acknowledged. Mixed-method research, according to Johnson and Onwuegbuzie (2004), is a "third wave" or third movement of research which transcends frameworks warfare by providing a practical as well as logical alternatives.

Creswell et al. (2004, p. 7) contend that "mixed methods research is more than simply collecting both qualitative and quantitative data; it implies that data are integrated, related, or mixed at some stage of the research process". In addition, they explain that a rationale underpinning mixing methods is rooted in the inadequacy of singularly employing either quantitative or qualitative research methodologies to comprehensively capture the complex patterns inherent in a given situation. When combined, quantitative and qualitative data provide a more thorough study, and they support one another. Johnson and Onwuegbuzi (2004, p. 17) posit that in the pursuit of the same argument regarding the rationale behind mixed-methods, it is imperative to consider that "mixed methods research includes the use of induction which refers to the discovery of patterns, deduction which involves testing theories and hypotheses, and abduction which refers to uncovering and relying on the best set of explanations for understanding one's results."

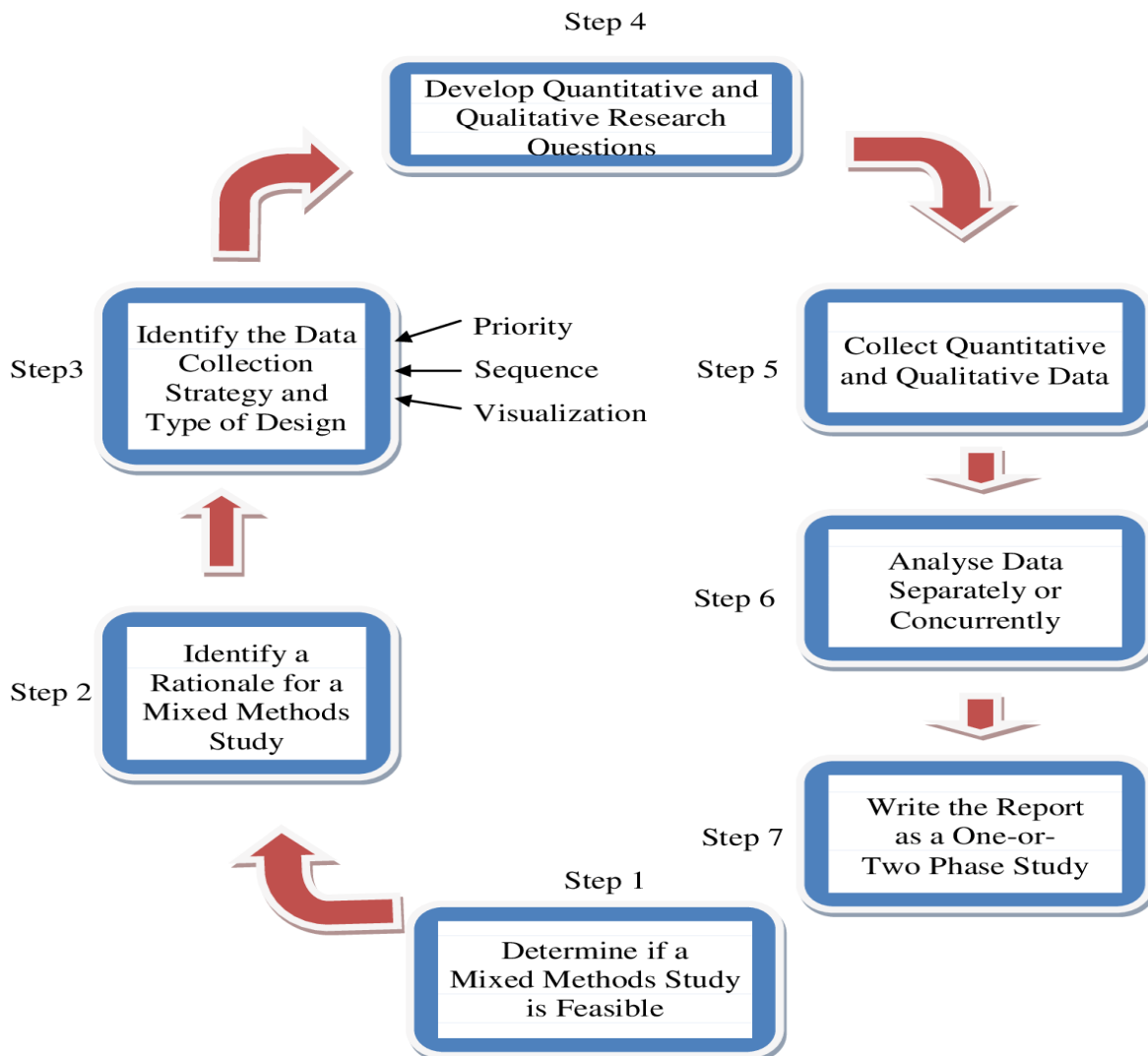
Numerous reasons for combining quantitative and qualitative research methods are present. Sale et al. (2002, p. 46) provide the following commentary about the integration of both methods:

Both approaches can be combined because they share the goal of understanding the world in which we live. They share a unified logic, and the same rules of inference apply to both. A combination of both approaches provides a variety of perspectives from which a particular phenomenon can be studied and they share a common commitment to understanding and improving the human condition, a common goal of disseminating knowledge for practical use. Both approaches provide for cross-validation or triangulation- combining two or more theories or sources of data to study the same phenomena in order to gain a more complete understanding of that phenomenon (interdependence of research methods) and they also provide for the achievement of complementary results by using the

strengths of one method to enhance the other (independence of research methods).

Supporting Sale et al. (2002), Onwuegbuzie and Leech (2006, p. 479) list "participant enrichment, instrument fidelity, treatment integrity, and significance enhancement" as justifications for combining quantitative and qualitative methods.

The figure below depicts the stages involved in performing a mixed-methods research:



**Figure 8.** Steps in the Process of Conducting a Mixed-Method Study (Adapted from Cannon, 2004)

The seven constituent components depicted in the aforementioned diagram have been duly noted and observed throughout the design phase of the present research endeavor. In this

investigation, the researcher has adopted an approach that views diverse research methodologies not as belonging to an irreconcilable qualitative/quantitative dichotomy, but rather as complimentary research methods. This approach has led to a more comprehensive understanding of the phenomenon being studied, as evidenced by the work of Egri and Herman (2000). The section that follows describes in depth the quantitative and qualitative research methods used in this investigation.

### **3.1.2.1 Quantitative Research Method**

Van der Merwe (1996) state that quantitative research is a method for testing hypotheses, establishing facts, revealing correlations between variables, as well as predicting results. Quantitative research employs techniques derived from fundamental sciences that are intended to promote objectivity, reliability, and generalizability (Weinreich, 2009). Creswell (2014, p. 33) also states that the quantitative method is “an approach for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures.”

The objective of quantitative research method, in the current research, is to evaluate the progression of different pragmatic-communicative abilities in relation to autistic children. This will be accomplished through the examination of 30 pragmatic indicators, which have been classified into three distinct categories: verbal acts, paralinguistic elements, and non-verbal ones. The findings have been succinctly presented in tabular format. The outcomes may also exhibit descriptive, analytical, and affirmative characteristics.

### **3.1.2.2 Qualitative Research Method**

Patton (2001, p. 39), in agreement with (Denzin & Lincoln 2005), defines a qualitative study as:

an approach that uses a naturalistic approach which seeks to understand phenomena in context-specific settings, such as real-world settings, where the

researcher does not attempt to manipulate the phenomena of interest...it is any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification, but instead the kind of research that produces findings derived at from real-world settings where the phenomena of interest unfold naturally.

Quantitative research starts with theories and hypotheses, using formal tools like surveys/questionnaires, protocols (as in the current research), and reduces information to numerical values. In contrast, qualitative research concludes grounded theory and hypotheses and makes little use of numerical values. As stated by the assumptions, the researcher's function in quantitative research is that of a detached observer. In qualitative research, on the other hand, the researcher is identified with the topic being investigated in its whole. Using a qualitative method, this study aimed to investigate the reasons for the disparities in pragmatic development among autistic children.

### **3.1.3 Research Tools and Instrumentation**

To evaluate the children's linguistic abilities development, the researcher must offer a full account of the children's communicative skills by applying the necessary informal checklists/observation and formal instruments. Nevertheless, it turns out that evaluating pragmatic language is significantly more difficult than anticipated. The understanding of development standards is limited, and researchers have been unable to pinpoint the exact age at which pragmatic skills emerge. In addition to that, pragmatic development is frequently influenced by individual characteristics and changes based on audiences and settings. Consequently, according to Adams (2002), pragmatic evaluation differs significantly from conventional language assessment techniques, and developmental standards could only be obtained from a single administration of standardised tests, i.e., on a single occasion.

Extensive efforts have been made to establish a complete measure that encompasses all

elements of pragmatic development; nevertheless, because to the intricate interplay of linguistic, social, cognitive, and cultural effects on pragmatics, this has remained challenging.

Therefore, researchers came to an agreement that evaluation instruments should be split into four broad categories (as cited in Adams, 2002, p. 976):

- Published Language Pragmatics Tests,
- Published Checklists/Profiles,
- Coding System of Naturalistic Assessment of Interaction,
- Assessment Language Pragmatics Comprehension.

### **3.1.3.1 Published Language Pragmatics Tests**

Published Tests of Language Pragmatics give the benefit of comparing the individuals' performance to that of a larger group and are simple and quick to administer. They are standardised assessments which have pragmatic components but are not entirely pragmatic. These assessments include subsets for inferential interpretation and comprehension of non-literal communication (Adams, 2002, p. 977). The Test of Pragmatic Language (ToPL) is considered to be the sole test that evaluates purely language pragmatics. It is often used with youngsters between the ages of 6 and 11. The objective of the ToPL is to "to provide an in-depth screening of the effectiveness and appropriateness of student's pragmatic skills" (Robinson, 2008, p.1). This evaluation relies on two factors: 'context and message'. Two elements comprise the 'context' component: the physical environment and the audience. The 'message' component contains a topic (introduction, selection, maintenance, and change) as well as a purpose (information requests, queries, and device organisation) (Phelps, et al., 1992, pp. 5-11). The ToPL test is not considered to be thorough to analyse different pragmatic aspect, since it focuses merely on few of them. Other tests; the Assessment of Comprehension and Expression (ACE), Test of Language Competence – Expanded (TLC), The Listening Skills Test (LIST), and Understanding Ambiguity (Adams et al., 2001), are not

purely pragmatic, but include subtests that evaluate pragmatic aspects in child language. Due to the fact that pragmatics is viewed as an assemblage of behaviors that are contingent upon contextual factors, the 'reliability' of applying this set of pragmatic language tests to recreate these behaviours is frequently called into question. Therefore, these tests are unlikely to be adequate and must always be complemented by elicitation techniques and extensive observation. The following table summarises these tests:

**Table 1**

*Formal Tests with Pragmatic Content, (Adams, 2002: 973)*

<b>Test Label</b>	<b>Author(s) and Year</b>	<b>Individual Ages</b>	<b>Method</b>	<b>Targeted Pragmatic Aspect(s)</b>
Assessment of Comprehension and Expression (ACE)	Adams et al., 2001	06-11	Subtests that utilise images a narrative with images	Analogical thinking Narratives Understanding through inference Recognizing vagueness Message assessment
Listening Skill Test (LIST)	Lloyd et al., 2001	03-06 06-11	Visual and verbal tasks	Understanding of orientations Evaluation of spoken messages Recognizing vagueness
Test of Language Competence Expanded (TLC)	Wiig and Secord, 1989	05-18	Inferences and interpretation of spoken words	Making deductions Comprehending metaphor(s)
Test of Pragmatic Language (ToPL)	Phelps-Terasaki and Phelps-Gunn, 1992	05-13	The social background of each of 44 items and images is established. Identification of images and taped messages as well as facial expression photograph	Physical surroundings Listeners Subject related speech act(s) Context-dependently multiple meanings
Understanding Ambiguity	Rinaldi, 1996	08-13		Disjointed expressions of feeling

### **3.1.3.2 Published Checklists or Profiles**

They are considered to be more widespread and comprehensive than other testing. Prutting's Pragmatic Protocol is among the most prominent works in the examination of language pragmatics. It was created in 1982 by Prutting and Kirchner then published in 1983. This protocol is descriptive including 30 pragmatic components (as an example: Topic selection, change, maintenance in addition to various speech acts). Using a checklist, these elements are graded based on their usage: employed correctly (appropriate), improperly (inappropriate), or not employed (not observed). It attempts to examine all of the verbal, paralinguistic, non-verbal components of different pragmatic skills. Another test is the The Children's Communication Checklist (CCC) is a standardized assessment tool used to evaluate the communication abilities of children. It is commonly utilized in clinical and research settings to identify potential communication disorders and to monitor progress in treatment. The CCC consists of a series of questions that assess a child's communication skills across a range of domains, including vocabulary, grammar, pragmatics, and social communication. The results of the CCC can provide valuable insights into a child's communication strengths and weaknesses, and can inform the development of targeted interventions to support their communication development. The measure comprises 70 items that are systematically organised into 9 distinct scales. The outcome of this measure is a compound pragmatic language score. This well validated description is supported by data from a control group with typically developing children (Adams, 2002, p.976). Contrary to certain other checklists/ profiles, the Children's Communication Checklist is quite straightforward to implement. It is offered to caregivers and parents and readily identify difficult-to-assess behaviours using language sample; however, it does not attain the objective of this study. The remaining tests are not extensively used. Following is a listing of the most frequent checklists/ profiles:

**Table 2**

*Common Pragmatic Checklists and Related Evaluations, (Adams, 2002: 975)*

<b>Test Name</b>	<b>Author(s) and Date</b>	<b>Coverage</b>	<b>Objective(s) and Method(s)</b>
Assessment of Language Impaired Children's Conversations (ALICC)	Bishop et al., 2000 Bishop and Adams, 1989	Exchange framework, Repair, Multiblock turns, and Mesh	Categorization of elements of conversational behaviour Quantitative
Children's Communication Checklist	Bishop, 1998	Pragmatic rating scale	Existence of pragmatics language disability
Linguistic Procedures Checklist for Directing Discourse	Blank and Marquis, 1992	Probing inquiries and directions	Information regarding the capacity to construct explanations
Pragmatics Profile of Children's Communication Abilities	Dewart and Summers, 1997	Conversational intention	A practitioner distributes a questionnaire to parents/guardians Interpretative
Pragmatic Protocol	Prutting and Kirchner, 1982	Verbal, Paralinguistic, and Non-verbal aspects	A total of 30 items were evaluated using a 3-point rating scale.
System for Social Interactive Coding	Rice et al., 1990	The codification of answers, Initiation, and Ignorance of speech act(s)	Observation of a videotaped exchange
Social Use of Language Program	Rinaldi, 2001	Graph of pragmatic attributes	Utilization of interaction in social settings

### **3.1.3.3 Coding System(s) of Naturalistic Assessment of Interaction**

The evaluation of communication intentions in early age is supported by observational previous research that constitute a developmental trajectory of activity (Halliday, 1975; Carpenter and Strong, 1988). Naturalistic evaluation is predicated on the coding of human behaviour and is generally used in works of socio-psychology. The pragmatic aspect of communicative intentions stands out as one of the limited elements of language pragmatics that

boasts a firm basis in both observational and developmental research (Adams, 2002, p. 977). Unquestionably, communicative intent assessments are among the most commonly and often utilised forms of coding systems for evaluating preschoolers. Klecan-aker and Swank (1988) introduced a methodology for classifying communicative behaviours and suggested that interpreting children's communications is the most relevant technique to analysing purpose in situations when communication is severely restricted. However, in the evaluation of pragmatics of language in older children, speech act measurement has been used to reflect the children's mastery of communicative functions as well as the application in various settings. Greeting, request, question, command, denial, and closure are typical speech acts addressed by this sort of coding system. Furthermore, evaluation using naturalistic observation is common and more predestined than straightforward elicitation techniques since it mimics ordinary contextual functioning, although it may be quite time demanding (Adams 2002).

Creaghead's Testing Protocol, also recognised as the peanut butter protocol, was therefore designed to analyze the children's pragmatic development. Creaghead (1984) argued that 'spontaneous language sampling' does not constantly provide a clear overview of the development of certain communicative skills. Creaghead designed a format of two tests that assessed Twenty-Five (25) communicative skills of 3- to 5-year-olds. Through her evaluation technique, she studied the development of communicative intents and conversational strategies demonstrated by children operating at language levels by taking into account the child's MLU. Her technique offered pragmatic motivation and referential support for the language functions and forms to be developed, hence raising the probability that such functions and skills would be evaluated. These are founded on concrete behaviours and can achieve high levels of dependability. The table below summarises the measures:

**Table 3**

*Systematic Coding for the Evaluation of Social Interaction*

Coding System Types	Function	Method
<b>Communicative intent:</b> the intent or anticipated outcome of the communicative act.	The implementation of communicative purpose frameworks has been observed in various research endeavors and is widely regarded as one of the prevalent coding systems employed for pre-school children.	The evaluation of communicative intent during the early stages of development is grounded in longitudinal observational research, which amalgamates the developmental contributions of Bates, Begnini, Bretherton, Camaioni, and Volterra (1979), Coggins and Carpenter (1981), Dore (1979), and Halliday (1979). (1975).
<b>Speech acts:</b> the act that is carried out by speech.	In the examination of language pragmatics with older children, speech act analysis has been used to assess the child's use of communicative functions in a variety of situations and to identify how the acts are utilised in particular circumstances. Typically assessed speech acts include request, command, question (or information request), challenging, deny, statements, negation, and greetings.	Fey (1986) presents a coding framework that categorizes speech acts into three distinct types: requestives (encompassing information requests, action requests, and clarification requests), assertive acts (encompassing comments, assertions, and disagreements), and performatives (encompassing teasing and exclamations). This methodology confers the benefit of enabling the classification of the juvenile as either an assertive or uncommunicative interlocutor, for instance.
<b>Responsiveness and initiation:</b> exchange structure.	Initiation and answer have been used in research to evaluate the talkativeness and attentiveness of children with communicative disorders.	The assessments of conversational dominance serve as a valuable tool for practitioners to not only scrutinize problematic techniques or behaviors, such as non-response, but also to reveal challenges pertaining to responsiveness in both verbal and non-

**Repairs:** Collection of behaviours designed to repair interactions in which information was missing, the message was poorly intended, or was misunderstood due to external circumstances such as noise.

**Turn Taking:** The phenomenon under consideration pertains to the discernment and amalgamation of a series of cues (namely, linguistic, prosodic, visual, and non-verbal) by individuals, which serve as indicators of a speaker's intention to discontinue their speech.

**Cohesion:** a collection of linguistic strategies that establish connections between diverse utterances in an exchange.

**Topic:** “a clause or noun phrase that identifies the question of immediate concern and that provides a

Children with particular language difficulties were more likely to leave inappropriate statements uncorrected than their classmates of the same language and age. These behaviours must be evaluated in naturalistic settings.

Children with responsive language difficulties tend to be more prone to turn-taking conflicts than those with expressive language difficulties alone. These issues may also depend on monitoring interactional comprehension.

The employment of cohesive devices enables the interlocutor to draw a sequence of inferences and minimizes redundancy in communication. To interpret or employ cohesive devices, interlocutors must possess shared and mutual knowledge, indicating that cohesion has a strong cognitive dimension.

Analysis of the topic evaluates whether each utterance: 1) has information; 2) is relevant to

verbal domains. Observation and classification of repairs is a crucial indicator of how troublesome the interaction is from both parties' perspectives. A system for classifying breakdowns in dialogues (Breakdown Coding System) with young children, as reported by Yont, Howard, and Miccio (2000), has great potential for a targeted assessment of repair strategies.

The evaluation of turn-taking proficiency is expected to be redundant, except for the purpose of devising and supervising interventions for individuals exhibiting significant challenges in this domain.

There is a lack of documented assessments of cohesiveness. Scholarly research has developed uncomplicated assessment frameworks, including: 1- the retrieval of referents from the linguistic context (anaphora = backward reference and cataphora = forward reference); 2- the retrieval of referents (exophoric reference); 3- ambiguous or irretrievable referents (Adams & Bishop, 1989).

The greatest source for evaluating topic is Brinton and Fujiki's (1989) study, which gives a checklist of

---

<p>global description of the content of a sequence or utterance” Mentis and Prutting, (1991) as quoted in Adams (2002, p. 978)</p>	<p>the overall topic; 3) maintains or adds a new subtopic; or 4) contains no new information. 5- is a side series (not contributing to subject upkeep but not a completely different issue); 6- is troublesome (ambiguous, unrelated, or incomplete information). In studies, it is common to evaluate whether events are recounted logically and with sufficient references for the interlocutor to maintain the "thread." There are indications of redundancy, topic shifting, lack of explanation, and removal of events in sequences.</p>	<p>topic administration and an analysis of subject's development and variability. Usual evaluation criteria include topic initiation, topic maintenance, topic shifting, topic chains (in which themes are connected), topic recycling (in which prior topics are reused), and topic reintroduction.</p>
<p><b>Coherence:</b> relates to how a theme is incorporated into conversations or interactions.</p>		<p>Coherence assessment offers the potential to solve pragmatic issues in older speaking children.</p>

### 3.1.3.4 Assessment Language Pragmatics Comprehension

The language context ought to be understood by the child for language comprehension to occur. Specifically, in instances where linguistic comprehension or socio-cognitive constraints impose limitations on language. (Leinonen & Letts 1987; Weismer, 1985, as cited in, Adams, 2002). In this context, the assessment of inference, reference, and non-literal language as components of the pragmatics of language is based on discrete criteria. The table presented below provides comprehensive details:

**Table 4**

*Related Measures of Pragmatics Comprehension, (Adams, 2002:980)*

<b>Pragmatic Aspects</b>	<b>Function</b>	<b>Measure</b>	<b>Author</b>	<b>Method</b>
<p><b>Reference:</b> the appropriateness of referencing communication between a speaker and a listener</p>	<p>The child must provide instruction or description to an individual who has difficulty seeing the object.</p>	<p>The Listening Skills Test</p>	<p>Lloyd, et al., 2001</p>	<p>Incorporates message evaluation and ambiguity detection in a child-friendly format and gives (UK)</p>
		<p>The Test of Language Competence</p>	<p>Wiig and Secord, 1989</p>	

				standards
				Also tests comprehension of confusing language
<b>Inference:</b> Verbal Inference	"Fill in" information which is not explicitly offered to facilitate text comprehension or discourse' overall organisation.	Test of Language Competence  The Inferential Comprehension Subtest of the ACE 6–11 Test	Wiig and Secord, 1989  Adams et al., 2001	Using narrative or image settings accompanied by inquiry to elicit inferences.
		The Test of Problem Solving Understanding Ambiguity	Bowers et al., 1994  Rinaldi, 1996	
<b>Non-literal Comprehension:</b> interpretation of obscure or idiomatic language	Centred on the comprehension of "traditional" idioms that must be decoded by context and/or common knowledge. Examples are "It's raining cats and dogs" and "He broke the ice" (Vance & Wells, 1994).	The Understanding Metaphoric Expressions Subtest of the Test of Language Competence  The Non-literal Comprehension subtest of ACE (6–11)	Wiig and Secord, 1989  Adams et al., 2001	The children must select an explanation of a statement involving a metaphorical usage of a phrasal verb, like "went off" (as in "The phone went off in her purse").

### 3.1.4 Selecting an Evaluation Method

Speech language pathology has a significant and complicated task when assessing pragmatic skills. Owing to the sensitivity of pragmatics, it is challenging to create a standardised assessment that reflects the core of social communication effectively. Consequently, choosing an appropriate assessment method is a challenging task from a pragmatic standpoint. Roth and Spekman (1984) presented recommendations for sampling, formalities levels employed, sort of tasks/interactions, as well as assessment significance. Dealing with preschoolers, according to them, necessitates observation with regard to a play segment, ideally utilising a communicative

intents checklist in which all pragmatic functions are marked. Nevertheless, written evaluation instruments for older children are uncommon; thus, the researcher must concentrate on activities that enable him to compare formal and informal settings. Considering the summary provided above about different pragmatic tests and that the current study focuses on verbally disordered children who are not preschoolers (school-aged), the researcher determined that "The Pragmatic Protocol devised by Prutting and Kirchner in 1983" is the optimal instrument for assessing pragmatic communication skills in this population being an overarching test that includes the highest number of different pragmatic aspects that can be assessed.

#### **3.1.4.1 The Pragmatic Protocol by Prutting and Kirchner (1982)**

The pragmatic protocol, a descriptive taxonomy designed by Prutting and Kirchner in 1982 and published in 1983 to give a comprehensive communication assessment for school-aged youngsters, teenagers, and adults (Prutting & Kirchner, 1987). This protocol comprises thirty (30) linguistic aspects of pragmatics. The above factors were estimated from both infant language-development literature and adult literature. It is crucial to build an instrument that reflects a variety of different elements described in the literature. According to Levinson's (1983) theory, the pragmatic characteristics spectrum occurs along a scale and encompasses features that rely on the use of rules that are generally autonomous of linguistic structure (e.g., eye gaze, physical proximity) as well as elements which are dependent on the context of linguistic structure (e.g., coherence). With a view to elucidate the pragmatic impacts of deficiencies across varying performance levels, the scholars have purposefully blended both dimensions within the assessment tool.

As stated, this protocol was developed to reflect a variety of observed parameters. Additional to inclusivity or breadth of coverage, the following characteristics were considered while developing the protocol: *Homogeneity* - All characteristics have a logical connection with communication skill and with one another; *Mutual exclusivity* - Each item pertains to a distinct

aspect of communicative competence as well as under a singular category, namely that of its utility or usefulness- every parameter has purpose connected to research objective. Fox (1969), as cited by Brandt (1972), indicated that these elements are desirable for the construction of taxonomies. Each element was categorised as either verbal, paralinguistic, or non-verbal.

Prutting and Kirchner (1987) assert that it is essential to make 'Appropriate' or 'Inappropriate' judgements related to the known topic, partner, and other context-specific factors. For example, a 5-year-old is capable of cohesion, although in fewer contexts or with a smaller number of syntactic structures as compared to an adult. When making decisions using this protocol, chronology and context must be considered. The gadget is intended for usage exclusively with children aged 5 years or older. As per the research in developmental literature, it has been observed that children demonstrate some manifestation of all the 30 criteria examined by the protocol by the age of 5. After the observation of persons engaging in spontaneous, unplanned conversation, the pragmatic procedure is than to be completed. At this point, every pragmatic component of the protocol's language is evaluated as 'appropriate', 'inappropriate', or 'not observed':

**Appropriate:** Parameters are deemed “appropriate” if they support the communication connection or if they are neuter.

**Inappropriate:** Aspects are deemed “inappropriate” if they distract from the communication engagement and punish the person.

**Not observed:** If the assessor lacks adequate data to decide whether the conduct is appropriate or not, the therapist checks this column. Aspects noted in this section are normally reevaluated throughout further examples of verbal contact for the evaluator to determine whether they are appropriate or not.

The aforementioned Protocol was designed in order to study in a methodical way the manner by which a communication breaks down in various patient groups. Different clinicians

employed it in a comparison of pragmatic impairments for four distinct clinical groups, including children individuals exhibiting anomalies in articulation, a language disorder, adults diagnosed with right-hemisphere lesions, and aphasic adults, as well as normal children and adults. All groups' reliability exceeded 90%: for children with language and articulation difficulties, it varied from 93% to 100%; for adults diagnosed with aphasia/right hemisphere lesions, it varied from 90% to 100%; as for typical adults and children, it was 100% (Cordier, et al., 2014; 2016)

The favorable outcomes obtained from the study led to the implementation of the protocol in diverse clinical assessments. Specifically, McCabe et al. (2007) assessed the pragmatic abilities of a male group with AIDS using the pragmatic measure. Fyrberg et al. (2007) used this pragmatic approach to evaluate the pragmatic abilities of youngsters and adolescents with brain injuries. Using the pragmatic protocol, Aubert et al. (2004) analysed nonverbal communicative competence of 04 males having Traumatic Brain Injury (TBI). They used the technique to generate a sample of pragmatic skills in patients with Persistent Schizophrenia. Menamara and Durso (2003) conducted an assessment of the pragmatic communication skills of a cohort of individuals diagnosed with Parkinson's disease, utilizing the protocol. Avent et al. (1998) employed this assessment to examine the association among linguistic impairment as well as pragmatic performance in individuals with Aphasia. The discourse pragmatic components of infants prenatally exposed to cocaine were evaluated by Mentis and Lundgren (1995) (as cited in Cummings, 2009, pp. 182-183).

The pragmatic procedure has never, to the best of the researcher's knowledge, been used to evaluate pragmatic communication skills in autistic children who are able to speak. This is among the first investigations to assess the pragmatic skills of autistic children who are able to communicate verbally. The appendix contains the protocol that is employed.

### **3.1.4.1.1 Communicative Parameters Assessed Using the Pragmatic Protocol: Definitions**

As noted earlier, the parameters are divided into three categories, according to Prutting and Kirchner (1987):

➤ **Verbal Aspects:**

**a. Speech Acts:**

**1. Speech Act Pair Analysis:** the capacity to assume the right roles of speaker and listener given the circumstances. The types included are:

- Directive/compliance

Imperatives, personal need, directives, permissions, questions, and suggestion:

- Question/response

Neutral requests for repeat, request for confirmation, requests for specified component repetition.

- Request/response

Inferred requests, direct requests, acknowledgment of action request, and clarification request.

- Comment/acknowledgment

Description of current actions; of immediately succeeding activity; of status or condition of things or persons, identifying positive; negative; or indicating acknowledgments.

Instances:

Appropriate conduct may be vocal or nonverbal, such as doing the proper action in response to an instruction or request.

Inappropriate behaviours include not being able to start directives, inquiries, or remarks; not replying to the speaker's directives, queries, or requests; and not employing vocal or nonverbal acknowledgments made by the speaker

(Austin, 1962; Gallagher, 1977; Garvey, 1975; Mitchell-Kernan & Kernan, 1977; Searle, 1969,

as cited in Prutting and Kirchner, 1987).

- 2. Variety of speech acts:** the potential impact of verbal communication on human achievement, including commenting, asserting, requesting, promising, and so on.

Instances:

Appropriate behaviours: The participant demonstrates both appropriate usage of and a variety of speech actions.

Inappropriate behaviours: The participant displays inappropriate/limited usage of varied verbal actions (e.g., a particular child with a restricted range of expressive abilities, solely capable of requesting objects without exhibiting any other forms of speech acts)

(Austin, 1962; Mitchell-Kernan & Kernan, 1977; Searle, 1969, as cited in Prutting and Kirchner, 1987).

**b. Topic:**

- 1. Selection:** selecting the topic which is suitable and pertinent to the context's multi dimensions.
- 2. Introduction:** introducing a new topic within a speech.
- 3. Maintenance:** maintaining topic across the conversation.
- 4. Change:** the phenomenon of topic shift within a discourse.

Instances:

Appropriate behaviours: ability of the speaker or the listener to construct pertinent contribution to a certain topic, the capacity to effectively formulate seamless transitions between topics at suitable junctures within the discourse, ability to choose an acceptable topic for conversation considering the setting and participant, as well as the skill to cease debate of a topic at an opportune time.

Inappropriate behaviours: the introduction of an excessive number of topics within the allotted timeframe, inability to generate new conversation topics, pick acceptable discussion subjects

given the setting and participants, and make important comments to a topic. The Inability to maintain subject co-occurs often with frequent introductions of new topics

(Bloom, Rocissano, & Hood, 1976; Brinton & Fujuki, 1984; Ervin-Tripp, 1979; Keenan, 1977; Keenan & Schieffelin, 1976, as cited in Prutting and Kirchner, 1987).

**c. Turn Taking**

- 1. Initiation:** initiating speech acts.
- 2. Response:** responding to speech acts as listeners.
- 3. Repair/revision:** repairing a communication when it breaks down and being able to request repair if a mistake or vagueness has taken place,
- 4. Pause time:** insufficient or excessive pause time in the context of responding to a query or within and between phrases.
- 5. Interruption/overlap:** interruptions occurring during the communication between the speaker and the audience; overlap is a term used to describe the situation where two individuals are speaking simultaneously.
- 6. Feedback to listener:** can be conveyed through either verbal or nonverbal behavior. Verbal feedback may take the form of affirmative expressions such as "yeah" and "really!", while nonverbal feedback may be indicated through head nods to convey positive affect or side-to-side movements indicating incredulity or negative effects.
- 7. Adjacency:** immediate statements after the speech of the partner.
- 8. Contingency:** similar statements to add information to a past communication act and have the same subject as a preceding utterance.
- 9. Quantity/conciseness:** the contributions ought to be sufficiently informative, however, not excessively informative.

Instances:

Within each of the aforementioned categories, the assessment of appropriate/inappropriate

behaviour is evaluated in reference to the speaker/listener relationship.

Appropriate behaviours involve the act of commencing dialogue, seeking elucidation when a portion of the communication is misconstrued, reacting to remarks made by the speaker, modifying one's own message to enhance comprehension, abstaining from interrupting or speaking before the counterpart has concluded, and evading speaking before the counterpart has finished speaking. Additionally, providing feedback to the speaker as a mechanism for propelling the conversation forward and utilizing appropriate pauses to reinforce temporal relationships in the discourse are recommended.

Inappropriate behaviours: a short introduction to the discourse, requiring one partner to move the conversation forward, no response to inappropriate reactions to the partner's request for explanation, no effort to make repairs, and Extended pauses that disturb the temporal coherence of the discourse, insufficient pause duration leading to overlapping or interrupting speech, inadequate provision of feedback to the interlocutor, and incapacity to generate responsive comments to the speaker's message

(Bloom et al., 1976; Brinton, Fujuki, Loeb, & Winkler, 1986; Duncan & Fiske, 1977; Ervin-Tripp, 1977; Ervin-Tripp, 1979; Gallagher, 1977; Grice, 1975; Keenan, 1977; Keenan & Klein, 1975; Keenan & Schieffelin, 1976; Sacks, Schegloff, & Jefferson, 1978, as cited in Prutting and Kirchner, 1987).

#### **d. Lexical Selection/Use between and across Speech Acts**

##### **1. Specificity/Accuracy:** the lexical elements that most aptly relate to the text

Instances:

Appropriate behaviour: the capacity to be precise and construct appropriate vocabulary selections in order to express information in a dialogue clearly.

Inappropriate behaviour: excessive usage of nonspecific referents that lead in message ambiguity. In addition, the text contains lexical choices that do not promote comprehension

(Prutting & Kirchner, 1987).

**2. Cohesion:** refers to the identifiable coherence or interrelatedness of written discourse.

- Reference

The semantic relationship in which the information required for the understanding of a certain item is located somewhere else in the text.

- Substitution

By substituting a word from the same grammatical class, a cohesive relationship is produced.

- Ellipsis

Refers to phrases or statements whose construction is such that the absence of information is assumed.

- Conjunction

A logical relation that exists between clauses.

- Lexical cohesion

By means of the selection of vocabulary.

Instances:

Appropriate behaviour: coherence and cohesion in the conversation. The dialogue is comprehensible, and the concepts are delivered in a logical and sequential manner.

Inappropriate conduct: a discourse is disconnected and statements do not seem to be logically and sequentially linked. The inability to follow the speaker's flow of thought usually results in misunderstanding and vagueness

(Halliday & Hassan, 1976; Keenan & Klein, 1975; Lahey & Launer, 1986, as cited in Prutting and Kirchner, 1987).

**e. Stylistic variances**

Refer to the modifications that a speaker implements in response to various dyadic

situations, such as alterations in syntax, utilization of polite forms, and adjustments in vocal quality.

Instances:

Appropriate behaviour: the capacity to adapt one's communication style to a particular audience.

Inappropriate behaviour: can be characterised as a discrepancy between the mode of communication and the position of the recipient, or a lack of differentiation when required (Sachs & Devin, 1976; Shatz & Gelman, 1973, as cited in Prutting and Kirchner, 1987).

➤ **Paralinguistic Aspects:**

**a. Intelligibility and Prosodic**

1. **Intelligibility:** the level of comprehension of the message.
2. **Vocal Intensity:** the acoustic intensity of the message, whether it is high or low.
3. **Vocal Quality:** the acoustic characteristics of the vocal tract's resonance and/or laryngeal features.
4. **Prosody:** the message's intonation and stress patterns; fluctuations in volume, pitch, and duration.
5. **Fluency:** the fluidity, coherence, and pace of the message.

Instances:

Appropriate behaviours: They entail the utilisation of speech that is characterised by clarity, optimal volume, and quality. Additionally, the speaker should employ suitable intonation, emphasis, and pitch that align with the communicative and linguistic objectives of the message.

Inappropriate behaviour: It can manifest in various forms, including but not limited to, speech that is ambiguous and prone to frequent misinterpretations, speech that is either excessively loud or soft, speech that deviates from the expected quality based on the speaker's age or gender, thereby hindering effective communication, and the lack of prosodic variation that supports the

affective and linguistic dimensions of the message

(Duncan & Fiske, 1977; Scherer & Ekman, 1982, as cited in Prutting and Kirchner, 1987).

➤ **Nonverbal Aspects:**

**a. Kinesics and Proxemics**

1. **Physical Proximity:** the spatial separation between the interlocutors in a seated or standing position.
2. **Physical Contacts:** the frequency and location of contact between a speaker/listener.
3. **Body Posture:** Forward lean refers to the physical orientation of a speaker or listener in which they position themselves at a 90-degree angle away from the other individual. Conversely, recline denotes a posture in which an individual slouches and leans away from their conversational partner. Lateral displacement refers to the translational motion of an individual in a horizontal plane, either towards the right or left.
4. **Foot/Leg and Hand/Arm Movements:** Any motor action involving the lower extremities or upper extremities, such as self-touching, object manipulation, bodily part contact, clothing adjustment, or gesturing.
5. **Gestures:** Any actions that serve to replace, complement, or supplement verbal behaviour.
6. **Facial Expression:** A positive facial expression is characterised by the upward curvature of the corners of the lips, whereas a negative expression is marked by the downward curvature of the same facial feature. A neutral expression, on the other hand, is observed when the face is in a state of repose, devoid of any discernible emotional affect.
7. **Eye Gaze:** Mutual gaze occurs when both individuals of a pair stare straight at one another's face.

Instances:

Appropriate behaviours: in the realm of interpersonal communication, appropriate behaviours encompass the utilisation of nonverbal cues that serve to convey the degree of affiliation between communicative partners, facilitate the regulation of conversational turns, and potentially reinforce or augment the verbal constituents of the message.

Inappropriate behaviours: refer to the utilisation of nonverbal components that impede the interpersonal and social aspects of communication. Such actions tend to detract from the message's substance, rather than supporting and regulating the conversation

(Craig & Gallagher, 1982; Duncan & Fiske, 1977; Feldman, 1982; Hoffer & St. Clair, 1981; Scherer & Ekman, 1982; Von Raffler-Engel, 1980, as cited in Prutting and Kirchner, 1987).

### **3.1.4.2 Language Sampling**

As indicated previously, the protocol ought to be executed after witnessing persons engaging in unstructured, spontaneous conversation with communicative partners. Language sampling, also known as 'spontaneous language sampling', relates to the sampling elicitation of a person's spoken language in a natural context and is regarded as among the most reliable and valid methods for evaluating spoken language performance. As a result, language sampling is regarded as a crucial component of the speech-language pathologist's evaluation technique and is used to describe the patient's strong and weak points in spoken language performance. The results of a thorough language sample analysis may validate or reject the results of standardised tests, aid in the formulation of specific and relevant therapy objectives, and permit the observation of treatment progress. The coming sections describe the speech situations wherein language samples are typically elicited and includes a quick summary of the most common elicitation techniques.

#### **3.1.4.2.1 Forms of Language Sampling**

According to Westerveld (2019), there exist diverse methodologies for the collection of

linguistic samples, including through free plays, conversations, narratives, expository, or persuasion. Several criteria, including the patient's age and the importance of the discourse genre to the patient's everyday functioning, influence the choice of context. The following passages present the three first forms used in the current study, namely; Free plays, Conversations, and Narratives:

#### **3.1.4.2.1.1 Free Play**

Language sampling involving young children takes place in a context of free play, wherein spontaneous language is produced by integrating a child in a play, for example: play with dough or small toys. To gather a random selection of the children's vocabulary, it is suggested to follow the children's lead and comment on their behaviours. The researchers should not ask too many questions or closed-ended queries, as they will affect the child's linguistic output.

#### **3.1.4.2.1.2 Conversation**

For individuals older than four years old, it is more efficient to obtain a language sample through discussion, using an interview technique in which the child is urged to describe members of the family or pets as well as activities related to school. Conversations comprise dialogues in which speakers initiate ideas, react, and ask questions in turn. Given the importance of communication in day-to-day activities, this discourse setting is suited for all patients, regardless of how old they are, including children, teenagers and adults. It is vital, while extracting a sample of conversations, to involve areas of interest to the individual, such as a favourite activity, as research has shown that this will result in a complex language sample. Conversation samples provide valuable information regarding the patient's language use or pragmatics, such as their ability to question and answer questions as well as stay on topic (which is stated before as parameters included within the protocol used for this study). nevertheless, during conversation, children, adolescents, and adults generate shorter and less

complicated utterances than they do in other speech situations, such as narrative, expository, and persuasive discourse.

### **3.1.4.2.1.3 Narrative**

Children might have the ability to generate simple and basic narratives by the age of four. Script, personal narrative (recounts of personal occurrences), and fiction narratives are all examples of narratives. The ability to repeat a basic story or series of events using a logical sequence and suitable terminology is a proven significant factor in predicting comprehension achievement during the elementary school years. Children of preschool and school age are open to narratives on a regular basis, such as when they share personal tales with the teacher or friends or when they are obliged to create imaginative stories as part of the school curriculum. Consequently, narrative language samples from preschool and school-aged children can be elicited through fictitious tale invention or retelling tasks, as well as in personal narrative situation.

All in all, the time spent in conducting the present study was enough to collect spontaneous language samples and acquire accurate as well as extensive information about the participants' pragmatic issues.

### **3.1.5.3 Participant Observation**

In qualitative research, observation, mainly participant observation, has been utilised in a range of fields to collect information about individuals, processes, and cultures. Participant observation has been a characteristic of anthropological and sociological research for many years. In recent years, the frequency of qualitative research in the field of education that employ participant observation to obtain data has increased.

According to Marshall and Rossman (1989, p. 79) observation is "the systematic description of events, behaviors, and artefacts in the social setting chosen for study". A 'written photograph' of an observed scenario is a valuable tool for researchers because it allows them

to use all five of their senses to describe what they are seeing (Erlandson et al., 1993). Participant observation is described by Demunck and Sobo (1998) as the principal approach employed by anthropologists conducting fieldwork. Fieldwork requires "active looking, improving memory, informal interviewing, writing detailed field notes, and perhaps most importantly, patience" (Dewalt & Dewalt, 2002, p. vii).

The term "participant observation" refers to a technique that allows researchers to understand the behavior of the person under investigation in their natural environment by observing and engaging in those activities. It offers the context for the establishment of sample and interview standards (Dewalt & Dewalt, 2002). Schensul et al. (1999, p. 91) describe observation method as "the process of learning through exposure to or involvement in the day-to-day or routine activities of participants in the researcher setting". According to Whyte (1979, p. 158) the goal of data extracted from observations is to identify: "the observed context, the observed activities, and the observed participants as well as their engagement in the observed activities". He adds that "Participant observation is generally regarded as an important data-gathering tool" (Whyte 1979, p. 161).

Bernard (1994) extends this by suggesting that researchers have to retain objectivity through distance. He identifies participant observation as the process of building rapport within a group and learning how to act in such a way that others in the group will do what is expected of them, and then removing yourself from that environment so that you can immerse yourself in the data so to understand what is happening and write about it. As a participant observer, he employs more than just observation; he employs observation, interviews of various types, natural conversations, questionnaires, checklists, and unobtrusive procedures. Participant observation is characterised by actions such as being interested in learning more about others, having an open, non-judgmental attitude, being aware of the likelihood of experiencing culture shock. Being a keen observer and a good listener, as well as being open to

the unexpected in terms of what is learned, can help overcome the majority of obstacles (Dewalt & Dewalt, 1998).

Demunck and Sobo (1998) list numerous benefits of participant observation above other data collection approaches. This includes the fact that it provides access to "backstage culture" (p.43); that it enables a rich detailed account, which researchers interpret to indicate that everyone's objective of presenting "behaviors, intentions, situations, and events as understood by one's informants" is highlighted (p.43); and that it affords the opportunity to view or participate in unplanned events. It enhances the quality of data collection as well as interpretation, helps the formulation of new research questions or hypotheses, and reinforces the triangulation of research tools (Dewalt & Dewalt, 2002).

There is no time limit on the observation period, as it is determined solely by the research objectives. Studies have demonstrated that the longer time invested observing, the stronger findings will be (Flick, 2006). To achieve the study aims and address the research questions, the observers must clearly identify their objectives, determine which elements they want to examine, and establish a schedule for their actions. These processes must relate to the research topic.

In the present study, in a positive environment, the researcher observed all what transpired throughout each attended session, with a focus on the interaction of the children, motivational factors, as well as linguistic challenges faced. The researcher kept a checklist for each child, filling it in as she saw various aspects connected to pragmatic communicative skills. In addition to filling out a checklist for each child, the researcher also recorded their observation in the guise of written annotations, thereby enabling her to see more clearly what the youngsters and their instructors/parents had accomplished over time.

Participant observation entails the researcher's participation in a range of activities over a long length of time in order to observe the study participants in their everyday lives and engage

in their activities in order to gain better comprehension of those behaviours and actions. Entrance into the community, the selection of key informants and gatekeepers, the clarification of someone's results through participant formal interviews, checklists, and informal conversations, as well as keeping of organised notes to assist in managing are required to conduct this type of method. Participant observation has proven to be an effective process for conducting studies that provide an accurate depiction of a phenomenon in a variety of fields where it is employed as a fieldwork staple.

### **3.1.5 Statistical Instruments for Data Analysis**

A study's statistical instruments include planning, designing, collecting data, analysing, making relevant interpretations, and reporting the results of the research. The statistical analysis offers meaning to meaningless numbers and hence gives life to inanimate facts. Only if appropriate statistical tests are employed are the results and conclusions accurate. The following statistical tools were utilised by the researcher to analyse the study's data:

#### **3.1.5.1 Frequency Distribution**

The frequency distribution is a tabular or graphical depiction of the number of individuals in each measurement category (Gravetter & Wallnau, 2000). It enables the researcher to quickly and easily view the entirety of the data. It indicates whether the observations are high or low, as well as whether they are concentrated in a particular place or distributed across the entire scale. Thus, frequency distribution depicts the distribution of individual observations along the measuring scale (Manikandan, 2011).

#### **3.1.5.2 Percentage Distribution**

In general, a percentage frequency distribution is a display of data that provides the percentage of observations for each data point or data group. It is a prevalent technique for presenting the relative frequency of survey answers and other data. The frequency distributions of percentages are frequently shown as Tables, Pie Charts, or Bar Graphs.

In the current study, frequency distribution and percentage distribution are employed to examine children's overall performance on the 30 pragmatic behaviours that were evoked.

### **3.1.5.3 Mean**

"The arithmetic mean" or "average," commonly referred to as "mean," is determined by dividing the summation of the observed values by the total count of the observations. The mean is frequently represented as a little bar above the sign for the variable ""

### **3.1.5.4 Standard Deviations**

This is the most frequently employed measurement of the dispersion or spread around the mean. The mathematical relationship between the standard deviation and variance (V) is that the former is the positive square root of the latter. The variance is computed through the division of the summation of squared deviations from the arithmetic mean by  $n-1$ . The computation of the mean and standard deviation can be performed easily on a calculator, but it is most convenient on a Personal Computer (PC) with easy, ready-to-use programmes such as Lotus 123, dBASE, Excel, and Quattro-Pro.

In the current study, Means and Standard Deviations are used to determine if there are disparities in the pragmatic skills produced by autistic children.

### **3.1.5.5 T-Test**

The 'T-test' is a statistical tool utilised to compare the means of two distinct groups. It is frequently used in hypothesis testing to examine whether a process or treatment truly has an effect on the target population or whether two groups are distinct.

The present investigation employs the T-test to evaluate the statistical significance of the impact of independent variables, namely age, gender, and school attendance, on various pragmatic parameters.

### **3.1.5.6 F-Test**

Given the "between-groups" (treatment) mean square as well as the "within-

groups" (error) mean square, this tool will calculate the F-value connected with an "Analysis of Variance (ANOVA) research (Scheffé, 1999).

The present investigation employs the F-Test to evaluate the statistical significance of the impact of MLU and the pragmatic parameters.

### 3.1.5.6 Pearson correlation Coefficients (*r*)

It is the most widespread method for assessing linear correlation. The coefficient of determination, ranging from -1 to 1, measures the degree and direction of the link between two variables. It is a descriptive statistic, which outlines the features of a dataset. It explains specifically the intensity as well as direction of the linear relation between two quantitative variables. Turney (2022) summarises the rules of the instrument in the following table:

**Table 5**

*Rules of Pearson Correlation Coefficient (r) adapted from Turney (2022)*

Pearson Correlation Coefficient ( <i>r</i> )	Correlation Type	Interpretation	Example
[0-1]	Positive	alterations in one variable are accompanied by corresponding modifications in a second variable in the <b>same</b> manner.	Baby length and weight: The longer a baby is, the heavier he or she is.
[0]	No Correlation	<b>No</b> relationship exists between the variables	The car cost and its windshield wipers: There is no correlation between the cost of a vehicle and the width of its windshield wipers.
[(-1)-0]	Negative	alterations in one variable are accompanied by corresponding modifications in a second variable in the <b>opposite</b> manner.	Elevation and air pressure: As elevation increases, air pressure decreases.

The present investigation employs Pearson Correlation Coefficients to assess the association between MLU and the remaining independent variables, namely age, gender, school attendance, and MLU.

### **3.1.6 Study Variables**

The variables under investigation in this study are as follows:

#### **3.1.6.1 Dependent Variables:**

The present investigation concerns itself with a set of 30 pragmatic skills as delineated by Prutting and Kirchner (1987), which are considered the dependent variables. They consist of:

- **Verbal Acts:** speech acts (speech act pair analysis, variety of speech act); topic (selection, introduction, maintenance, change); turn-taking (initiation, response, repair/revision, pause time, interruption/overlap, feedback to speakers, adjacency, contingency, quantity/ conciseness); lexical selection/use across act speech acts (specificity/accuracy, cohesion); stylistic variations (the varying of communicative styles).
- **Paralinguistic Aspects:** intelligibility and prosodics (intelligibility, vocal intensity, vocal quality, prosody, fluency).
- **Non-verbal Aspects:** kinesics and proxemics (physical proximity, physical contacts, body posture, foot/leg and hand/arm movements, gestures, facial expressions, eye gaze).

#### **3.1.6.2 Independent Variables:**

The present investigation incorporates age, gender, school attendance, and mean length of utterance (MLU) as independent variables. The subsequent tables illustrate the distribution of the independent variables utilised in this study:

**Table 6**

*Distribution by Age of Participants*

<b>Participant Age</b>	<b>Frequency Distribution</b>	<b>Percentage Distribution (%)</b>
Five (05) Years	01	07.70
Six (06) Years	01	07.70
Eight (08) Years	03	23.00
Nine (09) Years	01	07.70
Ten (10) Years	01	07.70
Eleven (11) Years	02	15.40
Fourteen (14) Years	01	07.70
Seventeen (17) Years	02	15.40
Eighteen (18) Years	01	07.70
<b>Total</b>	<b>13</b>	<b>100.0</b>

**Table 7**

*Gender Distribution of Participants*

<b>Gender</b>	<b>Frequency Distribution</b>	<b>Percentage Distribution (%)</b>
Male	08	61.50
Female	05	38.50
<b>Total</b>	<b>13</b>	<b>100.0</b>

**Table 8**

*Distribution of Participants according to Attending School*

<b>Attending School</b>	<b>Frequency Distribution</b>	<b>Percentage Distribution (%)</b>
Yes	08	61.50
No	05	38.50

<b>Total</b>	13	100.0
--------------	----	-------

**Table 9**

*Mean Length Utterance for each Participant.*

<b>Participant</b>	<b>Mean Length Utterance</b>
Number One	1.59
Number Two	1.87
Number Three	3.85
Number Four	2.32
Number Five	4.15
Number Six	2.46
Number Seven	3.02
Number Eight	5.78
Number Nine	4.98
Number Ten	5.54
Number Eleven	4.68
Number Twelve	5.25
Number Thirteen	6.31

### **3.2 Population and Sample Description**

#### **3.2.1 Population Definition**

Polit and Hungler (1999, p. 37) define the population as "an aggregate or totality of all the objects, subjects or members that conform to a set of specifications". It relates to any set of designated groupings of humans or non-humans, such as educational institutions, objects, time units, geographical regions, wheat prices, or individual incomes.

#### **3.2.2 Sample Definition**

A sample is a subset of the whole population that is selected to participate in research; it is a portion of the whole chosen to be a participant in a research endeavour (Brink, 1996; Polit

& Hungler, 1999). The sample is the collection of units chosen to reflect the target population (Gravetter & Wallnau, 2017). The sample data is evaluated, and the results are extrapolated (quantitative) or interpolated (qualitative) to the target population. The condition that the sample be representative of the population of interest is met by prescribing the suitable sampling frame and employing an acceptable sampling method. There are two key concerns when selecting a sample: how many elements should be included (sample size) and how these units will be chosen (sampling methods). In this study, a subset of 13 autistic children were selected (08 males as well as 05 females) from Dar El Amal Wa Tadamon out of the entire population of autistic children in the state of Batna, Algeria following the purposive sampling. It is a procedure that allows researchers to select characteristic cases of the population by limiting the sample to these cases.

### **3.2.3 The eligibility criteria of the Sample**

These criteria outline the traits that population members must possess to be included in the research (Polit & Hungler 1999:278). This study's inclusion requirements required participants to meet the following conditions:

- Autistic,
- Children (under the age of 18),
- Verbal,
- Belong to a specific centre in Batna (Dar El Amal Wa Tadamon).

### **3.2.4 The Sampling Procedure**

The sampling is the procedure of identifying a representative subset of a whole population (LoBiondo-Wood & Haber 1998:250; Polit & Hungler 1999:95). A number of verbal autistic children in Batna were selected. Instead of attempting to examine the complete population of autistic children in Algeria, time and expense were saved by choosing a sample for research. Obtaining data from the whole Algerian autistic children community, in

addition to analysing and interpreting massive amounts of data, would have been impossible given the time limits, limited financial resources, as well as the sensitivity of this population.

### 3.2.5 Sample Size for Case Study

As the majority of instances are single individuals (Yin, 2014), it is possible to recruit a single individual as the sample. Nevertheless, small sample sizes are frequently insufficient to facilitate the development of claims, supply redundant information, or achieve theoretical saturation (Sandelowski, 1995). Creswell (2013) suggests selecting cases that show different perspectives on the problem, process or event” (p. 100), implying that numerous participants should be included and supporting the use of multiple instances to study the issue. Marshall et al. (2013) suggest that saturation typically occurs at thirty (30) interviews. Because case study strongly advocates using extra sources to corroborate the data and to achieve saturation, it is recommended to include 12 to 15 people to provide multiple viewpoints on the case phenomenon and to use additional sources of data supporting the conclusions. The following table presents different research designs with the recommended number of participants based on a variety of references:

**Table 10**

*Recommended a Priori Sample Size for Different Research Designs*

<b>Research Design</b>	<b>Recommended a Priori Sample Size</b>	<b>References</b>
<b>Descriptive</b>	10-20	Kim et al., 2017; Lincoln & Guba, 1985
<b>Case study</b>	<b>12-15</b>	Creswell, 2013; Marshall et al., 2013; Sandelowski, 1995; Yin, 2014
<b>Phenomenology</b>	03-10	Marshall et al., 2013; Sim et al. 2018; Smith & Osborn, 2003
<b>Ethnography</b>	20-30	Bernard (2011; 2013)

<b>Narrative</b>	02-03	Creswell, 2013
<b>Grounded theory</b>	20-30	Charmaz, 2014; Creswell, 2013

### 3.2.6 Profiles of Autistic Children Participants

The United Nations Convention on the Rights of the Child (UNCRC) states that a child is “A human being below the age of 18 years unless under the law applicable to the child, majority is attained earlier.”

Following is a profile of every child who participated in this investigation:

**Table 11**

*Profiles of Autistic Children Participants*

<b>Participant</b>	<b>Age</b>	<b>Gender</b>	<b>Initial Diagnosis Made at Age</b>
<b>Number One</b>	05	Female	02
<b>Number Two</b>	08	Female	03 and a couple of months
<b>Number Three</b>	08	Female	03
<b>Number Four</b>	11	Female	02.50
<b>Number Five</b>	14	Female	03
<b>Number Six</b>	06	Male	03.50
<b>Number Seven</b>	08	Male	02
<b>Number Eight</b>	09	Male	02
<b>Number Nine</b>	10	Male	02.50
<b>Number Ten</b>	11	Male	02.50
<b>Number</b>	17	Male	03.50

---

<b>Eleven</b>			
<b>Number</b>	17	Male	03
<b>Twelve</b>			
<b>Number</b>	July, 2022 (18		
<b>Thirteen</b>	years)	Male	

---

### 3.3 Data Collection Procedures

According to Polit and Hungler (1999, p. 267), data is "information obtained in a course of a study". Data gathering entails amassing information to answer the crucial assessment questions identified by the author of the study earlier in the assessment process. It is an essential component of any research investigation. The present investigation relied primarily on the Pragmatic Protocol devised by Prutting and Kirchner (1987), with data collection consisting of a combination of sampling and hidden observation of naturalistic language use over a period of approximately eight months. Consequently, the researcher has gathered as much data as possible to be able to address the research questions. The choice of these information-gathering techniques was dictated by the research parameters, such as designated time frame for data gathering as well as the participants' availability, as well as the access and official authorization to work directly with autistic children.

The evaluation process involves of sessions of spontaneous language sampling. An excursion was planned by the centre and attended by the researcher to be able to observe children in spontaneous and different settings to collect the needed amount of data and overcome barriers between the participant and the researcher. Other scenarios included conversations, and playing sessions. By employing several forms of spontaneous language sampling, children are given multiple opportunities to display communicative behaviour and the Mean Length of Utterance for each child is determined.

### **3.3.1 Steps Followed for Data Collection**

In order to ascertain the MLU of each child and complete the checklists, the subsequent procedures were implemented:

- The researcher carefully pays attention to each recording, then notes 100 utterances from each participant and fills the checklist for each.
- Identifying 100 Independent Consecutive Utterances for Each Child in which MLU's were calculated based on the criteria outlined in Brown's own regulations (1973, p. 54).
- In calculating morphemes numbers, the present study employed established guidelines based on the research of Dromi and Berman (1982) for Hebrew. These guidelines were adapted to the specific morphological characteristics of Algerian Arabic, as outlined in the appendix (\*). Subsequently, the investigator partitions the total count of morphemes by the aggregate number of utterances:

**Mean Length Utterance= Number of Morphemes/ Number of Utterances**

- The present study involved the fulfilment of the Pragmatic Protocol as a means of assessing the presence or absence of various communicative skill sets, as previously implemented by Prutting and Kirchner (1987). Each pragmatic aspect of communication on the protocol is assessed in terms of its appropriateness, categorised as 'always appropriate' when the behaviour is consistently expressed, either verbally or non-verbally, 'sometimes appropriate' when the behaviour is intermittently expressed or observed, and 'absent' when the behaviour is neither expressed nor observed.

### **Conclusion**

The present chapter expounds upon the research design implemented in this study, encompassing the rationale for the adoption of case study as a research design as well as the methods employed to complete the present work. The highlighted variety of methodologies and approaches fall under the paradigms of both qualitative and quantitative research, population,

sampling, data collection instruments, and data collection procedures. To enhance the rigour and robustness of the research outcomes, certain procedures were followed. The subsequent chapter summarises the data gathered for each instrument, as well as their analysis and interpretation in accordance with the objectives, research questions, as well as hypotheses.

**Chapter Four**  
**Data Analysis and Interpretation**

Introduction.....	160
4.1 Children's Performance on the pragmatic parameters as a whole .....	162
4.1.1 Always Appropriate Pragmatic Parameters.....	164
4.1.2 Sometimes Appropriate Pragmatic Parameters .....	164
4.1.3 Absent Pragmatic Parameters .....	165
4.2 Analysis of the Performance of each Parameter .....	165
4.2.1 Speech Act Analysis (Variety/Pair) .....	165
4.2.2 Topic Selection, Introduction, Maintenance, and Change .....	167
4.2.3 Turn Taking .....	170
4.2.3.1 Conversational Initiation/Response .....	170
4.2.3.2 Conversational Repair/Revision .....	172
4.2.3.3 Pause Time .....	173
4.2.3.4 Interruptions/ Overlaps .....	175
4.2.3.5 Feedback to Speakers.....	176
4.2.3.6 Adjacency.....	176
4.2.3.7 Contingency.....	178
4.2.3.8 Quantity/Conciseness.....	178
4.2.4 Lexical Selection/Use across Speech Acts .....	179
4.2.4.1 Specificity/Accuracy .....	179
4.2.4.2 Cohesion.....	180
4.2.5 Stylistic Variations .....	181
4.2.5.1 The Varying of Communicative Styles.....	181
4.2.6 Intelligibility and Prosodics .....	183
4.2.6.1 Intelligibility .....	183
4.2.6.2 Vocal Intensity/Vocal Quality and Prosody.....	184
4.2.6.3 Fluency.....	186
4.2.7 Kinesics and Proxemics.....	189
4.2.7.1 Physical proximity, Contacts, and Body Posture .....	189
4.2.7.2 Foot/Leg - Hand/Arm Movement .....	191
4.2.7.3 Gestures and Facial Expressions .....	192
4.2.7.4 Eye Gaze .....	193
4.3 Pragmatic Skills Distribution according to Prutting and Kirchner Protocol (1987) .	196

4.3.1 The Verbal Aspects .....	196
4.3.2 The Paralinguistic Aspects .....	198
4.3.3 The Nonverbal Aspects .....	198
4.4 The Impact of Age, Gender, Education, and Mean Length of Utterance on Pragmatic Development in Autistic Children.....	200
4.4.1 The Pragmatic Aspects Associated with Age .....	200
4.4.2 The Pragmatic Aspects Associated with Gender .....	205
4.4.3 The Pragmatic Aspects Associated with School Attendance .....	209
4.4.4 The Pragmatic Aspects Associated with Mean Length of Utterance (MLU).....	214
4.5 Performance of Children on Pragmatic Aspects and Corresponding MLU.....	221

## **Chapter Four**

### **Data Analysis and Interpretation**

#### **Introduction**

Few academic disciplines have received as much attention as pragmatics. Recent years have seen an avalanche of study in this field. Wiemann (2003, p. ix) eloquently explained the underlying causes:

Our ability to create and sustain our social world depends in large measure on how well we communicate. People's social skills are crucial to their well-being – individually and collectively. The importance of understanding skilled behavior in all its complexities cannot be overstated.

To be well, to have fulfilling relationships, and to do any of the many tasks required of us as human beings, we must be competent communicators (Hannawa & Spitzberg, 2015). The fundamental deficiency in autistic individuals is centred on the domain of language pragmatics, so by approaching the problem from this perspective, people will understand this population to have a better quality of life, which is why the study of this area is so important, especially in a sensitive population like "Autistic Individuals."

In the current chapter, the researcher assesses the development of different pragmatic communicative skills with regard to 13 verbal autistic children ranging from 5 to 18 years old using 30 indicators of the pragmatic protocol designed by Prutting and Kirchner in 1982 classified into three distinct categories, namely verbal acts, paralinguistic elements, and non-verbal elements, with respect to age, gender, school attendance, and mean length of utterance (MLU). In addition to that, the chapter provides evidence about the correlation between MLU and age, gender, as well as attending school. Each of the above is analysed quantitatively using a specific statistical instrument for better understanding. The results are summarised in tables.

#### **4.1 Children's Performance on the pragmatic parameters as a whole**

The primary objective of this investigation was to assess the efficacy of a descriptive

classification system that may be employed in identifying the spectrum of pragmatic impairments in autistic children. The findings of the investigation are explicated in relation to the pattern tendencies that represented the participants' behaviours. These results are divided into three groups:

**Always Appropriate:** Parameters are deemed always appropriate if they support the fact that they are present during the assessment.

**Sometimes Appropriate:** Parameters are deemed sometimes appropriate if they appear and disappear during the assessment. They are not always present.

**Absent (Not observed):** If the assessor does not notice the parameter during the assessment, it means that it is absent.

**Table 12**  
*Performance on the pragmatic parameters as a whole*

Pragmatic Parameter	Researcher Assessment							
	Always Appropriate		Sometimes Appropriate		Absent		NO OPPORTUNITY TO OBSERVE	
	Fre q	Per %	Fre q	Per %	Fre q	Per %	Fre q	Per %
<b>VERBAL ASPECTS</b>								
<b>Speech Acts</b>								
Speech act pair analysis	7	53.8	3	23.1	3	23.1	0	0
Variety of speech acts	3	23.1	4	30.8	6	46.2	0	0
<b>Topic</b>								
Selection	4	30.8	3	23.1	6	46.2	0	0
Introduction	0	0	3	23.1	9	69.2	1	7.7
Maintenance	1	7.7	3	23.1	9	69.2	0	0
Change	9	69.2	4	30.8	0	0	0	0
<b>Turn Taking</b>								
Initiation	1	7.7	3	23.1	9	69.2	0	0
Response	6	46.2	7	53.8	0	0	0	0
Repair / revision	1	7.7	2	15.4	10	76.9	0	0
Pause time	1	7.7	0	0	12	92.3	0	0
Interruption/ overlap	6	46.2	7	53.8	0	0	0	0
Feedback to speakers	2	15.4	10	76.9	1	7.7	0	0

<b>Adjacency</b>	0	0	9	69.2	4	30.8	0	0
<b>Contingency</b>	0	0	5	38.5	8	61.5	0	0
<b>Quantity/ conciseness</b>	0	0	2	15.4	10	76.9	1	7.7
<b>Lexical Selection/Use Across Speech Acts</b>								
<b>Specificity / accuracy</b>	2	15.4	3	23.1	8	61.5	0	0
<b>Cohesion</b>	1	7.7	2	15.4	10	76.9	0	0
<b>Stylistic Variations</b>								
<b>The varying of communicative styles</b>	2	15.4	4	30.8	7	53.8	0	0
<b>PARALINGUISTIC ASPECTS</b>								
<b>Intelligibility and Prosodics</b>								
<b>Intelligibility</b>	4	30.8	8	61.5	1	7.7	0	0
<b>Vocal intensity</b>	1	7.7	9	69.2	3	23.1	0	0
<b>Vocal quality</b>	3	23.1	8	61.5	2	15.4	0	0
<b>Prosody</b>	1	7.7	6	46.2	6	46.2	0	0
<b>Fluency</b>	1	7.7	2	15.4	10	76.9	0	0
<b>NONVERBAL ASPECTS</b>								
<b>Kinesics and Proxemics</b>								
<b>Physical proximity</b>	0	0	11	84.6	2	15.4	0	0
<b>Physical contacts</b>	0	0	9	69.2	4	30.8	0	0
<b>Body posture</b>	0	0	7	53.8	6	46.2	0	0
<b>Foot/leg and hand/arm movements</b>	13	100	0	0	0	0	0	0
<b>Gestures</b>	0	0	4	30.8	9	69.2	0	0
<b>Facial expression</b>	2	15.4	6	46.2	5	38.5	0	0
<b>Eye gaze</b>	3	23.1	7	53.8	3	23.1	0	0

#### 4.1.1 Always Appropriate Pragmatic Parameters

Beginning with the primary cohort, Table 12 illustrates that the optimal attributes for all children were Foot/Leg and Hand/Arm Movements (100%), after which Topic Change comes with (69.2%). These pragmatic traits are found in every child observed.

#### 4.1.2 Sometimes Appropriate Pragmatic Parameters

The above table demonstrates that 13 parameters have a high occurrence rate (ranging from 46.2 to 84.61%); Physical Proximity (84.61%); Feedback to Speakers (76.9%); Adjacency, Vocal Intensity, and Physical Contact (69.23%); Intelligibility, and Vocal Quality (61.54%), Response, Interruption/Overlap, Body Posture, and Eye Gaze (53.15%); Prosody,

and Facial Expression (46.2%)

#### **4.1.3 Absent Pragmatic Parameters**

The table additionally demonstrates that one component was completely absent in children with autism. This is: Pause Time (92.3%). This parameter is normally demonstrated with the full percentage because the only child who behaved well was afraid of parents' punishment. The absence of 11 more characteristics whose absence is confirmed Upon exceeding a certain percentage of 50%, these entities are categorised based on their frequency of appearance: Repair/Revision, Quantity/Conciseness, Cohesion, and Fluency (76.92%); Topic Introduction, Topic Maintenance, Initiation, and Gestures (69.2%). Other Parameters are; Contingency, Specificity/Accuracy (61.5%). Finally, is Varying of Communicative Styles with a percentage of 53.85%. The other criteria are represented by a percentage of 46.2 percent; they are: Variety of Speech Acts, Topic Selection, Prosody, and Body Posture.

#### **4.2 Analysis of the Performance of each Parameter**

People connect with individuals on a regular basis, whether at home, work, or school. Such unplanned dialogues are extremely structured and flow smoothly, with occasional overlaps and pauses (Sacks et al., 1978). Face-to-face conversation, which is characterised by "back and forth" exchange between communicators, may seem to be a "simple" ability that everyone executes readily, yet cognitive researchers and psychologists have always amazed at its sophistication. For scholars who attempt to explain and comprehend the fundamental processes that make face-to-face interactions possible as well as how these interactional skills improve, such as developmental psychologists, (psycho)linguists, sociologists, and computer scientists, this has always been a significant field of research (Levinson & Holler, 2019).

##### **4.2.1 Speech Act Analysis (Variety/Pair)**

Pragmatics is a discipline of linguistics that investigates meaning-related characteristics that cannot be represented by 'semantic theory'. It provides methodical explanation of language

use in specific contexts. Each time the speaker utters a statement, they are intending to achieve an objective; particularly, they attempt to have an impact on the audience and they want the listeners to understand this intent. 'The speech-act theory', which is mostly credited to John Searle, aims to explain how humans achieve things with the words they utter. The speech act is considered a communicative functional unit. It refers to the action performed by the speaker when they utter a statement. However, the originator of this theory, Austin, neglects the persuasive power of 'intention' in communication settings. This is illustrated by Searle's theory, which combines both the intentional and conventional parts of meaning. Due to their emphasis on an individual communicative act, Austin and Searle's approach to Pragmatics trails behind other theories. Humans' comprehension of the world depends not just on what is spoken, yet also on what is intended. The majority of our statements are understood by listeners depending not just on the grammatical meaning, but on the speaker's genuine intent as well.

Unquestionably, issues with pragmatic aspects of language are among the most prominent and often cited indicators of autism. In order to use context to determine the literal meaning indicated by the speaker during a discussion, an addressee must exhibit specific pragmatic abilities. The way a language depicts the world has been and is a central preoccupation of linguistics. At every phase of language development, the 'speech acts' development happens concurrently through the development of linguistic components of language. In contrast, autistic children are occasionally characterised as exhibiting a strict as well as stereotypical language use, in which a particular word or phrase is utilised solely within circumscribed settings and verbal patterns (Loveland et al., 1988). In addition, autistic children are considered to be more likely to not respond and make a small number of communicative acts as compared to typical children. They tend to use language for a restricted variety of communication objectives.

The findings indicate that while the autistic group, as a whole, generated a variety of

speech acts, some children produced just a limited repertoire of speech acts, including but not limited to negating, affirmation, attention-directing, and request-making. In addition, the study results show that ASD children exhibit deficits in the domain of "directives and responses," that entail the communicative skills to express agreement or disagreement with each other, direct the attention of others, issue a warning and inquire about the interlocutor's intention, as well as knowing the interlocutor's viewpoint and collaboratively sharing goals. These results are validated by Loveland and Landry (1986); Prutting and Kirchner (1987); Loveland et al (1988); and Cho et al (2007).

#### **4.2.2 Topic Selection, Introduction, Maintenance, and Change**

Language is primarily a social transaction in which ideas are exchanged. These encounters seem easy, are typically unplanned and spontaneous (Pridham, 2013), yet they are regulated by unwritten laws which are mostly unclear and are frequently recognised when they are improper (Twachtman-Cullen & Twachtman-Bassett, 2014). Particularly intricate are skills linked to initiating, changing, and maintaining a topic. An interlocutor continuously evaluates whether what they want to communicate is pertinent, and little indications from a partner in a conversation must be identified and processed so that dialogues stay coherent. Raising questions or making comments about a discussion partner's topics demonstrates attention, but raising several inquiries or making too many remarks may come off as unnatural or invasive.

Numerous research has recorded and investigated the conversational competences of autistic individuals. (Sng et al., 2020) account on the abnormal characteristics of persons with ASD and compare them to peers with usual development or individuals with other disorders. The observed distinctions between individuals diagnosed with ASD and their non-ASD counterparts were not as significant as anticipated, and the key distinction was in maintaining a topic, such as offering on-topic comments and new material that lengthened a discussion. Participants responded that autistic children's social interaction communication is still limited.

It was previously noted that Autistic participants in the current study performed remarkably high in topic shifting. Therefore, poor topic maintenance performance was observed. According to National Institute of Health (2012), inability to select, initiate, and maintain the topic is a common language use pattern and behaviour in autistic children. It is primarily a reason to their focused interests and extraordinary abilities. A child may be capable of delivering a "comprehensive monologue" on a topic that piques their interests, whereas others might not be able to hold a "two-way conversation" on an identical matter. Other autistic children possess musical abilities or advanced counting and mathematical skills. About 10 percent of autistic children exhibit 'savant' talents, or extraordinarily high ability in specialised domains such as music, calendar calculation, mathematics, and computer science. A second reason is the lack of nonverbal communication abilities. Autistic children do not employ gestures in social settings. Additionally, avoidance of eye contact hinders the ability to conduct discussion. They may appear impolite and inattentive.

Autistic individuals are incapable of establishing an efficient strategy for topic maintenance, determining which propositions or facts are essential to continue a talk, as they may recall a string of irrelevant facts and therefore have difficulties recalling the topic's essence. It is asserted that youngsters frequently lose their train of thought when conversing with peer(s) (Blank & Franklin, 1980, cited in Schley & Snow, 1992:20). Children, being inactive or incapable of maintaining a topic in a discussion with an adult, may be attributable to ignorance of the conventionally set list of topics which organises spontaneous talk among adult(s) (Kellerman, et al., 1989, cited in Ninio & Snow, 1999:18). Consequently, in the current study, the author hypothesises that ASD children's violation of topic maintenance is associated with difficulties in their interpretation of conversational topic connections.

Another deficiency exhibited by the participants is the inability to choose an appropriate conversation topic. It is frequent for autistic individuals to have trouble picking a suitable topic

to initiate a discussion due to their commonly impaired conversational abilities. This will also make it difficult to introduce topics to those with ASD.

Changing the topic represents one of the most frequently observed behavioural patterns among autistic children. It is shown by a high percentage (69.23%), with 9 out of 13 participants in the current study always demonstrating such pattern, 4 out of 13 participants sometimes demonstrating the pattern and none of them did not demonstrate the pattern. This indicates that the aspect is present in varied degrees among all individuals. The investigation of "language in autism" is widely acknowledged to be characterised by numerous observations, including the occurrence of excessive repetition in autistic children; a phenomenon called "echolalia" in pediatric. It is considered that the repetitions or strict language exhibited by children with autism is among the reasons of topic shifting. Frequently, autistic children who are able to talk will express meaningless or irrelevant comments during interactions with others. For instance, a youngster may continually count from one to five during a discourse unrelated to numbers. As well as, a youngster may constantly repeat terms they heard, leading to a change in topic. The current study revealed that ASD participants engage in improper topic changes and topic maintenance, hesitations, aborted phrases, anomalous semantic content, as well as more turns. More topic Initiations and Unexpectedly topic shifts were observed in interactions with children in the current study, indicating that they have difficulty maintaining the topic in a conversation.

Topic changes in ASD interactions are influenced more by environmental stimuli than by the knowledge an individual has. It is considered that the salience of this particular component in ASD children is associated with a difficulty in transitioning to a new topic and an sudden urge towards reiterating a specific point during conversational exchanges. Furthermore, as stated previously, on the assumption that an autistic participant is not able to construct efficient strategies for maintaining the topic, determining which propositions or facts are necessary for

carrying on a discourse, they may retain a sequence of unrelated data and so have difficulties remembering the topic's essence. The cause for changing topics in ASD-related studies may also be due to issues with a particular topic's comprehension. In the midst of an interaction that was not supposed to be about cars, one of the children in this research asked the caregiver about "cars". The caregiver replied to the youngster and then returned to the first topic. Yet, the participant repeatedly said "cars, cars, cars" (indicating he wanted to engage in a discussion about cars), interfering with the speech of the caregiver. Even though the caregiver said, "Sure, we are going to talk about cars," she was still speaking about the original subject. The boy continued to say the word "cars" as he suddenly recalled that he used to play with a "car toy" at home and showed misunderstanding of the caregiver's explanation.

Similarly, the topic change findings among ASD participants match the results given in Prutting and Kirchner's work (1987). In their research, 81% of instances of the aspect parameter were deemed suitable.

### **4.2.3 Turn Taking**

#### **4.2.3.1 Conversational Initiation/Response**

A productive communication demands a harmony between specificity and simplicity, remaining on topic and diverting according to the context requirements, and asking and responding to questions. It demands the speaker to be attuned to nonverbal listener responses. The hallmark social skill deficiencies of autistic individuals are apparent at a young age and are frequently indicated by an inability to engage in regular back-and-forth conversations, anomalies in body language and eye contact and difficulties in comprehending gestures (American Psychiatric Association, 2013). Autistic children rarely start social connections and demonstrate such little social exchange (Odom & Strain, 1986). The lack of response to social engagement frequently prevents peers from initiating interactions (Odom & Strain, 1986).

As stated in the preceding section, autistic individuals frequently demonstrate

communication problems, including the struggle to maintain a conversation and difficulty with social interactions (Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition; American Psychiatric Association, 2010). Autistic children typically have minimal verbal abilities and find it challenging to react to verbal initiation (Jones & Schwartz, 2009; Nadig et al., 2010). Replying to communicative initiation involves both verbal as well as non-verbal responses provided by a person to answer or explain the speaker's initiation and maintain a cooperative engagement with the speakers (Casenhiser et al., 2015). Prior study has demonstrated that autistic children are incompetent at reacting with linguistic knowledge (verbal replies to conversations), although they are capable (in very small numbers) to reply with head nodding and head shaking (nonverbal reactions) (Capps et al., 1998). Specifically, autistic students frequently have difficulties responding verbally to a conversation (Jones & Schwartz, 2009; Nadig et al., 2010). A widespread agreement that ASD individuals suffer with "social" or "intersubjective" components of language in use. For example, they keep failing to provide meaningful, novel, and pertinent conversations and to react to topics (Capps et al., 1998; Surian et al., 1996; Eales, 1993; Tager-Flusberg and Anderson, 1991; Perner et al., 1989; Baltaxe, 1977).

The current study is consistent with earlier findings. As previously mentioned, children demonstrated a high frequency of absence of both Conversational Initiation/Response with a percentage of 69.23% and 53.85 % respectively. Three participants' conversational responses were comparable to those of normal child development. The explanation shows that the parents of the participants spent so much effort to ensure that their children exhibited the appropriate response based on context. Nevertheless, they stated that there may be times when the children do not respond in any way and appear completely autistic. As shown by neurobiology, neuroimaging results suggest abnormal brain responses to speech in autistic individuals. Children with autism having impaired linguistic and speech skills demonstrate temporal cortex

hypoactivity while language listening (10) and impaired functional connectivity across components of the linguistic network (11). Functional MRI (fMRI) research has shown higher rightward asymmetry as well as decreased functional lateralization in the course of a number of language processing tasks in autistic individuals, contrasted to the leftward asymmetry reported in typically developed participants (12–17). The findings of Prutting and Krichner support those of the current investigation (1987).

#### **4.2.3.2 Conversational Repair/Revision**

Language produced by humans is comparable to many non-human animal communication systems in the way that it employs techniques to avoid misunderstandings. In fact, a communication system without a way to check the signal's validity would eventually become ineffective as inaccuracies piled up and impeded further transmission. Human language is distinctive because the error-correcting system is reactive, enabling users to indicate that a message is not transmitted effectively and to work jointly to repair the discourse at hand. Schegloff et al. (1977) initially established the idea of "repair and revision" when they assembled the seemingly separate research of phenomena like "speech disfluency" and "requests for repetition/clarification". They argued that every one of these study areas focused on the resolving of conversational errors. "Repair" is so crucial to human language and, by extension, to the entirety of the human experience (Brinton et al., 1986). According to Gallagher (1981), "Repair abilities" are a crucial component of the pragmatic communicative competence of the speakers. Individuals in any interaction must also evaluate the extent of their "common ground" with one another and have the ability to identify and address misunderstandings when they arise.

Pause Time and Conversational Repair/Revision are completely absent parameters in the participants' speech. In every engagement, conversational breakdowns and the requirement for repair are inevitable. Regarding the present research, available literature has

indicated that normal occurrences of child-parent or child-teacher interactions have been documented. Considering that repair would not have a tendency to occur in discussions, the researcher invited parents and teachers to simulate a speech breakdown and request clarification from the child. This would allow the researcher to examine participants' communication repair. Unfortunately, the component was absent from the speech of every child, with the exception of one child who, out of fear of punishment, attempted to demonstrate repair.

Conversational repair represents one of the areas in which speakers' theory of mind emerge (Baron-Cohen, 1999) i.e., a level of social intelligence which enables and encourages individuals to monitor inconsistencies in states of understanding and knowledge between oneself and the others; as well as the processes of initiated repair by others that offer a universally held set of strategies for the engaging accomplishment of shared understanding. As per the theoretical framework of 'theory of mind', autistic individuals exhibit difficulties in recognising the presence or absence of states of mind in others. Consequently, they would not be able to determine what may have gone wrong in an initial communication. As a result, they might be incapable of producing a viable repair.

#### **4.2.3.3 Pause Time**

While individuals communicate, pauses are unavoidable. Individuals cannot converse continuously (Zellner, 1994). The rationale of pauses could be that individuals pause to inhale, talk for so long as the lungs capacity permits, and afterwards pause to inhale once again. Breathing is a physiological need, yet speakers also stop for cognitive reasons. Research conducted by Howell and Sackin (2001) demonstrates that when speakers are trained to avoid quiet intervals, they increase function word repetition. On the basis of this, one may claim that speakers stop not just for breathing, but also to acquire time to, for instance, prepare what they are about to say. Goldman-Eisler was among the first researchers to study pauses, particularly their cognitive roles.

The pauses in a conversation carry significance. For instance, when a person spends a long time to respond to anything that has been said, this behaviour may be misinterpreted as lack of interest or disagreement, although it may just indicate that the person is pondering what to say or finding it difficult to express themselves. According to the New Oxford American Dictionary, Third Edition, silence is "complete absence of sound" or "the fact or state of abstaining from speech," while a pause is "a temporary stop in action or speech." According to Fors (2015, p. \*), a pause is "a silence that occurs during an ongoing conversation, and during a speaker's turn or at a turn change."

From a perceptual perspective, speaking might be described as "the outstanding figure over a background – silence" (Gallardo 2006, pp. 120-121). Aside from the silence that marks the start and finish of a conversation, there are a substantial percentage of pauses which succeed one another all along discursive flow and have various purposes. For instance, they may be employed to allow for breathing in the course of the emission or to prepare the next discourse. According to the aims of each investigation, research on "pauses" in oral engagement has adopted diverse methodologies and taken on a more sociological, psychological, or linguistic orientation. The study of "pauses" in spontaneous conversations has a long history in clinical linguistics area as well as and has dealt with several illnesses (Wingate, 1984; Spitzer et al., 1994; Tapia-Ladino, 2003; Nordness et al., 2010; Rosen et al., 2010; Beltrame et al. 2011; Tjaden and Wilding, 2011; Feenaughty et al. 2013).

In the current study, the researcher experienced disrespectful conversational pause patterns in all interactions among all respondents, with no exception. This disparity might be explained by the need for more explanation, difficulties with language understanding, or loss of interest and focus throughout conversational exchanges. Consequently, such tasks are associated with psychological silence, which symbolises the effort that the children make to mentally prepare their replies before speaking (Bruneau 1973). This act is strongly associated

with 'activation', or the linguistic choice that follows the verbal output (Jensen 1973).

#### **4.2.3.4 Interruptions/ Overlaps**

As 'interruption' is seen as a breach of so-called 'normative turn-taking' behaviours, it is essential to first determine the way turn-taking typically occurs. When considering prosody, syntax, and pragmatics, the individuals are continually attempting to determine whether their time to speak has ended. Typically, this occurs at the ending of a lexical item, phrase, clause, or sentence (Kitzinger, 2008). In any discussion, it is crucial for participants to indicate when they plan to conclude their turns. Sacks et al. have called the moment at which the turn might occur a "transition relevance place" (Pohl, 1996, p. 28).

Overlap may be regarded as "an error in projecting where a speaker is planning to end their turn" (Kitzinger, 2008, p. \*), indicating that overlap is unplanned. Nonetheless, it is essential to emphasise the idea that, from a conversation-analytic viewpoint, the above definitions have indeed been erroneously used in several occasions. Schegloff defines 'overlap' as the phenomenon of numerous individuals speaking at the same moment, and 'interruption' as the initiation of an interference during the turn of another person to speak (Schegloff, 2006). Additionally, Schegloff maintains that overlap in speech is not necessitated by an interruption. A simple illustration would be the simultaneous commencement of speech by two speakers. Providing that there were no preconditions to the dialogue that might have given any of the two speakers the opportunity to speak first, this could be considered overlapping discourse without interruption (Schegloff, 2006). The series of principles governs turn formation, assigns the next speaker's turn, and regulates transfers in order to minimise overlaps and gaps between speakers. Turn-taking requires paying attention to the speaker, anticipating the conclusion of the turn, formulating an answer, and articulating it at the proper time (Corps et al., 2018).

Interruption/overlap occurred with 46.15% as "Always Present", 53.85% as

“Sometimes Present”, and 00% as “Absent”. It indicates that children exhibit this behaviour to varied degrees. In Prutting and Kirchner's research, interruption/overlap was judged to be "appropriate" in 91% of cases. A fact that supports the conclusions drawn from this investigation. According to these studies, the difficulty for children with autism in participating in turn-taking exchanges, especially for social reasons, is the cause (Chiang, Soon, Lin, & Rogers, 2008; Clifford & Dissanayake, 2009).

#### **4.2.3.5 Feedback to Speakers**

In the current research, 76.92% of participants assessed feedback to the speaker as "Always Appropriate" and 15.39% under "Sometimes Appropriate." Only one participant did not have feedback to the listener and seemed extremely careless about the adult's conversation. Auditory feedback corresponds with speakers' feedback. This latter gives information on both the internal signals that regulate speech and the context where others react to what is spoken. Regarding the current study, the investigator has discovered that the vast majority of participants who provide comments in discussion do so with a particular family member. Others who failed to provide input, however, spoke with a member of the study. This may be described in terms of 'familiarity'; children with ASD are more acquainted with either siblings or parents than with their instructors. According to Prutting and Kirchner's (1987) research, this component is always appropriate 98% of the time.

#### **4.2.3.6 Adjacency**

In social life, there are a number of communication patterns, and languages are the primary instrument for conveying messages. Conversation/oral communication is among the kinds of communication. As a social species, humans need interaction with others. Conversation is essential for conveying meaning through communication. Dialogue requires a partner, and among the elements of communication is 'adjacency pairs'. They are statements delivered by two consecutive speakers in a manner that a second utterance is recognised as an

anticipated follow-up to the first (Richards and Schmidt 1983). 'Adjacency pairs' are pairings of spoken statements which are frequently interdependent. They are regarded as an automated chain that is consisted of a first and second component. Such portions are created by the various conversational speakers. When uttering the first half of a pair, the speaker anticipates his interlocutor to promptly pronounce the second part. Question-answer, request-acceptance, thanking-response sequences are the most apparent examples of adjacency pairs. Therefore, adjacency pairs are regarded as one of the components that lead to conversational flow. As a result, there are several factors that contribute to smooth discourse in order to avoid overlaps and gaps between turns throughout an engagement. These features include the organisation of sequence, turn taking cues, and turn taking rules.

In addition, Dobbins et al. (1998) demonstrated that both autistic children and adults have lengthier pauses within and between turns when responding to inquiries. In the setting of 'adjacency pair', like 'question and answer sequence' (Sacks et al., 1974), it has been documented that autistic children exhibit a tendency to postpone their responses to inquiries, as reported by Rendle-Short (2003) and Ochs et al. (2004). While, typically developing older child or an adult would react instantly with little delay (Sacks et al., 1974). In the event of a momentary interruption, the duration of said pause is anticipated to be no longer than one second (Jefferson, 1989). Children with autism spectrum disorder may exhibit delayed response times exceeding one second when answering questions (Rendle-Short, 2003; Ochs et al., 2004). It is difficult to provide a rationale for such delays. One theory is that autistic children would have a deficit in processing the information (Bauminger, 2002). It implies that the children might not have the ability to react that quick to the occurrence of social signals in the discussion, and hence do not "keep up" with what is happening. According to Ochs et al. (2004, p. 162), however, "longer pauses may just reflect a desire to withdraw from the interaction at hand."

#### **4.2.3.7 Contingency**

According to Prutting and Kirchner (1987), "contingency" refers to identical statements that add information to a previous message delivered with the same topic as the prior statement. The issue relates to the Topic Change parameter. Considering ASD children having trouble to maintain a topic and have a propensity to switch topics, this parameter will be 'absent' owing to the topic switching.

The present investigation's results are congruent with the research conducted by Nadig et al. (2010), who examined the percentage of explanations and queries in all statements. The autistic group generated considerably fewer contingent constructions (i.e., constructions that connected to the sibling's previous statement and served to preserve the same topic). Remarkably, the autism group created fewer contingent constructions when discussing their area of interest. It is considered that the relevance of this component in students with ASD was a result of their inability to remain in a given topic and their willingness to reiterate a formerly addressed concept. This was previously stated in the Topic Change component.

#### **4.2.3.8 Quantity/Conciseness**

The capacity to be direct and concise is a crucial component of effective communicative abilities. An excessive amount of rambling and detail causes confusion and frustration among the audience. It diminishes the speaker's credibility. The speaker's image is enhanced by his or her capacity to communicate effectively and simply. The conciseness or amount of discourse relates to brief, to-the-point statements in which a significant amount is communicated in relatively few words.

Echolalia characterises the children of the present investigation. Recent research indicates that echolalia is considered to be a way of coping for autistic children who are unable to make spontaneous speech. Prizant and Duchan (1981) identified echolalia as indication that children with ASD acquire language through "gestalt" process. The bulk of statements,

contributions and even words produced by youngsters who took part in the study lack communicative value. Children, sometimes, repeat extended, meaningless utterances and words heard on television or from their caregivers/parents. Therefore, ASD speaking does not constitute a concise form of communication.

#### **4.2.4 Lexical Selection/Use across Speech Acts**

##### **4.2.4.1 Specificity/Accuracy**

Autism is manifested by deficiencies in social connectedness, communication, and confined, repetitive, as well as stereotypical behavior (Cashin et al., 2009). Breadth and depth of linguistic knowledge are two essential components of a person's lexicon. "Breadth" of linguistic knowledge relates to unidimensional and linear features, whereas "depth" refers to not only meaning of words but also semantic connections, syntactic patterning, and collocations. This latter type of knowledge derives primarily from the subconscious acquisition of words through frequent reading (Cobb, 1999). Understanding merely definitions of words from dictionaries, often referred to as the "breadth dimension", is insufficient for producing significant work. The "depth dimension" refers to one's understanding of the various features of lexical items, including such their different connotations, collocations (Nation 1990).

It is suggested that ASDs frequently exhibit deficiencies both in "breadth and depth" of lexical and semantic knowledge as a result of the aforementioned defective communication triad. The majority of autistic children exhibit a decreased rate of width than ordinary children. In addition to that, they are unaware of the meanings of the majority of the terms they learn as they have learned them via echolalia. Consequently, autistic youngsters are observed to develop relatively shallow speech (Haebig et al., 2015). All youngsters are defined by producing elements that do not correspond to the communications, which is supported by the current research.

#### **4.2.4.2 Cohesion**

Halliday and Hasan (1976, p. 2) defined cohesion as "the set of linguistic means we have available for creating texture", i.e., the interpretable wholeness of a text rather than unconnected sentences. According to them cohesion happens "where the interpretation of some element in the text is dependent on that of another. The one presupposes the other, in the sense that it cannot be effectively decoded except by recourse to it" (Halliday & Hasan, 1976, p.4). It is the link or connection that occurs when the understanding of one linguistic component (say word in one phrase) depends on the interpretation of another textual element (say word usually, however not perform in other sentences). Cohesion refers to the "semantic ties" inside a text, in which a tie is formed if there is an interdependent link between components that work together to create meaning. Halliday and Hasan (1976) distinguished five types of cohesion: (1) reference, (2) substitution, (3) ellipsis, (4) conjunction, and (5) lexical cohesion. In the five major types of coherence, "the interpretation of a discourse element is dependent on another element that can be pointed out in discourse" (Renkema 1993, p. 40).

As Halliday and Hasan (1976) stated, the fundamental components of grammatical cohesion are (1) reference, (2) substitution, (3) ellipsis, and (4) conjunction. Grammatical cohesion refers to the numerous grammatical methods that can be employed to make the relationships between sentences more obvious. The fifth category i.e., Lexical cohesion is just a factor of word selection.

Cohesion as well as coherence deficits in the speech of the children who were part of this study have been widely recognised. In fact, they generated little cohesion in all interactions. Considering cohesive devices which are involved, 76.92% of this parameter's values are "Absent." Some few individuals that provide cohesion adhere to the subject introduced by the caregivers. It is always related to play or routine tasks. While doing so, participants repeat phrases related to this matter, which is seen as an indication of cohesiveness. There are few

instances of the usage of pronouns as well as articles. Except for the use of phrases that go around the same matter, communication produced by autistic individuals lacks any cohesion mechanisms. Although coherence might well be produced by "repetition", a percentage of participants' repeated sounds or sentences lack coherence devices. These repeats are characteristics of the speech of autistic children (American Psychiatric Association, 2013). In brief, repetition is the sole cohesive device detected; neither any cohesiveness is seen. Possible explanations for the disconnect of speech in autistic children include underlying cognitive, linguistic, and social deficits that impede the creation and use of appropriate cohesive links. The results of this study are in accordance with the outcomes reported by Baltaxe and D'Angiola (1992), Fine et al. (1994), and Dalia (2019).

#### **4.2.5 Stylistic Variations**

##### **4.2.5.1 The Varying of Communicative Styles**

The varying of communicative styles relates to the adaptations performed by the speakers in various interactional contexts (e.g., changes in vocal quality, different syntax, polite forms). The significance of developing effective communicative skills at a young age can no longer be defended. Instructors, parents, and youngsters are aware that an effective communicative style not only promotes mutual understanding, but also future professional achievement. When a young child develops communicative skills early in life, they learn to speak in a manner that offers them accomplishment sooner. Style of communication is the collection of a person's speech features throughout the process of communicating. Style refers to distinct methods of hearing and understanding a message, as well as particular ways of conveying a reaction or providing feedback. A person's communicative style reveals how they manage their social relationships. It provides an indication that demonstrates how to analyse information and convert it into active social judgements. Important as well is the incorporation of appropriate styles in contexts, rather than limiting to a single style (Panișoară,

2010). There exist several categories of the style. Everyone has certain characteristics that should be refined. In one research, participants examined the efficiency of various educational activities for strengthening oral communicative skills throughout their college years, as indicated by Jackson (2014).

According to Mody and Belliveau (2013), autism is characterised by interactional, communicative, and social deficits. Social dysfunction is a basic feature of autism. Autism is usually associated with immediately apparent problems in social relations. Most crucially, the deficiency in social skills makes it challenging for the individuals to establish and maintain fulfilling and meaningful personal connections. Such social communicative skills need an awareness of complicated society's expectations as well as the capacity to self-regulate relying on this comprehension. Individuals with ASD often fail to possess these skills.

Regarding communication styles of language, it was shown that politeness is the most important social skills used by children with autism. It is a kind of communication that conveys care and reduces challenges to self-esteem, Brown and Levinson (1978). In the current research, the author of the study observed that ASD children displayed a variety of politeness strategies. These were conveyed in thanking, greetings, requests for permission to use items, and so on. Teachers used both verbal and nonverbal strategies of politeness, as shown by the findings. These were used to facilitate the transmission of skills to autistic children. The results concur with those of Sirota (2004). She investigated whether children with ASD use politeness strategies such as compliments and greetings. The findings of her research indicated that participants often employed face-to-face settings in which adults conversed with an autistic child. As per the results of Li et al. (2011), it was observed that children diagnosed with autism spectrum disorder exhibit the use of politeness forms, including but not limited to polite acceptances and rejections.

## **4.2.6 Intelligibility and Prosodics**

### **4.2.6.1 Intelligibility**

According to the definition put forward, intelligibility refers to how well a listener is able to reconstruct an auditory signal that was originally produced by the speaker. The speaker (who generates a message) as well as the listener (who receives it) work together to achieve intelligibility, and its evaluation represents their combined effort. It is not necessary for speech to be flawless and even "normal" for it to be intelligible. Even if some speech components are flawed, the final result may still be understandable. Listeners' ability to simulate an acoustic signal into intended lexical items, despite the presence of production faults or inconsistencies in the speech signal, is the central challenge in intelligibility (Kent et al., 1989). The theoretical and clinical implications of intelligibility in speech disorders literature have been extensively explored. However, this aspect of language acquisition has been the subject of far less research. Indeed, there is a dearth of literature on children's intelligibility, and much less on the normative expectations for intelligibility as they grow up.

Communication issues are prevalent among autistic children. Autism-afflicted individuals typically display weak social interaction skills. One-third to one-half of people with autism lack the requisite natural abilities in speech to meet the everyday communication requirements. Communication issues are generally rooted in language and speech. Several children with autism suffer from unintelligible speech. Despite their ability to generate sufficiently loud sounds, the listener cannot comprehend their message (Boyd et al., 2017). Participants in the current study were found to be "sometimes intelligible" with speakers at a rate of 69.23%, which suggests that the participants do not exhibit severe deficits in language structure. Numerous studies demonstrate that autistic individuals exhibit typical semantic processing and, hence, do comprehend speaker's discourse (Prutting and Kirchner, 1987; Loveland and Landry, 1988; Lord et al 2004). These results cannot rule out the possibility

that autistic individuals struggle with understanding the language and social signals.

#### **4.2.6.2 Vocal Intensity/Vocal Quality and Prosody**

It is widely recognised that autism spectrum disorder is, among other things, characterised by prosodic modifications (Thurber and Tager-Flusberg, 1993; Shriberg et al., 2001; Niemi, 2008; Rodriguez-Muoz, 2009a, 2013a; Heikkinen et al. 2010; and Diehl & Paul, 2013). Such anomalies were linked to tempo, rhythm, intonation, and loudness (Baltaxe, 1981; Gillberg & Gillberg, 1989).

Speech and vocalisations constitute socially oriented cues that are easily processed by the human brain throughout interpersonal communication and interactions (Abrams et al., 2013). Neuroimaging investigations have revealed certain regions within the adult human brain that are not only considered as sensitive, but also highly selective to human voice (Belin et al., 2000). Temporal voice areas (TVAs) are clustered throughout the length of the middle as well as anterior portions of the right hemisphere's superior temporal sulcus (Belin & Grosbras, 2010). The TVA's cerebral specialisation begins to emerge around 04 and 07 months old in typically developing newborns (Grossmann et al., 2010), that coincides with the 'myelination' period of the initial auditory cortex - approximately 06 months old, indicating an accelerated systemic reform that endorses the specialisation for vocal encoding in the first year of living (Belin & Grosbras, 2010). The precise stimulation of TVAs to human vocalisations as opposed to non-social found naturally sounds, including such car noise, leaf rustling, as well as a well-matched acoustic control (Belin et al., 2004), implies a specific contribution of such cortical regions for the encoding of social relevant verbal data, including such human speech and vocalisations (Shultz et al., 2012). In addition to vocalisations, vocal intensity and quality differentiate diverse syntactic patterns. To use a rising intonation at the conclusion of a declaratory syntactic structure, for instance, to indicate that it should be regarded as a query as opposed to an assertion, is accomplished via the quality and intensity of utterance (Landa,

2007).

Prosodic differences separate declarative statements from interrogatives. It reveals the emotional state of the speakers and marks the beginning and finish of words and sentences. Since the original description of ASD, the literature has identified variations in prosody in the speech of those with ASD (Kanner, 1943). To date, nothing is understood about the perception of the prosody of these persons or the precise characteristics of their prosodic compositions that resulted in the interlocutor's experience of strangeness (Paul et al., 2005).

Since the beginning of ASD categorization, the following prosodic characteristics have been seen and outlined: monotone or robotic speech, difficulties with pitch use (frequency) or controlling the volume (intensity), deficits in voice quality, and usage of unique stress pattern (Paul et al., 2005). It is to be noted that all these prosodic variations are enduring and have changed little through time, even while other components of language have evolved (Paul et al., 2005). Literature reveals significant discrepancy about the unique prosodic processes of persons with ASD, in addition to some confusion regarding its potential to aid criteria for diagnosis, that remain questionable (McCann & Peppé, 2003). The DSM-IV signs and symptoms only specify aberrant intonation, timbre, rhythm, velocity, and emphasis (for example, the voice tone may be monotonous or elevated interrogatively at the conclusion of affirmatives) (American Psychiatry Association, 2002). Based on the previously indicated criteria of diagnosis, several studies additionally identify weak prosody as well as monotony in intonation as essential features of output and defining characteristics of the speech of persons with ASD (Gadia et al., 2004).

Klin (2006) emphasizes that autistic individuals often demonstrate a limited range of intonation patterns that have no relevance to the communication purpose of the utterance (e.g., factual claims, amusing observations). With regard to this context, prosody is suprasegmental encompassing two components: (1) Production, which is characterised by

three main dimensions: (a) duration; difference between two events, (b) fundamental frequency, as well as (c) intensity; and (2) Perception, which is characterised by (a) conceptions of presumed length, (b) height, as well as (c) volume (Vieira et al., 2004).

The investigation within the domain of speech production, including such Campisi et al. (2005); Hamzavi et al. (2000); Higgins et al. (1999); Lane et al. (1997); Monini et al. (1997); Perkell et al. (1992); Svirsky et al. (1992); Leder et al. (1987) as cited in Russo et al. (2008), establish solid connection across speech production and auditory feedback in ASD children. They demonstrate the importance of auditory input for voice volume and pitch control. In this research, a reduction in auditory feedback has indeed been gradually recorded in ASD patients. Other research supporting these findings on speech production are Bidet-Caulet et al. (2017) and Gervais et al (2004).

#### **4.2.6.3 Fluency**

The word "fluency" has been the subject of interminable linguistic discussion and innumerable meanings. Though linguistics has not agreed on a precise unified definition of this term, a general view is that linguistic fluency is achieved whenever the speaker can express himself with confidence, ease, and accuracy in the language. Important components of fluency include pauses, speed, proper expressions, repairs, and degree of understanding. There may be vocabulary gaps, however a proficient speaker may quickly deduce the meaning from its context or make their point by clarifying, rephrasing, or explaining the obscure term (Study.com, 2017).

The concept fluency is described as the capacity to utilise language rapidly and with confidence, with no hesitating or pausing unnaturally that may create communicative obstacles (Bailey, 2003; Byrne, 1986). According to Shahini and Shahamirian (2017), fluency is one of the most important aspects of communicative ability. It is seen as a significant measure of 'language learning' progress (Chambers, 1997), as well as one of the elements that guarantee

communication success (Gorkaltseva et al., 2015).

According to Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), autism is a neurodevelopmental disorder that is distinguished by two primary features: (1) persistent deficiencies in social interaction as well as communication across diverse contexts, and (2) the presence of restricted and repetitive patterns of behaviour, interests, or activities (American Psychiatric Association [APA], 2013).

The hypothesis of 'executive dysfunction' is one of the suggested theoretical frameworks to understand the disorder (Hill, 2004; Ozonoff, 1997). Taking into account this theory, ASD individuals might display a deficiency in the executive functions, which are defined as a series of cognitive activities responsible for expecting and achieving goals, planning and programming, initiating activities and intellectual processes, time organisation and scheduling, comparing, categorization and classification, regulation of tasks by one self, as well as the capacity for carrying them out efficiently (Lezak et al., 2004).

Among the cognitive functions comprising executive functioning (EF) is Generativity, or the capacity to produce new replies, which has often been evaluated employing verbal fluency (VF) assessments. VF is described as the ability to generate verbal replies spontaneously without significant pauses or word-searching blunders (Butman et al., 2000). Based on the researchers, VF activities are tasks of linguistic production that demand the respondent to create words starting by a specified letters (lexical / phonemic tasks) or words that are examples of a specific class (semantic tasks) within a given amount of time. Such tasks involve the activation of processes to reach the stored lexis in semantic long-term memory, linguistic generativity, and additional cognitive abilities like sustained attention, focused attention and verbal short-term memory, organisation, inhibition of inappropriate responses, monitoring, cognitive flexibility, strategic search, and processing speed. In particular, semantic verbal fluency tests (SVF) is a cognitive assessment tool that involves

prompting the participant to generate a maximal number of words that pertain to a particular semantic category, (e.g., fruits, animals, occupations, kitchen items) in a given amount of time (often 60 seconds). Even though, the performance on such sorts of tasks has frequently been assessed primarily upon the overall number of right words generated within the allotted time frame, specific markers of the cognitive methods utilised to effectively complete these fluency tests have also been employed in certain research (Kosmidis et al., 2004). Therefore, while creating terms on a semantic verbal fluency task, typical individuals generate related words and afterwards, whenever the semantic subgroup is saturated, they transition towards another subgroup (Troyer et al., 1998).

A fluency disorder is a disruption in the typical rhythm and pace of spoken language characterised by anomalous rhythm, rate, and disfluency (e.g., sound prolongations; repetitions of phrases, words, syllables, and sounds; as well as blocks), that could be associated by excessive tension, struggle behaviours, secondary mannerism, and speaking avoidance (American Speech-Language-Hearing Association [ASHA], 1993). The most prevalent fluency issue, (1) stuttering, is a halt in the speech flow defined by certain forms of distortions, including:

- ✓ Repeated sound, syllable, and monosyllabic word (such as "Take the b-b-bag" and "Let's go eat-eat-eat");
- ✓ prolongation of sounds that are not for emphasis (e.g., "Sssssssssssometimes we go out")
- ✓ blocks (i.e., silent or inaudible fixation or incapability to start producing a sound).

(Iverach et al., 2016; Boyle, 2015; Craig & Tran, 2014; Iverach & Rapee, 2014).

A further speech fluency disorder, (2) cluttering, is characterised by a demonstrated irregular and/or rapid rate of speech, anomalous silences, maze behaviours, pragmatic issues, increased disfluency, reduced consciousness of fluency difficulties or instances of

disfluency, omitting or collapsing syllables, as well as issues in language formulation, that result in failures in the clarity of speech and/or fluency (van Zaalen & Reichel, 2014; Louis & Schulte, 2011). People may demonstrate either plain cluttering or cluttering accompanied by stuttering (van Zaalen et al., 2009).

This deficiency is explained by the notion of executive functioning. As stated above, executive functions refer to a set of skills necessary the successful execution regulating efficient, goal-oriented, future-oriented behaviour within a dynamic context. In accordance with our expectations, the autistic children of the current study had decreased activity during fluency. They performed poorly (Absent Aspect) in terms of semantic fluency with a score of 76.92%.

#### **4.2.7 Kinesics and Proxemics**

Despite the fact that mind communicates immediately, humans' face-to-face communication occurs via the bodies. Nonverbal conduct, such as a hand flip, averted gaze, gestures, facial expression, proxemics, body language, or posture may have a significant impact on communication. Such actions are so widespread throughout the whole conversation that their absence indicates something is amiss (Rodríguez-Muoz, 2013).

##### **4.2.7.1 Physical proximity, Physical Contacts, and Body Posture**

Individuals regulate the spacing among themselves and each other during social engagement. When another individual invades their personal space, they may feel uncomfortable and retreat (Kennedy and Adolphs 2014). ASD is considered to be a neuro-developmental syndrome characterised by persistent Challenges encountered in social interaction. Children with autism may not establish appropriate "social distance"; they may position themselves in close proximity or at a distance that is too far from the intended target. (American Psychiatric Association [APA], 2013).

The findings revealed that the autistic participants in the current study fall into three distinct categories: five children out of 13 were sitting at a regular distance, respecting the space

between the experimenter and themselves; three children were observed in close proximity to the experimenter, positioned "nose to nose", while an additional five children were observed at a considerable distance from the experimenter. In an attempt to explain these disparities, it was shown that the participants who manipulate personal space management have previously been exposed to the external world (they attend schools), and so establish interactions with strangers. The three youngsters who choose to converse with their parents are the ones who tend to stand nose-to-nose. However, the youngsters who choose to stand very far away were engaged in conversation with their instructors. Numerous research has revealed that the amount of personal space changes according on the 'social setting'. An individual in a possibly hostile environment will possess a larger personal space, while an individual in a group of friends would have a smaller personal space (Dosey & Meisels, 1969; Felipe & Sommer, 1966). In addition, the extent of social distance might vary based on parameters such as gender (Lomranz et al., 1975), age (Aiello, 1987), child-caregiver connection (Cassidy & Berlin, 1994; Bar-Haim et al, 2002), and acquaintance among parties involved (Watson, 1970; Cristani et al., 2011). Similarly, it is stated that autistic children exhibit reduced sensitivity to close proximity to a stranger and desire a greater social distance.

In addition, previous research has revealed that an overactive amygdala could be responsible for aberrant worries and heightened anxiety in autistic children, resulting in decreased social relationships and unconfident conduct in these individuals (Cristani et al., 2011; Swartz et al., 2011). A prior neuroimaging study suggested that the amygdala performs an essential part in controlling personal space (Kennedy, 2009), whether by provoking instinctive emotional responses in reaction to violations of personal space or by having to learn the correlation among both aversive outcomes and close distance. Inferring from the prior findings and the current ones, the researcher proposes that the intolerance of physical proximity with strangers and the inability to adjust personal space in children with ASD could be the

outcome of a dysfunctional amygdala-based process. Several facts support the validity of this idea. New research shows that the amygdala is larger in autistic children (Schumann, 2009), which may explain the anomalies of anxiety and fear that seem to be a hallmark of autism. A hyperactive amygdala may explain the autistic population's heightened autonomic reflexes.

In conclusion, fear and discomfort of physical proximity with other individuals may be among the most influential elements in controlling personal proximity during social engagement (Argyle & Dean, 1965). It is found that children with ASD keep a greater and more strict distance from strangers, indicating that they are hypersensitive and less tolerant to invasions of private space. In autism spectrum disorder in children, it is hypothesised that these effects may result in part from augmented rather than diminished amygdala activity.

#### **4.2.7.2 Foot/Leg and Hand/Arm Movements**

Many investigations have documented the existence of movement disorders in people having ASD, including ataxia (Fatemi & Folsom 2013), akinesia, dyskinesia, bradykinesia, Tourette syndrome-like symptoms, and catatonic-like symptoms (Breen & Hare, 2017; Donnellan et al., 2013), with cerebellum and basal ganglia dysfunction (Nayate et al., 2005), hence leading most research to speculate that ASD is, at least partially, a movement disorder (Nayate et al., 2005).

In previous research by (Umesawa et al., 2020), the authors examined and contrasted  $\gamma$ -Aminobutyric acid (GABA) concentration in both the primary motor area (M1) and supplementary motor area (SMA) of autistic individuals and normal ones using the non-invasive neuroimaging technique of <sup>1</sup>H-magnetic resonance spectroscopy (<sup>1</sup>H-MRS). this technique is capable of estimating the amounts of certain neurotransmitters and chemical metabolites in vivo (Jansen et al., 2006). GABA serves as the principal inhibitory neurotransmitter within the human brain, and it plays a critical function in controlling neuronal activity (McCormick, 1989). Researchers discovered that individuals with ASD who had lower

GABA concentrations in the SMA had less developed motor coordination. These results suggest that low levels of GABA within the SMA could potentially contribute to the severe directional limitations experienced by people with ASD.

Based on empirical observations of the study participants, the author of the study concluded that all children, without any deviation, exhibit symptoms of movement disorders. It is imperative to acknowledge that not all the participants exhibit identical gestures. A number of the participants move their arms and legs, some move their heads, others flap their arms, and yet others touch their bodies or clothing. In this regard, physical movements are a pragmatic feature that every autistic kid has. When evaluating 42 children having language issue, Prutting and Kirchner (1987) found that the results for foot/leg and hand/arm movement are highly congruent. The entirety of their research indicated that this physiological stereotype was accurate. (41% of children with a verbal problem experienced physical motions).

#### **4.2.7.3 Gestures and Facial Expressions**

According to Kelly et al. (2002), it is suggested that the merging of language and movement gives more insights into child's knowledge and comprehension as compared to either language or movement alone. Feyereisen and de Lannoy (1991) define gesture as "any kind of movement performed during speaking" (p.4). Gestures "may provide a window onto knowledge that is not readily expressed in speech" (Alibali et al., 1999, p. 327).

According to the National Institute on Deafness and Other Communication Disorders (NIDCD) Fact Sheet (2012), autistic children exhibit inadequate nonverbal communication abilities. They are often incapable of using gestures, such as indicating an item, to clarify the words. They frequently refrain from eye contact, which may render them seem impolite, disinterested, or indifferent. Not having the ability to communicate via significant gestures or words, several ASD children grow confused while attempting to express their emotions and needs. 84.61% of the participants in this study lacked this skill. In autistic individuals,

communication development is hindered and marked by the presence of impairments. As a result of inadequate proficiency in speech acts and turn-taking, the participants in the current study displayed poor performance in terms of gestures during talks. Prutting and Kirchner support these findings (1987).

Facial expressions, along with gestures, fall under the category of nonverbal communication; these allow a person to convey meaning by moving their eyes, eyebrows, mouth, and other face muscles. Whilst wide eyes and an open mouth might convey surprise or terror, a smile on one's face can convey approbation or affirmation. A frown might be read as a sign of worry or concern, whereas a grin can signify happiness. Facial expressions are a powerful means of communication because they allow us to read a person's emotions and so better comprehend what they are trying to say (Study.com, 2022).

Children with autism produce facial expression less frequently and over a shorter length than children without autism. This suggests that the facial expressions of autistic individuals are less reliable and of lower quality. The current study found that ASD individuals' facial expressions were "sometimes appropriate"; with 38.46% "appropriate" and 46.15% "absent". In accordance with this perspective, various research indicate that observers/experimenters evaluate the spontaneous facial expressions of autistic individuals as being of lesser quality and as being weird, mechanical, or stilted. When compared to non-autistic children, autism spectrum disorder youngsters replicate facial emotions less precisely (i.e., with lesser consistency to the expression being imitated, e.g., a group may smile with a wider mouth to convey greater joy). Consequently, it shows that autistic individuals have the physical ability of copying facial emotions; yet, when they do so, their mimicry is of inferior quality.

#### **4.2.7.4 Eye Gaze**

Keeping an eye contact throughout the process of communication, assuming both parties are present physically, is an excellent method for ensuring that the process is not impeded.

Maintaining eye contact throughout the speech process is indicative of attentive listening. Several endophenotypes, including variations in motor delay, attentional disengagement, and sensory disturbance, may be connected to ASD development (Constantino et al., 2021; Johnson et al., 2015, 2021; Klin et al., 2020; Tiede & Walton, 2020; Varcin & Nelson, 2016). Nevertheless, utmost reliable early indicator of autism is abnormalities in social attention, namely diminished eye gaze (Klin et al., 2020; Tiede & Walton, 2020).

For decades, there has been much attention in decreased eye gazing as a possible endophenotype of ASD (Klin et al., 2020; Tiede & Walton, 2020; Itier & Batty, 2009; Schultz, 2005; Phillips et al., 1992). Young babies have a natural inclination for face (Valenza et al., 1996; Goren et al., 1975), and the eye part particularly attracts their focus (Batki et al., 2000). In opposition to typically developing infants, however, newborns eventually diagnosed with autism demonstrate reduced tendency towards facial gazing and exhibit diminished levels of eye contact and gaze following behavior (Riby et al., 2009; Merin et al., 2007; Leekam et al., 1998). In point of fact, a decline in eye gaze during the first half-year of an individual's life is significantly associated with subsequent social impairments (Jones & Klin, 2013). Eye gazing is undoubtedly essential for the growth of social abilities and more advanced social-cognitive skills, including perspective taking and theory of mind (Stephenson et al., 2021).

According to Adams & Nelson (2016), the eye is a vital source for obtaining social knowledge. In fact, eye-contact increases the capacity to deduce states of mind. It is additionally essential for the start of collaborative attention (Hamilton, 2016), which enables individuals to exchange experience. Significantly, eye contact communicates a willingness to connect with the other (Mundy & Newell, 2007), so enhancing possibilities for communication, attachment, and socialisation. Throughout one's entire existence, data contributes to the function of eye gazing in social evolution in both neurotypical and clinical groups. Eye movements and the ability to use eye gaze to initiate social engagement in infancy connect favourably with the later

social development understanding and social abilities (Vaughan Van Hecke et al., 2007). Intriguingly, a new study shows that young children visually impaired have linguistic, communicative, and social issues in their second and third years of childhood, as well as a disproportion percentage of them display stereotypical behaviour (Vervloed et al., 2020). This is likely that restricted accessibility to visual source of social knowledge contributes to social issues in children with vision impairment. Adults who maintain eye contact are better able to absorb social data and develop social competencies. For instance, the length of eye contact in naturalistic settings “real life” circumstances corresponds favourably with social skills and emotions perception reliability of adult individuals (Hall et al., 2010; Cherulnik et al., 1978), while eye gazing is also associated with improved face identification recall (Davis et al., 2017).

In the meanwhile, research on autistic individuals has identified a correlation between decreased visual focus on the eye area as well as increased social impairments (Jones et al., 2008; Speer et al., 2007). Whereas the importance of eye gazing in the development of ASD has garnered considerable focus, hypotheses on the mechanism behind disparities in eye contact are contradictory. A notable interpretation would be that 'social stimuli', particularly the face and eye of the others, may be less pertinent for ASD individuals (Klin et al., 2002; Baron-Cohen et al., 2000; Weeks & Hobson, 1987) due to their lower reward (Chevallier et al., 2012; Grelotti et al., 2002) as well as/ or less providing useful or interesting information (Grelotti et al., 2002; Baron-Cohen et al., 1997). The amygdala hypothesis posits that individuals on the autism spectrum exhibit reduced activation of the amygdala, resulting in a decreased emphasis on the face and eye regions compared to typically developing individuals. This neurological-based theory suggests that individuals with autism spectrum disorder perceive these facial features as less significant (Baron-Cohen et al., 2000). Nevertheless, an even more recent theory contradicts this one. Tanaka and Sung (2013) examined data of face-processing problems in autism and suggested the 'eye avoidance theory' of ASD. According to Tanaka and Sung's

(2013) proposition, individuals with autism spectrum disorder experience a considerable degree of aversive amygdala-mediated arousal in relation to gaze behavior, leading them to adopt a strategy of eye aversion as a means of mitigating this arousal. As per the findings of recent meta-analyses encompassing whole brain functional magnetic resonance imaging (fMRI) studies, individuals diagnosed with autism spectrum disorder exhibit considerably lower levels of amygdala activation in comparison to their neurotypical counterparts during the processing of facial information (Costa et al., 2021). Despite the fact observed that certain children were making appropriate eye contact, a large number of participants demonstrated difficulties sustaining social connection via eye gazing.

### 4.3 Pragmatic Skills Distribution according to Prutting and Kirchner Protocol (1987)

#### 4.3.1 Verbal Acts

The subsequent table displays the findings of verbal acts exhibited by children in accordance with Means and Standard Deviations. These are used to determine if there are disparities in the verbal pragmatic skills produced by autistic children.

**Table 13**

*Occurrence of Verbal Pragmatic Parameters according to Prutting and Kirchner Protocol (1987).*

Verbal Act Aspects	Weighted Mean	Standard Deviation	Assessment Degree
<b>Speech Acts</b>			
Speech Act Pair Analysis	3,3077	0,85485	<b>ALWAYS APPROPRIATE</b>
Variety of Speech Acts	2,7692	0,83205	<b>SOMETIMES APPROPRIATE</b>
<b>Topic</b>			
Selection	2,8462	0,89872	<b>SOMETIMES APPROPRIATE</b>
Introduction	2,1538	0,55470	<b>ABSENT</b>
Maintenance	2,3846	0,65044	<b>ABSENT</b>
Change	<b>3,6923</b>	<b>0,48038</b>	<b>ALWAYS APPROPRIATE</b>
<b>Turn-Taking</b>			

Initiation	2,3846	0,65044	<b>ABSENT</b>
Response	3,4615	0,51887	<b>ALWAYS APPROPRIATE</b>
Repair / Revision	2,3077	0,63043	<b>ABSENT</b>
Pause Time	2,1538	0,55470	<b>ABSENT</b>
Interruption/ Overlap	3,4615	0,51887	<b>ALWAYS APPROPRIATE</b>
Feedback to Speakers	3,0769	0,49355	<b>SOMETIMES APPROPRIATE</b>
Adjacency	2,6923	0,48038	<b>SOMETIMES APPROPRIATE</b>
Contingency	2,3846	0,50637	<b>ABSENT</b>
Quantity/ Conciseness	<b>2,0769</b>	<b>0,49355</b>	<b>ABSENT</b>
<b>Lexical Selection/Use Across Speech Acts</b>			
Specificity / Accuracy	2,5385	0,77625	<b>SOMETIMES APPROPRIATE</b>
Cohesion	2,3077	0,63043	<b>ABSENT</b>
<b>Stylistic Variations</b>			
The Varying of Communicative Styles	2,6154	0,76795	<b>SOMETIMES APPROPRIATE</b>

Regarding Verbal Aspects, the preceding table demonstrates:

- The range for all pragmatic parameters is (Mean:2.07-3.70/Standard Deviation:0.50).  
Notably, the assessment degree exhibits a range of appropriateness, including instances of appropriate, sometimes appropriate, and absent evaluations.
- The variable exhibiting the greatest mean value is "Topic Change" (M:3.70/Std:0.50).  
This variable was consistently assessed as "Always Appropriate" by the investigator.
- The variable exhibiting the lowest mean is Turn Taking "Quantity/Conciseness", which was found to be (M: 2.07/Std:0.50) and evaluated as "Absent".

In general, clusters of "verbal acts" are evaluated to varying degrees:

- The evaluation of speech acts indicates a consistently high level of appropriateness, as evidenced by a weighted mean (M: 3.03/Std: 0.84).
- The evaluation of Topic, Turn Taking, as well as Stylistic Variations indicates that they

are sometimes appropriate, with a weighted mean falling within the range of (M:2.77-2.66-2.61/Std:0.64-0.54-0.78).

- The evaluation of Lexical Selection/Use across Speech Acts indicates an absence thereof, with a weighted mean (M: 2.42/ Std: 0.70).

#### 4.3.1 Paralinguistic Aspects

The findings of participants' paralinguistic skills are shown in the below table:

**Table 14**

*Occurrence of Paralinguistic Pragmatic Parameters according to Prutting and Kirchner Protocol (1987).*

<b>Pragmatic Aspect</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Degree of assessment</b>
<b>Intelligibility and Prosodics</b>			
Intelligibility	<b>3,2308</b>	<b>0,59914</b>	<b>SOMETIMES APPROPRIATE</b>
Vocal Intensity	2,8462	0,55470	<b>SOMETIMES APPROPRIATE</b>
Vocal Quality	3,0769	0,64051	<b>SOMETIMES APPROPRIATE</b>
Prosody	2,6154	0,65044	<b>SOMETIMES APPROPRIATE</b>
Fluency	<b>2,3077</b>	<b>0,43043</b>	<b>ABSENT</b>

Considering paralinguistic parameters, the given table demonstrates:

- The assessment of intelligibility as well as prosody has yielded a rating of "Sometimes Appropriate", with a calculated mean of 2.81 and a standard deviation of 0.57.
- The pragmatic characteristics within the group of intelligibility and prosody have a significant range of means (M: 3.23-2.30/Std: 0.43-0.63), with the exception of fluency, which is Absent in every participant

#### 4.3.3 Non-verbal Aspects

The findings of the children's non-verbal skills are provided in the table below.

**Table 15**

*Occurrence of Non-verbal Pragmatic Parameters according to Prutting and Kirchner Protocol (1987).*

<b>Pragmatic Aspect</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Degree of assessment</b>
<b>Kinesics and Proxemics</b>			
Physical Proximity	2,8462	0,37553	<b>SOMETIMES APPROPRIATE</b>
Physical Contacts	2,6923	0,48038	<b>SOMETIMES APPROPRIATE</b>
Body Posture	2,5385	0,51887	<b>SOMETIMES APPROPRIATE</b>
Foot/Leg and Hand/Arm Movements	<b>4,0000</b>	<b>0,00000</b>	<b>ALWAYS APPROPRIATE</b>
Gestures	<b>2,3077</b>	<b>0,48038</b>	<b>Absent</b>
Facial Expression	2,7692	0,72501	<b>SOMETIMES APPROPRIATE</b>
Eye Gaze	3,0000	0,70711	<b>SOMETIMES APPROPRIATE</b>

The aspects of non-verbal category conclude the "pragmatic protocol". Its findings are provided in the section immediately above:

- Overall, the study of nonverbal communication through body language, or Kinesics, and the analysis of physical distance and space, or Proxemics, were observed to have a mean (M:2.87/Std:0.47), indicating that they were deemed as Sometimes Appropriate.
- The group's pragmatic criteria are evaluated as intermittently suitable, with a mean score of 4.00-2.08 and standard deviation of 0.00-0.62.
- The variable exhibiting the highest mean is "Foot/Leg-Hand/Arm movement" with a mean score of 4.00 and a standard deviation of 0.00, indicating that it is consistently deemed "Always Appropriate".
- The variable "Gestures" exhibits the lowest mean score of (M: 2.30/Std:0.48) and is evaluated as "Absent".

#### **4.4 The Impact of Age, Gender, Education, and Mean Length of Utterance on Pragmatic Development in Autistic Children**

Several independent variables, including age, gender, school attendance, and Mean Length of Utterance (MLU), have been associated with disparities in pragmatic development among autistic children. This section delves into the pragmatic development of children with respect to the four aforementioned variables.

##### **4.4.1 The Pragmatic Aspects Associated with Age**

The following table displays findings of different Pragmatic Aspects in relation to Age. For additional information, Autistic children are separated into two age-based groups, i.e., Less than ten group, and ten years and older group.

In the context of t-tests, a significance level of  $\leq (0.05)$  indicates that the observed statistical differences are considered significant. The presented tabular data indicates statistically significant variations at a significance level of ( $\alpha \leq 0.05$ ) among the pragmatic dimensions concerning age. In both cohorts, several pragmatic factors exhibit statistical significance at a level of  $\leq 0.05$ , in which (T) values are considered statistically significant. Consequently, the manifestation of variations in children's pragmatic aptitude with respect to their age is evidenced. The present findings indicate that age, when considered as an independent variable, exerts a discernible impact on the performance and conversational abilities of autistic children in relation to a select set of pragmatic parameters, specifically those pertaining to "Introduction," "Maintenance," and "Initiation."

- Introduction: The present study highlights the significance of the "Topic" Introduction parameter, as evidenced by a t-value of 0.048 or less ( $t \leq 0.048$ ). The observed variance goes in benefit of children whose age exceeds 10 years, with a mean score of 2.43 and a standard deviation of 0.53 (M: 2,43/Std:0.53), as assessed to be sometimes appropriate. However, the production aimed at children under the age of 10 was

evaluated as non-existent "Absent" and presented with a mean score of 1.83 and a standard deviation of 0.40 (M:1,83/Std:0.40).

- Maintenance: Upon evaluating the maintenance of the "Topic," it has been determined that this parameter holds significance, as indicated by the t-value of 0.042 or less ( $t \leq 0.042$ ). The observed variance in appropriateness ratings between children older than 10 years, with a mean of 2.71 and standard deviation of 0.75 (M: 2,71/Std:0.75), indicates a statistically significant difference in their favor. However, the production aimed at children under the age of 10 was evaluated as non-existent and exhibited a mean score of 2.00 with a standard deviation of 0.00 (M:2.00/Std:0.00).
- Initiation: Upon evaluating the "Turn Taking" initiation, it has been determined that this parameter holds significance with a t-value of 0.048 or less ( $t \leq 0.048$ ). The observed variance goes in benefit of children who have surpassed the age of 10 years, with a mean value of 2.71 and a standard deviation of 0.75 (M: 2,71/Std:0.75), as assessed to be Sometimes Appropriate. However, the production intended for an audience of children under the age of 10 was evaluated as non-existent and yielded a mean score of 2.00 with a standard deviation of 0.00 (M:2.00/Std:0.00).

During the assessment, however, the author of the study observed that varying degrees of pragmatic aspects were produced when comparing age groups. The aforementioned skills encompass:

- Repair/Revision phenomenon was found to be lacking in children below the age of 10 years, with a mean score of 2.16 and a standard deviation of 0.40 (M:2,16/ Std:0.40). However, in individuals with ASD aged over 10 years, repair/revision was observed to be sometimes appropriate, with a mean score of 2.43 and a standard deviation of 0.79 (M:2,43/Std: 0.79).

- Pause Time revealed its absence in children under the age of 10 (M: 2.00/ Std: 0.00), while in autistic individuals over the age of 10, it was occasionally deemed appropriate (M: 2.280/Std: 0.75).
- Physical Proximity was evaluated in two distinct age groups, namely children under 10 years and autistic individuals over 10 years. The results indicated that physical proximity was absent in the former group, with a mean score of 3.00 and standard deviation of 0.00 (M:3.00/ Std:0.00). In contrast, the latter group exhibited occasional appropriateness of physical proximity, with a mean score of 2.71 and standard deviation of 0.49 (M: 2.71/Std: 0.49).

**Table 16**

*Independent Samples T-Test Result Based on Age*

<b>Pragmatic Parameters</b>	<b>Age Groups</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>T</b>	<b>Sig.</b>
Speech Act Pair Analysis	Less than 10 years	3,0000	1,09545	-1,226	0,246
	10 years and over	3,5714	0,53452		
Variety of Speech Acts	Less than 10 years	2,5000	0,83666	-1,088	0,300
	10 years and over	3,0000	0,81650		
Selection	Less than 10 years	2,3333	0,81650	-2,183	0,052
	10 years and over	3,2857	0,75593		
Introduction	Less than 10 years	1,8333	0,40825	<b>-2,223</b>	<b>0,048</b>
	10 years and over	2,4286	0,53452		
Maintenance	Less than 10 years	2,0000	0,00000	<b>-2,300</b>	<b>0,042</b>
	10 years and over	2,7143	0,75593		
Change	Less than 10 years	3,6667	0,51640	-0,171	0,867
	10 years and over	3,7143	0,48795		
Initiation	Less than 10 years	2,0000	0,00000	<b>-2,300</b>	<b>0,042</b>

*A PRAGMATIC ANALYSIS OF AUTISTIC CHILDREN*

	10 years and over	2,7143	0,75593		
Response	Less than 10 years	3,5000	0,54772	0,238	0,817
	10 years and over	3,4286	0,53452		
Repair / Revision	Less than 10 years	2,1667	0,40825	-0,732	0,479
	10 years and over	2,4286	0,78680		
Pause Time	Less than 10 years	2,0000	0,00000	-0,920	0,377
	10 years and over	2,2857	0,75593		
Interruption/ Overlap	Less than 10 years	3,5000	0,54772	0,238	0,817
	10 years and over	3,4286	0,53452		
Feedback To Speakers	Less than 10 years	3,1667	0,40825	0,590	0,567
	10 years and over	3,0000	0,57735		
Adjacency	Less than 10 years	2,6667	0,51640	-0,171	0,867
	10 years and over	2,7143	0,48795		
Contingency	Less than 10 years	2,1667	0,40825	-1,512	0,159
	10 years and over	2,5714	0,53452		
Quantity/ Conciseness	Less than 10 years	1,8333	0,40825	-1,793	0,100
	10 years and over	2,2857	0,48795		
Specificity / Accuracy	Less than 10 years	2,3333	0,81650	-0,873	0,401
	10 years and over	2,7143	0,75593		
Cohesion	Less than 10 years	2,5000	0,83666	1,020	0,330
	10 years and over	2,1429	0,37796		
The Varying of Communicative Styles	Less than 10 years	2,6667	0,81650	0,214	0,835
	10 years and over	2,5714	0,78680		
Intelligibility	Less than 10 years	3,1667	0,75277	-0,344	0,738
	10 years and over	3,2857	0,48795		
Vocal Intensity	Less than 10 years	2,6667	0,51640	-1,088	0,300
	10 years and over	3,0000	0,57735		

Vocal Quality	Less than 10 years	3,3333	0,51640	1,387	0,193
	10 years and over	2,8571	0,69007		
Prosody	Less than 10 years	2,6667	0,81650	0,253	0,805
	10 years and over	2,5714	0,53452		
Fluency	Less than 10 years	2,3333	0,81650	0,130	0,899
	10 years and over	2,2857	0,48795		
Physical Proximity	Less than 10 years	3,0000	0,00000	1,425	0,182
	10 years and over	2,7143	0,48795		
Physical Contacts	Less than 10 years	2,6667	0,51640	-0,171	0,867
	10 years and over	2,7143	0,48795		
Body Posture	Less than 10 years	2,6667	0,51640	0,813	0,433
	10 years and over	2,4286	0,53452		
Foot/Leg and Hand/Arm Movements	Less than 10 years	4,0000	,00000a	-	-
	10 years and over	4,0000	,00000a		
Gestures	Less than 10 years	2,3333	0,51640	0,171	0,867
	10 years and over	2,2857	0,48795		
Facial Expression	Less than 10 years	2,6667	0,81650	-0,456	0,657
	10 years and over	2,8571	0,69007		
Eye Gaze	Less than 10 years	3,1667	0,75277	0,774	0,456
	10 years and over	2,8571	0,69007		

\* statistically significant value at level ( $\alpha \leq 0.05$ ).

a. t cannot be calculated because the standard deviations of the two groups are zero.

In conclusion, the current research reveals that age is an efficient determinant for defining variations in pragmatic communicative skill development among children with ASD.

The findings presented herein are in alignment with the research conducted by Eisenmajer and Prior (1991), wherein a positive association was observed between the performance on theory of mind tasks and verbal mental age (VMA). However, the findings of the present study are in opposition to those reported by Baron-Cohen (1992), who conducted an investigation involving four individuals with autism spectrum disorder across different age groups. In this research, participants successfully completed the false belief paradigm, with their cognitive aptitude being assessed through employment of age as an independent variable. He determined

that a somewhat advanced age was required, but insufficient, for autistic people to pass the Smarties test.

#### 4.4.2 The Pragmatic Aspects Associated with Gender

**Table 17**

*Independent Samples T-Test Result Based on Gender*

<b>Pragmatic Parameters</b>	<b>Age Groups</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>T</b>	<b>Sig.</b>
Speech Act Pair Analysis	Male	3,0375	0,74402	0,346	0,736
	Female	3,2000	1,09545		
Variety of Speech Acts	Male	2,7500	0,70711	-0,101	0,921
	Female	2,8000	1,09545		
Selection	Male	2,8750	0,99103	0,140	0,891
	Female	2,8000	0,83666		
Introduction	Male	2,0000	0,53452	-1,301	0,220
	Female	2,4000	0,54772		
Maintenance	Male	2,5000	0,75593	0,797	0,443
	Female	2,2000	0,44721		
Change	Male	3,6250	0,51755	-0,622	0,546
	Female	3,8000	0,44721		
Initiation	Male	2,5000	0,75593	0,797	0,443
	Female	2,2000	0,44721		
Response	Male	3,5000	0,53452	0,325	0,751
	Female	3,4000	0,54772		
Repair /Revision	Male	2,0000	0,00000	<b>-2,781</b>	<b>0,018</b>
	Female	2,8000	0,83666		
Pause Time	Male	2,0000	0,00000	-1,301	0,220

	Female	2,4000	0,89443		
Interruption/Overlap	Male	3,5000	0,53452	0,325	0,751
	Female	3,4000	0,54772		
Feedback to Speakers	Male	3,0000	0,53452	-0,695	0,501
	Female	3,2000	0,44721		
Adjacency	Male	2,6250	0,51755	-0,622	0,546
	Female	2,8000	0,44721		
Contingency	Male	2,5000	0,53452	1,043	0,319
	Female	2,2000	0,44721		
Quantity/Conciseness	Male	2,1250	0,64087	0,429	0,676
	Female	2,0000	0,00000		
Specificity /Accuracy	Male	2,5000	0,75593	-0,217	0,832
	Female	2,6000	0,89443		
Cohesion	Male	2,1250	0,35355	-1,369	0,198
	Female	2,6000	0,89443		
The Varying of Communicative Styles	Male	2,3750	0,51755	-1,500	0,162
	Female	3,0000	1,00000		
Intelligibility	Male	3,1250	0,64087	-0,793	0,445
	Female	3,4000	0,54772		
Vocal Intensity	Male	2,8750	0,64087	0,228	0,824
	Female	2,8000	0,44721		
Vocal Quality	Male	2,8750	0,64087	-1,513	0,158
	Female	3,4000	0,54772		
Prosody	Male	2,3750	0,51755	-1,847	0,092
	Female	3,0000	0,70711		
Fluency	Male	2,1250	0,35355	-1,369	0,198
	Female	2,6000	0,89443		
Physical Proximity	Male	2,7500	0,46291	-1,188	0,260
	Female	3,0000	0,00000		

Physical Contacts	Male	2,6250	0,51755	-0,622	0,546
	Female	2,8000	0,44721		
Body Posture	Male	2,3750	0,51755	-1,512	0,159
	Female	2,8000	0,44721		
Foot/Leg and Hand/Arm Movements	Male	4,0000	,00000a	-	-
	Female	4,0000	,00000a		
Gestures	Male	2,2500	0,46291	-0,531	0,606
	Female	2,4000	0,54772		
Facial Expression	Male	2,8750	0,83452	0,649	0,530
	Female	2,6000	0,54772		
Eye Gaze	Male	3,0000	0,75593	0,000	1,000
	Female	3,0000	0,70711		

\* statistically significant value at level ( $\alpha \leq 0.05$ ).

a. t cannot be calculated because the standard deviations of the two groups are zero.

In the realm of language acquisition, extant literature suggests that there exists a discernible distinction between the typical developmental stages of males and females with regard to their communicative abilities. In reference to children diagnosed with ASD, the aforementioned table indicates that the "t-value" exhibited statistical significance on two occasions with regards to prosody and fluency, favoring the male population. The statistical measure known as the "t-value" has been found to exhibit statistical significance in the context of the "Turn Taking" Repair/Revision parameter.

- Repair/Revision: the statistical analysis reveals that the "t-value" associated with the Repair/Revision parameter is statistically significant at a significance level of  $\alpha \leq 0.018$ . The mean value (M) of 2.80 and standard deviation (Std) of 0.83 (M:2.80/Std:0.83) indicate that females tend to exhibit a higher degree of proficiency in this parameter compared to males. In contrast, males tend to demonstrate an absence of fluency, with a mean value of 2.00 and a standard deviation of 0.00 (M:2.00/Std:0.00). The appropriateness of this parameter for males is evaluated as sometimes appropriate.

Throughout observation, the author of the study observed further disparities between autistic males and females regarding the production of pragmatic aspects. The following sets of abilities particularly highlighted these distinctions:

- The parameter of Speech Act Pair Analysis was found to be sometimes appropriate in females (M: 3.20/Std: 1.09), whereas it was found to be absent in males (M: 3.03/Std: 0.74).
- The parameter of speech acts diversity was found to be sometimes appropriate in females (M: 2.80/Std:1.09), while being absent in males (M: 2.75/Std:0.70).
- The parameter of Pause Time was found to be sometimes appropriate in females with a mean of 2.40 and standard deviation of 0.89 (M:2.40/Std:0.89), while it was found to be absent in males with a mean of 2.00 and standard deviation of 0.00 (M:2.00/Std:0.00).
- The parameter of cohesion was evaluated and found to be sometimes appropriate in females with a mean of 2.60 and standard deviation of 0.89 (M:2,60/Std:0.89), while it was found to be lacking in males with a mean of 2.12 and standard deviation of 0.35 (M: 2,12/Std:0.35).
- The parameter of varying of communicative styles was evaluated, revealing occasional appropriateness among females (M: 3.00/Std: 1.00), while males exhibited an absence of this trait (M: 2.37/Std: 0.51).
- The parameter of fluency was evaluated and found to be sometimes appropriate in females, with a mean score of 2.60 and a standard deviation of 0.89 (M:2.60/Std:0.89). In contrast, males exhibited an absence of fluency, with a mean score of 2.12 and a standard deviation of 0.35 (M:2,12/Std:0.35).
- The parameter of physical proximity was evaluated and found to be sometimes appropriate in females with a mean score of 3.00 and a standard deviation of 0.00

(M:3.00/Std:0.00). Conversely, it was found to be lacking in males with a mean score of 2.75 and a standard deviation of 0.46 (M:2.75/Std:0.46).

#### **4.4.3 The Pragmatic Aspects Associated with School Attendance**

Notably, in the accompanying table, school attendance indicates that the focus of the study is on autistic individuals who are enrolled in care centers as well as schools. In this regard, eight (08) individuals routinely attend schools and autism centres; specifically, four (04) children attend academic schools, while three (03) children regularly attend care centres, and one (01) child is enrolled in a private school. Utilizing the aforementioned variable, the tabular data presented herein evinces statistical significance ( $\alpha \leq 0.05$ ) of the "t-value" with respect for three (03) pragmatic factors as well as the researcher's observation of ten (10) subsequent aspects. This indicates that frequent school attendance is an effective determinant for predicting variations in the development of pragmatic communication skills among ASD children. These aspects are as follows:

- Variety of Speech Acts: This aspect is shown to be nonexistent in autistic children who do not attend school (M:2.33/Std:0.51), and sometimes appropriate in autistic children who attend school (M:3.14/Std:0.89);
- Introduction: This aspect is significant with a value of 2.22 ( $\alpha=0.048$ ), and the relevance is in favour of the children who attend school for whom Topic Introduction is rated as sometimes appropriate (M: 3.29/Standard Deviation: 0.49). While this characteristic is determined to be nonexistent in children who do not attend school (M:2.00/Std:0.00);
- Repair/Revision: This aspect is shown to be nonexistent in autistic children who do not attend school with (M:2,00/Std:0.00), whereas it is sometimes appropriate in autistic individuals who attend school (M=2.57, SD=0.78);

- Feedback to Speakers: This aspect is shown to be nonexistent in autistic children who do not attend school with (M:2,83/Std:0.40), whereas it is sometimes appropriate in autistic individuals who attend school (M:3.28/Std:0.48);
- Specificity/Accuracy: This aspect is shown to be nonexistent in autistic children who do not attend school with (M:2,16/Std:0.40), whereas it is sometimes appropriate in autistic individuals who attend school (M:2.85/Std:0.89);
- The Varying of Communicative Styles: This aspect is significant with a value of 2.26 ( $\alpha=0.26$ ), and the relevance is in favour of the children who attend school for whom Varying of Communicative Styles is rated as sometimes appropriate (M: 3.29/Standard Deviation: 0.49). while this characteristic is determined to be nonexistent in children who do not attend school (M:2.00/Std:0.00);
- Prosody: This aspect is significant with a value of 2.95 ( $\alpha=0.013$ ), and the relevance is in favour of the children who attend school for whom Prosody is rated as sometimes appropriate (M: 3.29/Standard Deviation: 0.49). while this characteristic is determined to be nonexistent in children who do not attend school (M:2.00/Std:0.00);
- Fluency: This aspect is shown to be nonexistent in autistic children who do not attend school with (M:2,00/Std:0.00), whereas it is sometimes appropriate in autistic individuals who attend school (M:2.57/Std:0.87);
- Physical Proximity: This aspect is shown to be nonexistent in autistic children who do not attend school with (M:2,71/Std:0.00), whereas it is sometimes appropriate in autistic individuals who attend school (M:3.00/Std:0.48);
- Eye Gaze: This aspect is shown to be nonexistent in autistic children who do not attend school with (M:2,71/Std:0.51), whereas it is sometimes appropriate in autistic individuals who attend school (M:3.33/Std:0.75).

**Table 18**

*Independent Samples T-Test Result Based on School Attendance*

<b>Pragmatic Parameters</b>	<b>Age Groups</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>T</b>	<b>Sig.</b>
Speech Act Pair Analysis	Yes	3,4286	0,78680	0,534	0,604
	No	3,1667	0,98319		
Variety of Speech Acts	Yes	3,1429	0,89974	<b>1,940</b>	<b>0,078</b>
	No	2,3333	0,51640		
Selection	Yes	3,0000	0,81650	0,650	0,529
	No	2,6667	1,03280		
Introduction	Yes	2,4286	0,53452	<b>2,223</b>	<b>0,048</b>
	No	1,8333	0,40825		
Maintenance	Yes	2,5714	0,78680	1,132	0,282
	No	2,1667	0,40825		
Change	Yes	3,7143	0,48795	0,171	0,867
	No	3,6667	0,51640		
Initiation	Yes	2,4286	0,53452	0,253	0,805
	No	2,3333	0,81650		
Response	Yes	3,4286	0,53452	-0,238	0,817
	No	3,5000	0,54772		
Repair / Revision	Yes	2,5714	0,78680	<b>1,768</b>	<b>0,105</b>
	No	2,0000	0,00000		
Pause Time	Yes	2,2857	0,75593	0,920	0,377
	No	2,0000	0,00000		
Interruption/ Overlap	Yes	3,2857	0,48795	-1,367	0,199
	No	3,6667	0,51640		

*A PRAGMATIC ANALYSIS OF AUTISTIC CHILDREN*

Feedback to Speakers	Yes	3,2857	0,48795	<b>1,793</b>	<b>0,100</b>
	No	2,8333	0,40825		
Adjacency	Yes	2,7143	0,48795	0,171	0,867
	No	2,6667	0,51640		
Contingency	Yes	2,4286	0,53452	0,325	0,751
	No	2,3333	0,51640		
Quantity/ Conciseness	Yes	2,1429	0,37796	0,504	0,624
	No	2,0000	0,63246		
Specificity / Accuracy	Yes	2,8571	0,89974	<b>1,726</b>	<b>0,112</b>
	No	2,1667	0,40825		
Cohesion	Yes	2,4286	0,78680	0,732	0,479
	No	2,1667	0,40825		
The Varying of Communicative Styles	Yes	3,0000	0,81650	<b>2,260</b>	<b>0,045</b>
	No	2,1667	0,40825		
Intelligibility	Yes	3,4286	0,53452	1,326	0,212
	No	3,0000	0,63246		
Vocal Intensity	Yes	3,0000	0,57735	1,088	0,300
	No	2,6667	0,51640		
Vocal Quality	Yes	2,8571	0,69007	-1,387	0,193
	No	3,3333	0,51640		
Prosody	Yes	3,0000	0,57735	<b>2,951</b>	<b>0,013</b>
	No	2,1667	0,40825		
Fluency	Yes	2,5714	0,78680	<b>1,768</b>	<b>0,105</b>
	No	2,0000	0,00000		
Physical Proximity	Yes	3,0000	0,48795	<b>1,425</b>	<b>0,108</b>
	No	2,7143	0,00000		
Physical Contacts	Yes	2,7143	0,48795	0,171	0,867
	No	2,6667	0,51640		
Body Posture	Yes	2,4286	0,53452	-0,813	0,433
	No	2,6667	0,51640		

Foot/leg and hand/arm movements	Yes	4,0000	,00000a	-	-
	No	4,0000	,00000a		
Gestures	Yes	2,1429	0,37796	-1,387	0,193
	No	2,5000	0,54772		
Facial expression	Yes	2,7143	0,75593	-0,284	0,782
	No	2,8333	0,75277		
Eye gaze	Yes	3.3333	0,75593	<b>1,691</b>	<b>0,119</b>
	No	2,7143	0,51640		

\* statistically significant value at level ( $\alpha \leq 0.12$ ).

a. t cannot be calculated because the standard deviations of the two groups are zero.

In terms of developing pragmatic skills, the research found a significant disparity between autistic children who do attend schools and centres and those who do not. As compared to the autistic participants who do not attend schools, those attending schools performed very well on the bulk of parameters. Thus, schooling is an efficient indicator of pragmatic disparities in autistic children.

The assertion made by Williams et al. (2005) posits that attendance in educational institutions specifically designed for autistic children is of paramount importance and holds significant utility. According to him, one of the fundamental justifications for putting autistic children in mainstream classrooms is to increase their interaction with average classmates. Moreover, according to Barnard-Brak et al. (2014), Furthermore, as posited by Barnard-Brak et al. (2014), individuals with ASD may benefit from targeted intervention techniques implemented by professionals, educators, peers, and other adults to enhance their social interaction abilities. Furthermore, these results concur with those of Robertson et al. (2003), who contend that autistic children are more socially active with their classmates when they are put in conventional schools. Other researchers argued that classrooms and day care centres are environments where youngsters may develop pragmatic as well as social abilities (Matson et al., 2009).

**4.4.4 The Pragmatic Aspects Associated with Mean Length of Utterance (MLU)**

The following table displays findings of different Pragmatic Aspects in relation to MLU. For additional information, Autistic children are separated into five MLU-based groups, i.e., from 1.5 to 2.5, from 2.5 to 3.5, from 3.5 to 4.5, from 4.5 to 5.5, and from 5.5 to 6.5.

When conducting an F-test, if the significance value is less than or equal to 0.05 ( $\leq 0.05$ ), it indicates that the observed statistical differences are considered significant. The present tabular representation indicates that there exist statistically noteworthy variations at the significance level ( $\alpha \leq 0.05$ ) concerning the pragmatic components in association with MLU. Across all groups, several pragmatic factors exhibit statistical significance at or below the threshold of  $\leq 0.05$ , as determined by statistically significant (F) values. Consequently, disparities in children's pragmatic ability with respect to Mean Length of Utterance (MLU) are evidenced. It means that MLU, when utilized as an independent variable, exerts a significant impact on the performance and conversational abilities of children with ASD across a majority of pragmatic parameters. The present study evinces a discernible contrast in favor of the final cohort, wherein the mean length of utterance (MLU) exhibits the most elevated values.

**Table 19**

*Independent Samples T-Test Result Based on Mean Length of Utterance*

<b>Pragmatic parameters</b>	<b>MLU</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>F</b>	<b>Sig.</b>
Speech act pair analysis	1.5-2.5	3,0000	1,15470	1,288	0,351
	2.5-3.5	3,6667	0,57735	0,272	0,888
	3.5-4.5	3,3333	0,57735	0,487	0,746
	<b>4.5-5.5</b>	<b>4,0000</b>	<b>0,00000</b>	<b>8,114</b>	<b>0,006</b>
	<b>5.5-6.5</b>	<b>2,0000</b>	<b>-</b>	<b>10,462</b>	<b>0,003</b>
Variety of Speech Act	1.5-2.5	2,0000	0,00000	0,144	0,961
	2.5-3.5	2,0000	-	1,206	0,379
	3.5-4.5	4,0000	0,00000	0,982	0,469
	4.5-5.5	2,6667	0,57735	1,179	0,389
	5.5-6.5	3,3333	0,57735	0,462	0,763
Selection	1.5-2.5	2,2500	0,50000	1,102	0,419
	2.5-3.5	2,0000	-	1,189	0,385
	3.5-4.5	3,5000	0,70711	2,747	0,104
	4.5-5.5	4,0000	0,00000	3,275	0,072

A PRAGMATIC ANALYSIS OF AUTISTIC CHILDREN

	5.5-6.5	2,3333	0,57735	0,192	0,936
	1.5-2.5	2,2500	0,50000	1,773	0,227
	2.5-3.5	2,0000	0,00000	0,651	0,642
Introduction	3.5-4.5	2,0000	1,00000	0,161	0,952
	<b>4.5-5.5</b>	<b>2,5000</b>	<b>0,70711</b>	<b>4,794</b>	<b>0,029</b>
	<b>5.5-6.5</b>	<b>2,0000</b>	<b>-</b>	<b>17,077</b>	<b>0,001</b>
	1.5-2.5	2,2500	0,50000	2,726	0,106
	2.5-3.5	2,6667	1,15470	0,144	0,961
Maintenance	3.5-4.5	2,0000	0,00000	0,792	0,562
	4.5-5.5	2,6667	0,57735	3,077	0,082
	<b>5.5-6.5</b>	<b>2,0000</b>	<b>-</b>	<b>4,769</b>	<b>0,029</b>
	1.5-2.5	3,7500	0,50000	3,538	0,060
	2.5-3.5	4,0000	-		
Change	3.5-4.5	3,5000	0,70711	0,890	0,512
	4.5-5.5	3,6667	0,57735	0,442	0,776
	5.5-6.5	3,6667	0,57735	0,880	0,517
	1.5-2.5	2,0000	0,00000	1,288	0,351
	2.5-3.5	3,0000	1,00000	0,272	0,888
Initiation	3.5-4.5	2,3333	0,57735	0,487	0,746
	<b>4.5-5.5</b>	<b>2,5000</b>	<b>0,70711</b>	<b>8,114</b>	<b>0,006</b>
	<b>5.5-6.5</b>	<b>2,0000</b>	<b>-</b>	<b>10,462</b>	<b>0,003</b>
	1.5-2.5	3,5000	0,57735	0,144	0,961
	2.5-3.5	4,0000	-	1,206	0,379
Response	3.5-4.5	3,5000	0,70711	0,982	0,469
	4.5-5.5	3,0000	0,00000	1,179	0,389
	5.5-6.5	3,6667	0,57735	0,462	0,763
	1.5-2.5	2,5000	0,57735	1,102	0,419
	2.5-3.5	2,0000	-	1,189	0,385
Repair/Revision	3.5-4.5	3,0000	1,41421	2,747	0,104
	4.5-5.5	2,0000	0,00000	3,275	0,072
	5.5-6.5	2,0000	0,00000	0,192	0,936
	1.5-2.5	2,5000	1,00000	1,773	0,227
	2.5-3.5	2,0000	0,00000	0,161	0,952
Pause Time	3.5-4.5	2,0000	0,00000	4,794	0,029
	4.5-5.5	2,0000	0,00000	0,651	0,642
	<b>5.5-6.5</b>	<b>2,0000</b>	<b>-</b>	<b>17,077</b>	<b>0,001</b>
	1.5-2.5	3,7500	0,50000	2,726	0,106
	2.5-3.5	3,6667	0,57735	0,144	0,961
Interruption/Overlap	3.5-4.5	3,0000	0,00000	0,792	0,562
	4.5-5.5	3,3333	0,57735	3,077	0,082
	<b>5.5-6.5</b>	<b>3,0000</b>	<b>-</b>	<b>4,769</b>	<b>0,029</b>
	1.5-2.5	3,0000	0,00000	3,538	0,060
	2.5-3.5	3,0000	-		
Feedback to Speakers	3.5-4.5	3,5000	0,70711	0,890	0,512
	4.5-5.5	2,6667	0,57735	0,442	0,776
	5.5-6.5	3,3333	0,57735	0,880	0,517
	1.5-2.5	3,0000	0,00000	1,288	0,351
Adjacency	2.5-3.5	2,3333	0,57735	0,272	0,888
	3.5-4.5	3,0000	0,00000	0,487	0,746
	<b>4.5-5.5</b>	<b>2,5000</b>	<b>0,70711</b>	<b>8,114</b>	<b>0,006</b>

	<b>5.5-6.5</b>	<b>2,0000</b>	-	<b>10,462</b>	<b>0,003</b>
	1.5-2.5	2,0000	0,00000	0,144	0,961
	2.5-3.5	2,0000	-	1,206	0,379
Contingency	3.5-4.5	2,5000	0,70711	0,982	0,469
	4.5-5.5	3,0000	0,00000	1,179	0,389
	5.5-6.5	2,3333	0,57735	0,462	0,763
	1.5-2.5	2,0000	0,00000	1,102	0,419
	2.5-3.5	2,0000	-	1,189	0,385
Quantity/Conciseness	3.5-4.5	2,0000	0,00000	2,747	0,104
	4.5-5.5	2,3333	0,57735	3,275	0,072
	5.5-6.5	2,0000	1,00000	0,192	0,936
	1.5-2.5	2,0000	0,00000	1,773	0,227
	2.5-3.5	2,6667	0,57735	0,651	0,642
Specificity	3.5-4.5	2,6667	1,15470	0,161	0,952
	<b>4.5-5.5</b>	<b>3,5000</b>	<b>0,70711</b>	<b>4,794</b>	<b>0,029</b>
	<b>5.5-6.5</b>	<b>2,0000</b>	-	<b>17,077</b>	<b>0,001</b>
	1.5-2.5	2,0000	0,00000	2,726	0,106
	2.5-3.5	2,0000	0,00000	0,144	0,961
Cohesion	3.5-4.5	3,5000	0,70711	0,792	0,562
	4.5-5.5	2,0000	0,00000	3,077	0,082
	<b>5.5-6.5</b>	<b>3,0000</b>	-	<b>4,769</b>	<b>0,029</b>
	1.5-2.5	2,2500	0,50000	3,538	0,060
	2.5-3.5	3,0000	-		
Lexical Selection/Use across Speech Acts	3.5-4.5	4,0000	0,00000	0,890	0,512
	4.5-5.5	2,3333	0,57735	0,442	0,776
	5.5-6.5	2,3333	0,57735	0,880	0,517
	1.5-2.5	3,2500	0,50000	1,288	0,351
	2.5-3.5	3,0000	0,00000	0,272	0,888
Stylistic Variations	3.5-4.5	3,0000	1,00000	0,487	0,746
	<b>4.5-5.5</b>	<b>3,5000</b>	<b>0,70711</b>	<b>8,114</b>	<b>0,006</b>
	<b>5.5-6.5</b>	<b>4,0000</b>	-	<b>10,462</b>	<b>0,003</b>
	1.5-2.5	2,7500	0,50000	0,144	0,961
	2.5-3.5	3,0000	-	1,206	0,379
Intelligibility	3.5-4.5	3,0000	0,00000	0,982	0,469
	4.5-5.5	2,6667	0,57735	1,179	0,389
	5.5-6.5	3,0000	1,00000	0,462	0,763
	1.5-2.5	3,7500	0,50000	1,102	0,419
	2.5-3.5	3,0000	-	1,189	0,385
Vocal Intensity	3.5-4.5	3,0000	0,00000	2,747	0,104
	4.5-5.5	2,6667	0,57735	3,275	0,072
	5.5-6.5	2,6667	0,57735	0,192	0,936
	1.5-2.5	2,5000	0,57735	1,773	0,227
	2.5-3.5	2,0000	0,00000	0,651	0,642
Vocal Quality	3.5-4.5	3,0000	0,00000	0,161	0,952
	<b>4.5-5.5</b>	<b>3,5000</b>	<b>0,70711</b>	<b>4,794</b>	<b>0,029</b>
	<b>5.5-6.5</b>	<b>2,0000</b>	-	<b>17,077</b>	<b>0,001</b>
	1.5-2.5	2,2500	0,50000	2,726	0,106
	2.5-3.5	2,3333	0,57735	0,144	0,961
Prosody	3.5-4.5	3,0000	1,41421	0,792	0,562
	4.5-5.5	2,0000	0,00000	3,077	0,082

	<b>5.5-6.5</b>	<b>2,0000</b>	-	<b>4,769</b>	<b>0,029</b>
	1.5-2.5	3,0000	0,00000	3,538	0,060
	2.5-3.5	3,0000	-		
Fluency	3.5-4.5	3,0000	0,00000	0,890	0,512
	4.5-5.5	3,0000	0,00000	0,442	0,776
	5.5-6.5	2,3333	0,57735	0,880	0,517
	1.5-2.5	2,7500	0,50000	1,288	0,351
Physical Proximity	2.5-3.5	2,6667	0,57735	0,272	0,888
	3.5-4.5	2,6667	0,57735	0,487	0,746
	<b>4.5-5.5</b>	<b>2,5000</b>	<b>0,70711</b>	<b>8,114</b>	<b>0,006</b>
	<b>5.5-6.5</b>	<b>3,0000</b>	-	<b>10,462</b>	<b>0,003</b>
	1.5-2.5	3,0000	0,00000	0,144	0,961
Physical Contacts	2.5-3.5	3,0000	-	1,206	0,379
	3.5-4.5	2,5000	0,70711	0,982	0,469
	4.5-5.5	2,3333	0,57735	1,179	0,389
	5.5-6.5	2,0000	0,00000	0,462	0,763
	1.5-2.5	4,0000	0,00000	1,102	0,419
Body Posture	2.5-3.5	4,0000	-	1,189	0,385
	3.5-4.5	4,0000	0,00000	2,747	0,104
	4.5-5.5	4,0000	0,00000	3,275	0,072
	5.5-6.5	4,0000	0,00000	0,192	0,936
	1.5-2.5	2,2500	0,50000	1,773	0,227
Foot/leg and hand/arm movements	2.5-3.5	2,3333	0,57735	0,651	0,642
	3.5-4.5	2,0000	0,00000	0,161	0,952
	<b>4.5-5.5</b>	<b>2,5000</b>	<b>0,70711</b>	<b>4,794</b>	<b>0,029</b>
	<b>5.5-6.5</b>	<b>3,0000</b>	-	<b>17,077</b>	<b>0,001</b>
	1.5-2.5	3,0000	0,81650	2,726	0,106
	2.5-3.5	3,0000	1,00000	0,144	0,961
Gestures	3.5-4.5	2,5000	0,70711	0,792	0,562
	4.5-5.5	2,3333	0,57735	3,077	0,082
	<b>5.5-6.5</b>	<b>3,0000</b>	-	<b>4,769</b>	<b>0,029</b>
	1.5-2.5	3,5000	0,57735	3,538	0,060
Facial Expressions	2.5-3.5	3,0000	-		
	3.5-4.5	2,5000	0,70711	0,890	0,512
	4.5-5.5	2,6667	0,57735	0,442	0,776
	5.5-6.5	3,0000	1,00000	0,880	0,517
	1.5-2.5	3,0000	1,15470	1,288	0,351
Eye Gaze	2.5-3.5	3,6667	0,57735	0,272	0,888
	3.5-4.5	3,3333	0,57735	0,487	0,746
	<b>4.5-5.5</b>	<b>4,0000</b>	<b>0,00000</b>	<b>8,114</b>	<b>0,006</b>
	<b>5.5-6.5</b>	<b>2,0000</b>	-	<b>10,462</b>	<b>0,003</b>

\* statistically significant value at level ( $\alpha \leq 0.05$ ).

a. t cannot be calculated because the standard deviations of the two groups are zero.

The pragmatic parameters are as follows:

- Speech Act Pair Analysis: The analysis of speech act pairs holds significant importance with a statistical value of 10.46 ( $\alpha = 0.003$ ). The results indicate that the fifth group has

a higher relevance, as evidenced by their mean and standard deviation of MLU (M: 2.00/Standard Deviation: 0.00). Regarding the remaining four groups, the Mean and Standard Deviation values fall within the range of (M: 3.00-4.00/Std: 0.00-1.15);

- Introduction: The introduction holds considerable importance with a statistically significant value of 17.07 ( $\alpha=0.001$ ). The relevance of this aspect is in favor of the fifth group, for whom the mean and standard deviation of MLU are (M: 2.00/Standard Deviation: 0.00). Regarding the remaining four groups, the Mean and Standard Deviation values fall within the range of (M: 2.00-2.50 / Std: 0.00-1.00);
- Maintenance: This aspect is significant with a value of 4.76 ( $\alpha=0.029$ ), and the relevance is in favour of the fifth group for whom Mean and Standard Deviation of MLU are (M: 2.00/Standard Deviation: 0.00). As for the other four groups, Mean and Standard Deviation are ranged between (M:2.00-2.66/Std:0.00-1.15);
- Initiation: This aspect is significant with a value of 10.46 ( $\alpha=0.003$ ), and the relevance is in favour of the fifth group for whom Mean and Standard Deviation of MLU are (M: 2.00/Standard Deviation: 0.00). As for the other four groups, Mean and Standard Deviation are ranged between (M:2.00-2.50/Std:0.00-1.00);
- Pause Time: This aspect is significant with a value of 17.07 ( $\alpha=0.001$ ), and the relevance is in favour of the fifth group for whom Mean and Standard Deviation of MLU are (M: 2.00/Standard Deviation: 0.00). As for the other four groups, Mean and Standard Deviation are ranged between (M:2.00-2.50/Std:0.00-1.00);
- Interruption/Overlap: This aspect is significant with a value of 4.76 ( $\alpha=0.029$ ), and the relevance is in favour of the fifth group for whom Mean and Standard Deviation of MLU are (M: 3.00/Standard Deviation: 0.00). As for the other four groups, Mean and Standard Deviation are ranged between (M:3.00-3.75/Std:0.00-0.57);

- **Adjacency:** This aspect bears statistical significance at a significance level of a value of 10.46 ( $\alpha=0.003$ ), and the relevance is in favour of the fifth group for whom Mean and Standard Deviation of MLU are (M: 2.00/Standard Deviation: 0.00). As for the other four groups, Mean and Standard Deviation are ranged between (M:2.33-3.00/Std:0.00-0.70);
- **Specificity:** This aspect bears statistical significance at a significance level of a value of 17.07 ( $\alpha=0.001$ ), and the relevance is in favour of the fifth group for whom Mean and Standard Deviation of MLU are (M: 2.00/Standard Deviation: 0.00). As for the other four groups, Mean and Standard Deviation are ranged between (M:2.00-3.50/Std:0.00-1.15);
- **Cohesion:** This aspect is significant with a value of 4.76 ( $\alpha=0.029$ ), and the relevance is in favour of the fifth group for whom Mean and Standard Deviation of MLU are (M: 3.00/Standard Deviation: 0.00). As for the other four groups, Mean and Standard Deviation are ranged between (M:2.00-3.50/Std:0.00-0.70);
- **Stylistic Variation:** This aspect bears statistical significance at a significance level of a value of 10.46 ( $\alpha=0.003$ ), and the relevance is in favour of the fifth group for whom Mean and Standard Deviation of MLU are (M: 4.00/Standard Deviation: 0.00). As for the other four groups, Mean and Standard Deviation are ranged between (M:3.00-3.50/Std:0.00-1.00);
- **Vocal Quality:** This aspect is significant with a value of 17.07 ( $\alpha=0.001$ ), and the relevance is in favour of the fifth group for whom Mean and Standard Deviation of MLU are (M: 2.00/Standard Deviation: 0.00). As for the other four groups, Mean and Standard Deviation are ranged between (M:2.00-3.50/Std:0.00-0.70);
- **Prosody:** This aspect bears statistical significance at a significance level of a value of 4.76 ( $\alpha=0.029$ ), and the relevance is in favour of the fifth group for whom Mean and

Standard Deviation of MLU are (M: 2.00/Standard Deviation: 0.00). As for the other four groups, Mean and Standard Deviation are ranged between (M:2.00-3.00/Std:0.00-1.41);

- Physical Proximity: This aspect is significant with a value of 10.46 ( $\alpha=0.003$ ), and the relevance is in favour of the fifth group for whom Mean and Standard Deviation of MLU are (M: 3.00/Standard Deviation: 0.00). As for the other four groups, Mean and Standard Deviation are ranged between (M:2.50-2.75/Std:0.50-0.70);
- Foot/Leg and Hand/Arm Movement: This aspect is significant with a value of 17.07 ( $\alpha=0.001$ ), and the relevance is in favour of the fifth group for whom Mean and Standard Deviation of MLU are (M: 3.00/Standard Deviation: 0.00). As for the other four groups, Mean and Standard Deviation are ranged between (M:2.00-2.50/Std:0.00-0.70);
- Gestures: The aspect holds considerable significance, as evidenced by a statistically significant value of 4.76 ( $\alpha=0.029$ ). Furthermore, the relevance of this aspect is in favor of the fifth group, as indicated by their Mean and Standard Deviation of MLU, which are 3.00 and 0.00 (M: 3.00/Standard Deviation: 0.00), respectively. Regarding the remaining four groups, the mean and standard deviation values fall within the range of M: 2.33-3.00 and Std: 0.57-1.00 (M:2.33-3.00/Std:0.57-1.00);
- Eye Gaze: The present aspect holds considerable significance with a statistical value of 10.64 ( $\alpha=0.003$ ). The findings indicate that the fifth group exhibits a higher degree of relevance, as evidenced by their Mean and Standard Deviation of MLU, which are recorded as M: 2.00 and Standard Deviation: 0.00 (M: 2.00/Standard Deviation: 0.00), respectively. Regarding the remaining four groups, the Mean and Standard Deviation values fall within the range of (M: 3.00-4.00 / Std: 0.00-1.15).

Measures of language development, specifically Mean Length of Utterance have been frequently used (Miller, 1981). The building block of words is called a "morpheme." A child's

speech patterns become more complex and longer as he develops and acquires new knowledge. As expected, average children's ages exert a notable influence on the development of morpheme sequences and language acquisition. The child's MLU improves and grows according to the child's pace of development. Conversely, the linguistic development of children with autism appears to be distinct. Autism is a delay, and delays in development inhibit typical MLU maturation. The researcher used MLU as an independent variable in this study since it is well recognised as a reliable indicator of individual variations in children.

In terms of the research itself, children with ASD were split up into five categories based on their MLU scores. Accordingly, the results show that the fifth group, with the greatest Mean Length of Utterance (MLU), benefits from most of the performance disparities. The results support the notion that MLU is useful for distinguishing between children with ASD with regard to their pragmatic ability. These findings corroborate those of Rice et al (2010). The authors conclude that MLU is a valid as well as reliable measure of both typical language development and language impairment. In addition, Eisenberg et al. (2001) consider MLU to be a helpful measure in studies of youngsters with language disorders. They claim that MLU is utilised in clinical contexts for the purpose of identifying children with language deficits, with a deficit of one "Standard Deviation" or more below the "Mean" for the participant's age being employed as a diagnostic threshold. In addition, Tager-Flusberg et al. (2009) suggested using MLU as an indicator to compare the results of different studies including language-based interventions for children diagnosed with autism spectrum disorder.

#### **4.5 Performance of Children on Pragmatic Aspects and Corresponding MLU**

The Pearson Correlation Test is used to determine the relationship between MLU and the other independent variables in order to demonstrate the degree to which MLU is connected with age, gender, and school attendance. The following table shows the results obtained from this test:

**Table 20**

*The Pearson Correlation Coefficient between the Performance of Participants on Pragmatic Parameters and Age, Gender, School Attendance, and MLU*

		MLU	Pragmatic Parameters
<b>MLU</b>	Pearson Correlation		<b>0,750**</b>
	Sig. (2-tailed)		<b>0,0087</b>
	Number		<b>13</b>
<b>Age</b>	Pearson Correlation	0,539	0,389
	Sig. (2-tailed)	0,058	0,189
	Number	13	13
<b>Attending Schools</b>	Pearson Correlation	<b>0,635**</b>	<b>0,386**</b>
	Sig. (2-tailed)	<b>0,0020</b>	<b>0,0193</b>
	Number	<b>13</b>	<b>13</b>
<b>Gender</b>	Pearson Correlation	-0,141	<b>0,496**</b>
	Sig. (2-tailed)	0,646	<b>0,0095</b>
	Number	13	<b>13</b>

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The above table demonstrates that:

➤ **Pragmatic Aspects and MLU**

The correlation coefficient demonstrates a positive association between pragmatic aspects and MLU: ( $r=0.750^{**}$ , sig. 2 tailed= 0.0087). This suggests that when children's MLU develops, their total performance on pragmatic aspects also improves.

➤ **Pragmatic Aspects and Age**

The value of the correlation coefficient demonstrates that there is no association between pragmatic aspects and age: ( $r=0.39$ , sig. 2 tailed=0.189). This suggests that when the age of a person with ASD advances, performance on pragmatic factors is unaffected.

➤ **Pragmatic Aspects and School Attendance**

The correlation coefficient value demonstrates a high positive association between pragmatic characteristics and education: ( $r=0.386^{**}$ , sig. 2 tailed=0.0193). This suggests that a child's performance on pragmatic aspects is significantly affected by their attendance at schools and care facilities.

➤ **Pragmatic Aspects and Gender**

The correlation coefficient value demonstrates a positive association between pragmatic characteristics and gender: ( $r=0.496^{**}$ , sig. 2 tailed= $0.0095$ ). This suggests that a child's performance on pragmatic aspects is significantly affected by their gender.

➤ **MLU and Age**

The correlation coefficient result indicates that there is no association between MLU and age: ( $r=0.539$ , sig.2 tailed= $0.058$ ). This demonstrates that the ageing of children with ASD has no effect on MLU development.

➤ **MLU and School Attendance**

The correlation coefficient demonstrates a considerable relationship between school attendance and MLU: ( $r=0.635^{**}$ , sig. 2 tailed= $0.002$ ). This suggests that attending school or care centres has a significant impact on the development of MLU in children with ASD.

➤ **MLU and Gender**

The correlation coefficient result demonstrates that there is no association between MLU and gender: ( $r=-0.141$ , sig. 2 tailed =  $0.646$ ). This suggests that the variations between boys and girls with ASD have no effect on MLU development.

In conclusion, the preceding findings indicate that an improvement in the child's MLU is substantially connected with the likelihood to attend school. This validates the hypothesis stated by the researcher that continuous school attendance affords autistic children the chance to develop and enhance the pragmatic and social abilities. This is done because Children will participate in several sorts of dialogues (adult-child and peer-to-peer conversations). In consequence, MLU will be enhanced and expanded. In addition, autistic children improve their pragmatic competence by increasing MLU.

### **General Conclusion**

Language development of an autistic child is hampered by a lack of proper social engagement and, as a result, social interpretation due to their neurologically decreased social aptitude. This has an impact on the key language domains of discourse, pragmatic functions, and grammar to varied degrees. As a result, autistic people frequently have a limited vocabulary and syntax, unusual tone or pitch in their speech, and little or no understanding of how to converse. Autistic people's language development is frequently delayed and hampered as a result of their neurological illness. A child's lack of age-appropriate verbal development could indicate that he or she has autism. Some severely autistic children never learn to communicate. The investigation of pragmatics as a constituent of the development of language holds significant importance in the fields of psycholinguistics and neurolinguistics, particularly in the identification of communicative impairments in autistic children. The present study has examined the broad domain of communicative skills, with a specific focus on pragmatic skills.

The primary aims of this study are to investigate the communicative skills of children with autism spectrum disorder in Algeria, with a particular focus on their pragmatic competence. Additionally, this research seeks to examine the impact of independent variables such as age, gender, school attendance, and Mean Length of Utterance (MLU) on the development of pragmatic skills in this population. Ultimately, this study aims to develop a comprehensive theory regarding the universality of pragmatic development in children with ASD and the relationship between grammatical competence and pragmatic skills. The primary objective of this study is to investigate the phenomenon of pragmatics within the context of Algerian autism and examine the key factors that are undeniably pertinent to its deficits and advancements. This study provides insights into the impact of school attendance on the acquisition of communicative abilities and pragmatic proficiency.

To achieve the aforementioned objectives, a carefully constructed methodology has

been employed. The present study has utilized three distinct methods of inquiry, specifically the pragmatic protocol, video recordings, and participant observation, to procure the necessary data for the research. The present study selected a sample population from the Wilaya of Batna to serve as a case study for the purpose of categorizing the Algerian autistic speech communities in their entirety. Thus, the subsequent inquiries for investigation have been posited:

- Do children diagnosed with ASD exhibit proficient or deficient pragmatic communicative skills?
- How does a child's age, gender, mean length of utterance (MLU), as well as access to schooling have an impact on their pragmatic growth?
- Is there a measurable degree to which MLU relate positively with school attendance among Algerian Autistic children?

This study presents a comprehensive overview of four chapters, with the first chapter commencing with a literature review that provides an in-depth understanding of autism spectrum disorder and its underlying theories. These theories serve as a foundation for analyzing the data. Chapter two provides an overview of the pragmatic field and explores the correlation between deficits in pragmatics and autism. Chapter three specifies the research design by describing the focus of this research. It highlights a comprehensive approach to the study as well as representing process of gathering and analyzing data. Lastly, the fourth chapter assesses the development of different pragmatic communicative skills with regard to the autistic participants. It also presents the discussion of these findings.

The present study endeavors to examine pragmatic impairments manifested in the communicative behaviors of Algerian children diagnosed with autism spectrum disorder, through a comprehensive analysis of four distinct chapters. Initially, the phenomenon of autism spectrum disorder is examined in relation to language development in a comprehensive manner.

The present study examines the potential correlation between autism and pragmatic development, with a focus on the extent to which autism could hinder or facilitate the utilization of various pragmatic features. Thirdly, an investigation into the differential impact of independent variables, namely age, gender, school attendance, and mean length of utterance (MLU), on the development of pragmatic communicative abilities.

On account of the retrieved results and regarding each hypothesis aside, the following conclusions have been drawn:

- Initially, our hypothesis posits that children with ASD exhibit pragmatic impairments. Subsequently, our study of Algerian participants with ASD revealed suboptimal, inefficient, communicative behaviors. Similar results were obtained in the investigation conducted by Prutting and Kirshner (1987) when evaluating the pragmatic abilities of a cohort of children with disorders. Based on the findings, it can be inferred that the pragmatic deficit observed in children with autism is not necessarily tied to a particular language, despite the presence of certain disparities in the acquisition of culturally conventionalized abilities that are known to be influenced by social and cultural factors. Hence, the manifestation of pragmatic impairments in individuals with autism spectrum disorder can be attributed to cognitive mechanisms rather than cultural factors.
- With respect to the second hypothesis posited, namely that the development of pragmatics in children diagnosed with autism spectrum disorders may be subject to the influence of certain extraneous variables, including age, gender, school attendance, and Mean Length of Utterance (MLU). Henceforth, upon studying the impact of aforementioned variables, it has been ascertained that in children diagnosed with ASD, the proficiencies pertaining to diverse pragmatic skills exhibit improvement with the official schooling and the augmentation of Mean Length of Utterance (MLU). Empirical evidence suggests that autistic children who regularly attend care centers and

schools exhibit superior performance compared to their counterparts who do not attend such institutions. Broadly speaking, the empirical investigation has demonstrated a significant disparity in the development of pragmatic abilities between children who receive formal education in schools or centers and those who lack such exposure. The results indicate that individuals with greater degrees of education exhibited superior performance across a majority of the assessed parameters when compared to their counterparts with autism who had lower levels of education. Hence, education emerges as a significant variable for determining pragmatic distinctions among children diagnosed with autism spectrum disorder. The present study's results align with the findings of Barnard-Brak et al (2014), which suggest that targeted intervention strategies employed by teachers, professionals, teachers, peers, and other adult individuals can effectively enhance the social engagement of individuals with autism. Furthermore, it has been posited that educational institutions and care facilities serve as environments conducive to the enhancement of children's social and pragmatic aptitudes, as asserted by Matson et al (2009). The empirical results of the present investigation are in substantial concurrence with the aforementioned assertion. The utilization of gender as a variable has demonstrated efficacy in identifying dissimilarities between male and female populations in the progression of pragmatic communicative abilities among children with autism.

Furthermore, the results of the study indicate that female children with autism exhibit more pronounced pragmatic deficits when compared to their male counterparts. The present study's results align with those of Begeer et al. (2012), which demonstrated diminished communicative, social, as well as cognitive capabilities in female individuals with ASD relative to their male counterparts. The study conducted by Frazier et al. (2014) revealed that females exhibited more severe social communication

deficits and weaker adaptive abilities relative to their male counterparts. Moreover, Ryder's (2017) study revealed that women diagnosed with autism encountered challenges in participating in social discourse.

- Thirdly, the researcher posited that there exists a correlation between the acquisition of grammatical skills, as measured by mean length of utterance (MLU), in children with ASD and their attendance at educational institutions and care facilities. The present study investigated the correlation between children's mean length of utterance (MLU) and their age, gender, and level of education. The findings of the study provide support for the aforementioned hypothesis. A significant correlation has been observed between the mean length of utterance (MLU) scores of children and their school attendance. The findings of the study indicate that individuals who exhibit consistent attendance at educational institutions demonstrate comparatively elevated mean length of utterance (MLU) scores.

In summary, the current investigation elucidates certain findings pertaining to the pragmatic development of children with autism spectrum disorder with respect to four variables, namely age, gender, mean length of utterance, and level of education. Furthermore, this study contributes to the development of a comprehensive theoretical framework regarding the developmental paths of pragmatic abilities in individuals with autism spectrum disorder (ASD) and their correlation with grammatical development, as evidenced by the mean length of utterance (MLU) scores of ASD children. Additionally, this research explores the potential impact of education on enhancing pragmatic communicative skills in this population.

Based on the preceding discussions, the methodology employed in the investigation, and the examination of pertinent literature, the ensuing suggestions are posited to offer guidance to caregivers, educators, and practitioners in the field of autism care, as well as scholars with an interest in comprehending the pragmatic development of children with autism.

Initially, several observations are delineated regarding the pragmatic communicative skills development in children diagnosed with ASD. Hence, it is recommended that professionals in the fields of psychology, pathology, speech therapy, and neurology utilize these observations in their comparative analyses of the pragmatic competencies exhibited by children with autism in relation to those who are hearing impaired, maltreated, or afflicted with mental disorders. The findings derived from the investigation can aid in determining the extent to which growth and maturation fall within the typical spectrum, exhibit a delay, or manifest atypical characteristics.

The current investigation is delimited to Algerian children diagnosed with autism spectrum disorder (ASD) within the age range of 5 to 17 years. Henceforth, forthcoming research on the pragmatic development of autistic individuals in the Arab region should be focused on examining the cohorts of bilingual or culturally diverse children, adolescents, and adults.

The present investigation is delimited to the examination of development in a mere 30 pragmatic parameters, encompassing verbal acts, paralinguistic features, and nonverbal aspects. Subsequent scholarly inquiry should be focused on the subsequent areas of developmental pragmatics: the conversational devices and communicative intent of children with autism, the progression of their narrative abilities, their proficiency in adhering to politeness conventions, and their comprehension of pragmatic language use.

The current investigation examines the pragmatic development of children with respect to four variables, namely age, gender, mean length of utterance (MLU), and educational background. Henceforth, it is recommended that forthcoming research endeavors delve into the pragmatic development of children concerning the subsequent factors: educational attainment, partner gender, linguistic impairments, socioeconomic standing, milieu, and cross-cultural distinctions.

Subsequently, it is recommended that forthcoming researchers undertake an investigation of the identical objectives of this inquiry through alternative methodologies, such as the utilization of the Children Communication Checklist (CCC). This tool is to be dispensed to parents or caregivers, who can furnish supplementary insights regarding the facets of pragmatic development in autistic children that are arduous to evaluate via language sampling or deliberate elicitation assessments.

The researcher suggests that Mean Length of Utterance (MLU) be utilized as a reliable metric for assessing pragmatic and grammatical advancement in autistic children, instead of age, when examining overall language development.

Finally, subsequent investigations are encouraged to assess the dependability of Speech-Generating devices (SGD), which are portable electronic devices that emit pre-recorded vocabulary, in exploring the progression of pragmatic communicative skills among diverse classifications of children with cognitive impairments. The present analysis represents a significant stride towards elucidating the communicating symptoms that manifest in the conversation of individuals diagnosed with autism spectrum disorder.

## References

- Abrams, D. A., Lynch, C. J., Cheng, K. M., Phillips, J., Supekar, K., Ryali, S., Uddin, L. Q., & Menon, V. (2013). Under connectivity between voice-selective cortex and reward circuitry in children with autism. *Proceedings of the National Academy of Sciences of the United States of America*, *110*(29), 12060–12065. <https://doi.org/10.1073/pnas.1302982110>
- Abubakar, A., Ssewanyana, D., & Newton, C. R. (2016). A Systematic Review of Research on Autism Spectrum Disorders in Sub-Saharan Africa. *Behavioural neurology*, *2016*, 3501910. <https://doi.org/10.1155/2016/3501910>
- Adams, C. (2002). Practitioner review: The assessment of language pragmatics. *Journal of Child Psychology and Psychiatry*, *43*(8), 973–987. [Doi.org/10.1111/1469-7610](https://doi.org/10.1111/1469-7610).
- Adams, C., Cooke, R., Crutchley, A., Hesketh, A., & Reeves, D. (2001). *Assessment of comprehension and expression*. Windsor, UK: NFER-Nelson.
- Adams, J. B., Johansen, L. J., Powell, L. D., Quig, D., & Rubin, R. A. (2011). Gastrointestinal flora and gastrointestinal status in children with autism--comparisons to typical children and correlation with autism severity. *BMC gastroenterology*, *11*, 22. <https://doi.org/10.1186/1471-230X-11-22>
- Adams, R. B., Jr., & Nelson, A. J. (2016). Eye behavior and gaze. In D. Matsumoto, H. C. Hwang, & M. G. Frank (Eds.), *APA handbook of nonverbal communication* (pp. 335–362). Washington, DC: American Psychological Association. <https://doi.org/10.1037/14669-013>
- Aiello, J.R. (1987). Human spatial behavior. In D. Stokols and I. Altman (Eds.), *Handbook of environmental psychology*. New York: John Wiley & Sons, pp. 359-504.
- Alibali, M., Bassok, M., Solomon, K., Syc, S., & Goldin-Meadow, S. (1999). Illuminating mental representations through speech and gesture. *Psychological Science*, *10*(4), 327-

333.

- al-Mamari, W., Idris, A. B., Dakak, S., al-Shekaili, M., al-Harhi, Z., Alnaamani, A. M., Alhinai, F. I., Jalees, S., al Hatmi, M., el- Naggari, M. A., & Islam, M. M. (2019). Revisiting the prevalence of autism spectrum disorder among Omani children: A multicenter study. *Sultan Qaboos University Medical Journal*, 19(4), e305.
- Alshaban, F., Aldosari, M., al-Shammari, H., el-Hag, S., Ghazal, I., Tolefat, M., Ali, M., Kamal, M., Abdel Aati, N., Abeidah, M., Saad, A. H., Dekair, L., al Khasawneh, M., Ramsay, K., & Fombonne, E. (2019). Prevalence and correlates of autism spectrum disorder in Qatar: A national study. *Journal of Child Psychology and Psychiatry*, 60, 1254–1268.
- American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders Fourth Edition Text Revision (DSM-IV-TR)*. Washington DC: American Psychiatric Association.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
- American Psychological Association. (2010). *Publication Manual of the American Psychological Association* (6th ed.). Washington DC: Author.
- American Speech-Language-Hearing Association. (1993). *Definitions of communication disorders and variations* [Relevant Paper]. Available from [www.asha.org/policy](http://www.asha.org/policy).
- American Speech-Language-Hearing Association. (2014). *Social language use (pragmatics)*. Retrieved From <http://www.asha.org/public/speech/development/Pragmatics>.
- and non-autistic retarded children. *Journal of Autism and Developmental Disorders*, 26, 611-620.
- Andersen, E. (1990). *Speaking with style: The sociolinguistic skills of children*. London,

England: Routledge.

- Anderson, N. H. (2008). *Unified social cognition*. New York, NY: Psychology Press.
- Andersson, G.W., Gillberg, C., & Miniscalco, C. (2013). Pre-school children with suspected autism spectrum disorders: Do girls and boys have the same profiles? *Research in Developmental Disabilities, 34*(1), 413–422. [PubMed: 23023300]
- Andrés-Roqueta, C., & Katsos, N. (2017). The contribution of grammar, vocabulary and theory of mind in pragmatic language competence in children with autistic spectrum disorders. *Frontiers in Psychology, 8*, 996.
- Argyle M, Dean J (1965) Eye-contact, distance and affiliation. *Sociometry, 28*: 289-304. doi:10.2307/2786027. PubMed: 14341239.
- Asp, E. D., & De Villiers, J. (2010). *When language breaks down: Analysing discourse in clinical contexts*. Cambridge University Press.
- Attwood, A. (2015). *The complete guide to Asperger's syndrome*. London: Jessica Kingsley.
- Attwood, T. (1988). *Asperger's syndrome: A guide for parents and professionals*. Philadelphia, USA: Jessica Kingsley Publishers.
- Avent, J. R., Wertz, R. T., Auther, L. L. (1998). Relationship between language impairment and pragmatic behavior in aphasic adults. *Journal of Neurolinguistics, 11*(1-2), 207-221. [https://doi.org/10.1016/S0911-6044\(98\)00014-1](https://doi.org/10.1016/S0911-6044(98)00014-1)
- Aviel-Shekler, K., Hamshawi, Y., Sirhan, W., Getselter, D., Srikanth, K. D., Malka, A., Piran, R., & Elliott, E. (2020). Gestational diabetes induces behavioral and brain gene transcription dysregulation in adult offspring. *Translational psychiatry, 10*(1), 412. <https://doi.org/10.1038/s41398-020-01096-7>
- Bailey, K. M. (2003). *Practical English language teaching*. New York: McGraw-Hill Contemporary.
- Baio J, Wiggins L, Christensen, D.L., Maenner, M.J., Daniels, J., Warren, Z., ... Dowling, N.F.

- (2018). Prevalence of autism spectrum disorder among children aged 8 years: Autism and developmental disabilities monitoring network, 11 Sites, United States, 2014. *MMWR Surveillance Summaries*, 67(6), 1–23.
- Baltaxe, C. A. (1977). Pragmatic deficits in the language of autistic adolescents. *Journal of Pediatric Psychology*, 2(4), 176–180. <https://doi.org/10.1093/jpepsy/2.4.176>
- Baltaxe, C, & D'Angiola, N. (1992). Cohesion in the discourse interaction of autistic, specific language impaired, and normal children. *Journal of Autism and Developmental Disorders*, 22(1), 1-21.
- Bargiela, S., Steward, R., & Mandy, W. (2016). The experiences of late-diagnosed women with autism spectrum conditions: An investigation of the female autism phenotype. *Journal of Autism and Developmental Disorders*, 46(10), 3281–3294. 10.1007/s10803-016-2872-8. [PubMed: 27457364]
- Bar-Haim, Y., Aviezer, O., Berson, Y., & Sagi, A. (2002). Attachment in infancy and personal space regulation in early adolescence. *Attach Hum Dev*, 4: 68-83. doi:10.1080/14616730210123111. PubMed: 12065031.
- Barnard-Brak, L., Thompson, S., Richman, D., & Wei, T. (2014). Assistive technology as a predictor of general or alternate assessment among elementary-aged students with Autism Spectrum Disorders. *Assistive Technology*, 26(2), 81-87.
- Baron-Cohen S., Leslie A. M., Frith U. (1985) ‘Does the Autistic Child have a “Theory of Mind”?’’, *Cognition* 21: 37–46.
- Baron-Cohen, S. (1992). Out of sight or out of mind? Another look at deception in autism. *Journal of Child Psychology and Psychiatry*, 33(7), 1141–1155.
- Baron-Cohen, S. (2000). Theory of mind and autism: A fifteen-year review. *Understanding other minds. Perspectives from developmental cognitive science*. Oxford: Oxford University Press.



- Begeer, S., Mandell, D., Wijnker-Holmes, B., Venderbosch, S., Rem, D., Stekelenburg, F., et al. (2013). Sex differences in the timing of identification among children and adults with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 43(5), 1151–1156. 10.1007/s10803-012-1656-z. [PubMed: 23001766]
- Beisler, J. M., Tsai, C. Y., & Von, K. D. (1987). Comparisons between autistic and non-autistic children on the test for auditory comprehension of language. *Journal of Autism and Developmental Disorders*, 17(1), 95–102.
- Belin, P., & Grosbras, M. H. (2010). Before Speech: Cerebral Voice Processing in Infants. *Neuron*, 65(6), 733–735. <https://doi.org/10.1016/j.neuron.2010.03.018>
- Belin, P., Fecteau, S., & Bédard, C. (2004). Thinking the voice: Neural correlates of voice perception. *Trends in Cognitive Sciences*, 8(3), 129-135. <https://doi.org/10.1016/j.tics.2004.01.008>
- Belin, P., Zatorre, R. J., Lafaille, P., Ahad, P., & Pike, B. (2000). Voice-selective areas in human auditory cortex. *Nature*, 403(6767), 309–312. <https://doi.org/10.1038/35002078>
- Belkadi, A. (2006). Language impairments in autism: Evidence against mind-blindness. *SOAS Working Papers in Linguistic*. 14(1), 3-13.
- Berman, R., & Slobin, D. I. (Eds.). (1994). *Relating events in narrative: A cross-linguistic developmental study*. Hillsdale, NJ: Erlbaum.
- Bernard, H. (1994). *Research methods in anthropology: qualitative and quantitative approaches* (2<sup>nd</sup> Ed.). Walnut Creek, CA: Alta Mira Press.
- Bernard, H. R. (2011). *Research methods in anthropology: Qualitative and quantitative approaches* (5<sup>th</sup> Ed.). Lanham, MD: Rowman & Littlefield.
- Bernard, H. R. (2013). *Social research methods: Qualitative and quantitative approaches* (2<sup>nd</sup> Ed.). Thousand Oaks, CA: Sage.
- Best, C. S., Moffat, V. J., Power, M. J., Owens, D. G., C., & Johnstone, E. C. (2008). The

- boundaries of the cognitive phenotype of autism: Theory of mind, central coherence and ambiguous figure perception in young people with autistic traits. *Journal of Autism and Developmental Disorders*, 38 (5), 840-7.
- Bidet-Caulet A., Latinus M., Roux S., Malvy J., Bonnet-Brilhault F., Bruneau N. (2017). Atypical sound discrimination in children with ASD as indicated by cortical ERPs. *Journal of Neurodevelopmental Disorders.*, 9, 13. 10.1186/s11689-017-9194-9
- Biel, L. (2012, December 3). *Raising a sensory smart child*, Autism Research Institute Conference [Video]. YouTube.
- Birner, B. J. (2013). *Introduction to Pragmatics*. Southern Gate: John Wiley & Sons Ltd.
- Bishop, D. V. M. (1998). Development of the children's communication checklist (CCC): A method for assessing qualitative aspects of communicative impairment in children. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 39 (6), 879-891.
- Bishop, D.V.M., & Rosenbloom, L. (1987). Classification of childhood language disorders. In W. Yule & M. Rutter (Eds.), *Language development and disorders*. Clinics in developmental medicine (double issue). London: Mac Keith Press.
- Bjørklund, G., Pivina, L., Dadar, M., Meguid, N. A., Semenova, Y., Anwar, M., & Chirumbolo, S. (2020). Gastrointestinal alterations in autism spectrum disorder: What do we know?. *Neuroscience and biobehavioral reviews*, 118, 111–120. <https://doi.org/10.1016/j.neubiorev.2020.06.033>
- Blake, J., Hoyme, H. E., & Crotwell, P. L. (2013). A brief history of autism, the autism/vaccine hypothesis and a review of the genetic basis of autism spectrum disorders. *South Dakota medicine: the journal of the South Dakota State Medical Association*, Spec no, 58–65.
- Block, E., (1986). The comprehension strategies of second language readers. *TESOL Quarterly*, 20(3), 463-494.
- Blume, J., Wittke, K., Naigles, L., & Mastergeorge, A. M. (2021). Language Growth in Young

- Children with Autism: Interactions Between Language Production and Social Communication. *Journal of autism and developmental disorders*, 51(2), 644–665.  
<https://doi.org/10.1007/s10803-020-04576-3>
- Blum-Kulka, S. (1997). *Dinner talk: Cultural patterns of sociability and socialization in family discourse*. Mahwah, NJ: Erlbaum.
- Blum-Kulka, S., & Snow, C. (Eds.). (2002). *Talking with adults: The contribution of multiparty talk to language development*. Mahwah, NJ: Erlbaum.
- Blum-Kulka, S., Huch-Taglicht, D., & Avni, H. (2004). The social and discursive spectrum of peer talk. *Discourse Studies*, 6, 307–28.
- Bogdashina, O. (2006). *Theory of mind and the triad of perspectives on autism and Asperger syndrome: A view from the bridge*. Philadelphia: Jessica Kingsley Publishers.
- Bölte, S., Girdler, S., and Marschik, P. B. (2019). The contribution of environmental exposure to the etiology of autism spectrum disorder. *Cell. Mol. Life Sci.* 76, 1275–1297. doi: 10.1007/s00018-018-2988-4
- Boyd, A. T., Cookson, S. T., Anderson, M., Bilukha, O. O., Brennan, M., Handzel, T., Hardy, C., Husain, F., Cardozo, B. L., Colorado, C. N., Shahpar, C., Talley, L., Toole, M., & Gerber, M. (2017). Centers for Disease Control and Prevention Public Health Response to Humanitarian Emergencies, 2007-2016. *Emerging infectious diseases*, 23(13), S196–S202. <https://doi.org/10.3201/eid2313.170473>
- Boyle M. P. (2015). Relationships between psychosocial factors and quality of life for adults who stutter. *American journal of speech-language pathology*, 24(1), 1–12.  
[https://doi.org/10.1044/2014\\_AJSLP-14-0089](https://doi.org/10.1044/2014_AJSLP-14-0089)
- Brandt, R. (1972). *Studying behavior in natural settings*. New York: Holt, Rinehart and Winston.
- Breen, J., & Hare, D. J. (2017). The nature and prevalence of catatonic symptoms in young

- people with autism. *Journal of Intellectual Disability Research*, 61(6), 580–593. <https://doi.org/10.1111/jir.12362>.
- Breheny, R. (2006). Communication and folk psychology. *Mind and Language*, 21(1), 74–107.
- Brink, H. (2006). *Fundamentals of Research Methodology for Health Care Professionals*. (2<sup>nd</sup> Ed.) Cape Town: Juta.
- Broder Fingert, S., Carter, A., Pierce, K., Stone, W. L., Wetherby, A., Scheldrick, C., Smith, C., Bacon, E., James, S. N., Ibañez, L., & Feinberg, E. (2019). Implementing systems-based innovations to improve access to early screening, diagnosis, and treatment services for children with autism spectrum disorder: An Autism Spectrum Disorder Pediatric, Early Detection, Engagement, and Services network study. *Autism: the international journal of research and practice*, 23(3), 653–664. <https://doi.org/10.1177/1362361318766238>
- Bromley, D.B. (1986). *The case-study method in psychology and related disciplines*. New York: John Wiley & Sons.
- Brook, S., & Bowler, D. (1992). Autism by another name? Semantic and pragmatic impairments in children, *Journal of Autism and Developmental Disorders* 22(1), 61–81.
- Broome, K., McCabe, P., Docking, K., Doble, M., & Carrigg, B. (2022). Speech Development Across Subgroups of Autistic Children: A Longitudinal Study. *Journal of autism and developmental disorders*, 1(17), 1080-1120.
- Brown, R. (1973). *A first language: The early stages*. Cambridge: Harvard University Press.
- Bruner, J. S. (1975). The ontogenesis of speech acts. *Journal of Child Language*, 2(1), 1–19. [doi:10.1017/S0305000900000866](https://doi.org/10.1017/S0305000900000866)
- Bruner, J. S. (1983). *Child's talk: Learning to use language*. New York: Norton.
- Brunsdon, V. E. A., Colvert, E., Ames, C., Garnett, T., Gillan, N., Hallett, V., Lietz, S., Woodhouse, E., Bolton, P., & Happé, F. (2015). Exploring the cognitive features in

- children with autism spectrum disorder, their co-twins, and typically developing children within a population-based sample. *Journal of Child Psychology & Psychiatry*, 56 (8), 893–902.
- Buie, T., Campbell, D. B., Fuchs, G. J., 3rd, Furuta, G. T., Levy, J., Vandewater, J., Whitaker, A. H., Atkins, D., Bauman, M. L., Beaudet, A. L., Carr, E. G., Gershon, M. D., Hyman, S. L., Jirapinyo, P., Jyonouchi, H., Kooros, K., Kushak, R., Levitt, P., Levy, S. E., Lewis, J. D., ... Winter, H. (2010). Evaluation, diagnosis, and treatment of gastrointestinal disorders in individuals with ASDs: a consensus report. *Pediatrics*, 125 Suppl 1, S1–S18. <https://doi.org/10.1542/peds.2009-1878C>
- Butman, J., Allegri, R., Harris, P., & Drake, M. (2000). Fluencia verbal en Español, datos normativos en Argentina. *Medicina (Buenos Aires)*, 60: 561–564.
- Butterworth, G., & Morissette, P. (1996). Onset of pointing and the acquisition of language in infancy. *Journal of Reproductive and Infant Psychology*, 14(3), 219–232.
- Byrne, D. (1986). *Teaching Oral English*. Cambridge: Cambridge University Press.
- Campbell, D., (1975). Degrees of freedom and the case study. *Comparative Political Studies*, 8, 178–185.
- Campisi, P., Low, A., Papsin, B., Mount, R., Cohen-Kerem, R., & Harrison, R. (2005). Acoustic analysis of the voice in pediatric cochlear implant recipients: a longitudinal study. *The Laryngoscope*, 115(6), 1046–1050.
- Capps, L., Kehres, J., & Sigman, M. (1998). Conversational abilities among children with autism and children with developmental delays. *Autism*, 2(4), 325–344. <https://doi.org/10.1177/1362361398024002>
- Carlson, S. M., & Moses, L. J. (2001). Individual differences in inhibitory control and children's theory of mind. *Child Development*. 72(1), 1032–1053.
- Carpenter, A. E., & Strong, J. C. (1988). Pragmatic development in normal children: assessment

- of a testing protocol. *NSSLHA Journal*, 16(1), 40-49.
- Carpentieri, S., & Morgan, S. B. (1996). Adaptive and intellectual functioning in autistic
- Carta, J. J., & Greenwood, C. (1987). Process-product analysis: An approach for studying critical variables in early intervention. *Journal of Early Intervention*, 12(1), 85-91.
- Carter, A.S., Black, D.O., Tewani, S., Connolly, C.E., Kadlec, M.B., & Tager-Flusberg, H. (2007). Sex differences in toddlers with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 37(1), 86–97. 10.1007/s10803-006-0331-7. [PubMed: 17216333]
- Cashin, A., Sci, D. A., & Barker, P. (2009). The triad of impairment in autism revisited. *Journal of child and adolescent psychiatric nursing: official publication of the Association of Child and Adolescent Psychiatric Nurses, Inc*, 22(4), 189–193. <https://doi.org/10.1111/j.1744-6171.2009.00198.x>
- Cassidy, J., & Berlin, L. J. (1994) The insecure/ambivalent pattern of attachment: Theory and research. *Child Dev*, 65: 971-991. doi: 10.2307/1131298. PubMed: 7956474.
- Cekaite, A. (2007). A child's development of interactional competence in a Swedish L2 classroom. *The Modern Language Journal*, 91, 45–62.
- Cekaite, A., & Aronsson, K. (2004). Repetition and joking in children's second language conversations. Playful recycling in an immersion classroom. *Discourse Studies*, 6, 373–92.
- Chambers, F. (1997). What do we mean by fluency? *System*, 25(4), 535-544.
- Charmaz, K. (2014). *Constructing grounded theory* (2<sup>nd</sup> Ed.). Thousand Oaks, CA: Sage.
- Cherulnik, P. D., Neely, W. T., Flanagan, M., & Zachau, M. (1978). Social skill and visual interaction. *The Journal of Social Psychology*, 104(2), 263–270. <https://doi.org/10.1080/00224545.1978.9924068>
- Chevallier, C., Kohls, G., Troiani, V., Brodtkin, E. S., & Schultz, R. T. (2012). The social

- motivation theory of autism. *Trends in Cognitive Sciences*, 16(4), 231–239. <https://doi.org/10.1016/j.tics.2012.02.007>
- Chinawa, J. M., Manyike, P. C., Aniwada, E. C., Chinawa, A. T., Obu, H. A., Odetunde, O. I., Nwokocha, A. R., & Ibekwe, R. R. (2016). Prevalence and socioeconomic correlates of autism among children attending primary and secondary schools in south east Nigeria. *African health sciences*, 16(4), 936–942. <https://doi.org/10.4314/ahs.v16i4.8>
- Choque Olsson, N., Rautio, D., Asztalos, J., Stoetzer, U., & Bölte, S. (2016). Social skills group training in highfunctioning autism: A qualitative responder study. *Autism*, 20(8), 995–1010.
- Christensen, D. L., Baio, J., Van Naarden Braun, K., Bilder, D., Charles, J., Constantino, J. N., Daniels, J., Durkin, M. S., Fitzgerald, R. T., Kurzius-Spencer, M., Lee, L. C., Pettygrove, S., Robinson, C., Schulz, E., Wells, C., Wingate, M. S., Zahorodny, W., Yeargin-Allsopp, M., & Centers for Disease Control and Prevention (CDC) (2016). Prevalence and Characteristics of Autism Spectrum Disorder Among Children Aged 8 Years--Autism and Developmental Disabilities Monitoring Network, 11 Sites, United States, 2012. *Morbidity and mortality weekly report. Surveillance summaries (Washington, D.C.: 2002)*, 65(3), 1–23. <https://doi.org/10.15585/mmwr.ss6503a1>
- Christensen, D. L., Maenner, M. J., Bilder, D., Constantino, J. N., Daniels, J., Durkin, M. S., Fitzgerald, R. T., Kurzius-Spencer, M., Pettygrove, S. D., Robinson, C., Shenouda, J., White, T., Zahorodny, W., Pazol, K., & Dietz, P. (2019). Prevalence and characteristics of autism spectrum disorder among children aged 4 years—Early autism and developmental disabilities monitoring network, seven sites, United States, 2010, 2012, and 2014. *MMWR Surveillance Summaries*, 68(2), 1–19.
- Clancy, P. (1986). The acquisition of communicative style in Japanese. In B. Shieffelin & E. Ochs (Eds.), *Language socialization across cultures* (pp. 213–51). Cambridge, England:

Cambridge University Press.

- Clark, E. V. (2004). Pragmatics and language acquisition. In Horn, L. R. & Ward, G. (eds.), *Handbook of pragmatics* (pp. 562-577). Oxford: Blackwell.
- Cobb, T. (1999). Breadth and depth of lexical acquisition with hands-on concordance. *Computer Assisted Language Learning*, 12(4), 345-360.  
<http://dx.doi.org/10.1076/call.12.4.345.5699>
- Condy, E. E., Scarpa, A., & Friedman, B. H. (2019). Restricted repetitive behaviors in autism spectrum disorder: A systematic review from the neurovisceral integration perspective. *Biological Psychology*, 148, 107739.
- Constantino, J. N., Charman, T., & Jones, E. J. H. (2021). Clinical and translational implications of an emerging developmental substructure for autism. *Annual Review of Clinical Psychology*, 17(1), 365–389. <https://doi.org/10.1146/annurev-clinpsy-081219-110503>
- Conti-Ramsden, G., & Gunn, M. (1986). The development of conversational disability: A case study. *British Journal of Disorders of Communication*, 21(3), 339–351. <https://doi.org/10.3109/13682828609019846>
- Corbett, B. A., Schwartzman, J. M., Libsack, E. J., Muscatello, R. A., Lerner, M. D., Simmons, G. L., & White, S. W. (2021). Camouflaging in Autism: Examining Sex-Based and Compensatory Models in Social Cognition and Communication. *Autism research: official journal of the International Society for Autism Research*, 14(1), 127–142.  
<https://doi.org/10.1002/aur.2440>
- Coretti, L., Paparo, L., Riccio, M. P., Amato, F., Cuomo, M., Natale, A., Borrelli, L., Corrado, G., Comegna, M., Buommino, E., Castaldo, G., Bravaccio, C., Chiariotti, L., Berni Canani, R., & Lembo, F. (2018). Gut Microbiota Features in Young Children With Autism Spectrum Disorders. *Frontiers in microbiology*, 9, 3146.

<https://doi.org/10.3389/fmicb.2018.03146>

- Costa, C., Cristea, I. A., Dal Bò, E., Melloni, C., & Gentili, C. (2021). Brain activity during facial processing in autism spectrum disorder: an activation likelihood estimation (ALE) meta-analysis of neuroimaging studies. *Journal of child psychology and psychiatry, and allied disciplines*, 62(12), 1412–1424. <https://doi.org/10.1111/jcpp.13412>
- Courchesne, E., Campbell, K., & Solso, S. (2011). Brain growth across the life span in autism: age-specific changes in anatomical pathology. *Brain research*, 1380, 138–145. <https://doi.org/10.1016/j.brainres.2010.09.101>
- Craig, A., & Tran, Y. (2014). Trait and social anxiety in adults with chronic stuttering: conclusions following meta-analysis. *Journal of fluency disorders*, 40, 35–43. <https://doi.org/10.1016/j.jfludis.2014.01.001>
- Creaghead, N. (1984). Strategies for evaluating and testing pragmatic behaviour in young children. *Seminars in Speech and Language*, 5(1), 241-251.
- Creswell, J. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage.
- Creswell, J. A. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed.). Thousand Oaks, CA: Sage.
- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (4th ed.). Thousand Oaks, CA: Sage.
- Creswell, J. W., Fetters, M. D., & Ivankova, N. V. (2004). Designing a mixed methods study in primary care. *Annals of family medicine*, 2(1), 7–12. <https://doi.org/10.1370/afm.104>
- Cristani, M., Paggetti, G., Vinciarelli, A., Bazzani, L., Menegaz, G. and Murino, V. (2011) Towards computational proxemics: Inferring social relations from interpersonal distances. In: 3rd IEEE International Conference on Social Computing, Boston, USA, 9-11 Oct 2011, pp. 290-297.

- Croen, L. A., Zerbo, O., Qian, Y., Massolo, M. L., Rich, S., Sidney, S., & Kripke, C. (2015). The health status of adults on the autism spectrum. *Autism : the international journal of research and practice*, *19*(7), 814–823. <https://doi.org/10.1177/1362361315577517>
- Cryan, J. F., O'Riordan, K. J., Cowan, C. S. M., Sandhu, K. V., Bastiaanssen, T. F. S., Boehme, M., Codagnone, M. G., Cusotto, S., Fulling, C., Golubeva, A. V., Guzzetta, K. E., Jaggard, M., Long-Smith, C. M., Lyte, J. M., Martin, J. A., Molinero-Perez, A., Moloney, G., Morelli, E., Morillas, E., O'Connor, R., Dinan, T. G. (2019). The Microbiota-Gut-Brain Axis. *Physiological reviews*, *99*(4), 1877–2013. <https://doi.org/10.1152/physrev.00018.2018>
- Cummings, L. (2009). *Clinical pragmatics*. New York: Cambridge University Press.
- Dale, P. S. (1980). Is early pragmatic development measurable? *Journal of Child Language*, *7*(1), 1-12.
- Davis, J., McKone, E., Zirnsak, M., Moore, T., O'Kearney, R., Apthorp, D., & Palermo, R. (2017). Social and attention-to-detail subclusters of autistic traits differentially predict looking at eyes and face identity recognition ability. *British Journal of Psychology*, *108*(1), 191–219. <https://doi.org/10.1111/bjop.12188>
- De Angelis, M., Francavilla, R., Piccolo, M., De Giacomo, A., & Gobbetti, M. (2015). Autism spectrum disorders and intestinal microbiota. *Gut microbes*, *6*(3), 207–213. <https://doi.org/10.1080/19490976.2015.1035855>
- De Angelis, M., Piccolo, M., Vannini, L., Siragusa, S., De Giacomo, A., Serrazanetti, D. I., Cristofori, F., Guerzoni, M. E., Gobbetti, M., & Francavilla, R. (2013). Fecal microbiota and metabolome of children with autism and pervasive developmental disorder not otherwise specified. *PLoS one*, *8*(10), e76993. <https://doi.org/10.1371/journal.pone.0076993>
- de Leon, L. (1998). The emergent participant: Interactive patterns in the socialization of Tzeltzil

- (Mayan) infants. *Journal of Linguistic Anthropology*, 8(2), 131–61.
- de Magistris, L., Familiari, V., Pascotto, A., Sapone, A., Frolli, A., Iardino, P., Carteni, M., De Rosa, M., Francavilla, R., Riegler, G., Militerni, R., & Bravaccio, C. (2010). Alterations of the intestinal barrier in patients with autism spectrum disorders and in their first-degree relatives. *Journal of pediatric gastroenterology and nutrition*, 51(4), 418–424. <https://doi.org/10.1097/MPG.0b013e3181dcc4a5>
- de Munck, C. & Sobo, J. (Eds) (1998). *Using methods in the field: a practical introduction and casebook*. Walnut Creek, CA: Alta Mira Press.
- de Villiers, J., Fine, J., Ginsberg, G., Vaccarella, L., & Szatmari, P. (2006). Brief report: A scale for rating conversational impairment in autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 37(7), 1375–1380.
- de Walt, M. & De Walt, R. (2002). *Participant observation: a guide for field workers*. Walnut Creek, CA: Alta Mira Press.
- de Walt, M. & DeWalt, R. (1998). Participant observation. In H. Russell Bernard (Ed.), *Handbook of methods in cultural anthropology* (pp.259-300). Walnut Creek: Alta Mira Press.
- Dean, M., Harwood, R., & Kasari, C. (2017). The art of camouflage: Gender differences in the social behaviors of girls and boys with autism spectrum disorder. *Autism*, 21(6), 678–689. 10.1177/1362361316671845. [PubMed: 27899709]
- deMunck, V. C. & Sobo, E. J. (Eds) (1998). *Using methods in the field: a practical introduction and casebook*. Walnut Creek, CA: Alta Mira Press.
- D'Eufemia, P., Celli, M., Finocchiaro, R., Pacifico, L., Viozzi, L., Zaccagnini, M., Cardi, E., & Giardini, O. (1996). Abnormal intestinal permeability in children with autism. *Acta paediatrica (Oslo, Norway: 1992)*, 85(9), 1076–1079. <https://doi.org/10.1111/j.1651-2227.1996.tb14220.x>

- developmental disorders* (4th ed., pp. 230–262). Hoboken: Wiley.
- deWalt, M. & De Walt, R. (2002). *Participant observation: a guide for field workers*. Walnut Creek, CA: Alta Mira Press.
- Dominick, K. C., Davis, N. O., Lainhart, J., Tager-flusberg, H., & Folstein, S. (2007). Atypical behaviors in children with autism and children with a history of language impairment. *Research in Developmental Disabilities, 28*(2), 145–162.
- Donnellan, A. M., Hill, D. A., & Leary, M. R. (2013) Rethinking autism: Implications of sensory and movement differences for understanding and support. *Frontiers in Integrative Neuroscience*. <https://doi.org/10.3389/fnint.2012.00124>.
- Dorval, B., & Eckerman, C. O. (1984). Developmental trends in the quality of conversation achieved by small groups of acquainted peers. *Monographs of the Society for Research in Child Development, 49*(2), 1–72.
- Dosey, M. A., Meisels, M. (1969). Personal space and self-protection. *J Pers Soc Psychol, 11*: 93-97. doi:10.1037/h0027040. PubMed: 5778351.
- Dromi, E., & Berman, R. A. (1982). A morphemic measure of early language development: Data from Modern Hebrew. *Journal of Child Language, 9*(1), 403-424.
- Dronker, N.F., Ludy, C. A., Redfern, B.B. (1998). Pragmatics in the absence of verbal language: Descriptions of a severe aphasic and a language deprived adult. *Journal of Neurolinguistics, 11*, 179-190. [https://doi.org/10.1016/S0911-6044\(98\)00012-8](https://doi.org/10.1016/S0911-6044(98)00012-8)
- Duff, P. (1990). Developments in the case study approach to second language acquisition research. In T. Hayes & K. Yoshioka (Eds.), *Proceedings of the First Conference on Second Language Acquisition and Teaching* (pp. 34– 87). Tokyo: International University of Japan.
- Durkin, M. S., Maenner, M. J., Baio, J., Christensen, D., Daniels, J., Fitzgerald, R., Imm, P., Lee, L. C., Schieve, L. A., van Naarden Braun, K., Wingate, M. S., & Yeargin-Allsopp,

- M. (2017). Autism spectrum disorder among US children (2002–2010): Socioeconomic, racial, and ethnic disparities. *American Journal of Public Health, 107*(11), 1818–1826.
- Durrheim, K. (2004). Research design. In M. Terre Blanche & K. Durrheim (Eds.), *Research in practice: Applied methods for the social sciences*. Cape Town: UCT Press.
- Dworzynski, K., Ronald, A., Bolton, P., & Happé, F. (2012). How different are girls and boys above and below the diagnostic threshold for autism spectrum disorders? *Journal of the American Academy of Child and Adolescent Psychiatry, 51*(8), 788–797. 10.1016/j.jaac.2012.05.018. [PubMed: 22840550]
- Eales, M. J. (1993). Pragmatic impairments in adults with childhood diagnoses of autism or developmental receptive language disorder. *Journal of Autism and Developmental Disorders, 23*(4), 593–617. <https://doi.org/10.1007/BF01046104>
- Egorova, O., Myte, R., Schneede, J., Hägglöf, B., Bölte, S., Domellöf, E., IvarsA'roch, B., Elgh, F., Ueland, P. M., & Silfverdal, S. A. (2020). Maternal blood folate status during early pregnancy and occurrence of autism spectrum disorder in offspring: a study of 62 serum biomarkers. *Molecular autism, 11*(1), 7. <https://doi.org/10.1186/s13229-020-0315-z>
- Egri, C. P. & Herman, S. (2000). Leadership in the North American Environmental Sector: Values, Leadership Styles, and Contexts of Environmental Leaders and their Organizations, *Academy of Management Journal, 43*, 571-604.
- Eibl-Eibesfeldt, I. (1989). *Human ethology*. Hawthorne, NY: Aldine de Gruyter.
- Eisenberg, S. L., Fersko, T. M., & Lundgren, C. (2001). The use of MLU for identifying language impairment in preschool children: A review. *American Journal of Speech-Language Pathology, 10*(5), 323- 342.
- Eisenmajer, R., & Prior, M. (1991). Cognitive linguistic correlates of "theory of mind" ability in autistic children. *British Journal of Developmental Psychology, 9*(1), 351-364.
- Elsabbagh M. (2020). Linking risk factors and outcomes in autism spectrum disorder: is there

- evidence for resilience?. *BMJ (Clinical research ed.)*, 368, 16880.  
<https://doi.org/10.1136/bmj.16880>
- Elsabbagh, M., Divan, G., Koh, Y. J., Kim, Y. S., Kauchali, S., Marcín, C., Montiel-Nava, C., Patel, V., Paula, C. S., Wang, C., Yasamy, M. T., & Fombonne, E. (2012). Global prevalence of autism and other pervasive developmental disorders. *Autism Research*, 5(3), 160–179.
- Elsabbagh, M., Divan, G., Koh, Y.J., Kim, Y.S., Kauchali, S., Marcin, C., et al. (2012). Global prevalence of autism and other pervasive developmental disorders. *Autism Research*, 5, 160-179.
- Erlanson, D. A., Harris, E. L., Skipper, B. L. & Allen, S. D. (1993). *Doing naturalistic inquiry: a guide to methods*. Newbury Park, CA: Sage.
- Ervin-Tripp, S. (1979). Children's verbal turn-taking. In E. Ochs & B. Shieffelin (Eds.), *Developmental pragmatics* (pp. 391–414). New York, NY: Academic Press.
- Ervin-Tripp, S., Guo, J., & Lampert, J. (1990). Politeness and persuasion in children's control acts. *Journal of Pragmatics*, 14, 307–31.
- Ervin-Tripp, S., & Susan, M. (2012). Pragmatics as a facilitator for child syntax development. In J. Verschueren, M. Michael and J. O. Östman (eds.). *Pragmaticizing understanding studies*, (pp. 77–100). Amsterdam: Benjamins, cop.
- Fairthorne, J., Jacoby, P., Bourke, J., de Klerk, N., & Leonard, H. (2016). Onset of maternal psychiatric disorders after the birth of a child with autism spectrum disorder: A retrospective cohort study. *Autism*, 20(1), 37-44.
- Fantini, A. (1985). *Language acquisition of a bilingual child*. Clevedon, England: Multilingual Matters.
- Faras, H., Al Ateeqi, N., & Tidmarsh, L. (2010). Autism spectrum disorders. *Annals of Saudi medicine*, 30(4), 295–300. <https://doi.org/10.4103/0256-4947.65261>

- Fatemi, S. H., & Folsom, T. D. (2013). Autism spectrum disorders and ataxia. In M. Manto, D. L. Gruol, J. Schmammann, N. Koibuchi & F. Rossi (Eds.), *Handbook of the cerebellum and cerebellar disorders* (pp. 1895–1906). Netherlands: Springer.
- Fatemi, S. H., Aldinger, K. A., Ashwood, P., Bauman, M. L., Blaha, C. D., Blatt, G. J., Chauhan, A., Chauhan, V., Dager, S. R., Dickson, P. E., Estes, A. M., Goldowitz, D., Heck, D. H., Kemper, T. L., King, B. H., Martin, L. A., Millen, K. J., Mittleman, G., Mosconi, M. W., Persico, A. M., ... Welsh, J. P. (2012). Consensus paper: pathological role of the cerebellum in autism. *Cerebellum (London, England)*, *11*(3), 777–807. <https://doi.org/10.1007/s12311-012-0355-9>
- Felipe, N.J., Sommer, R. (1966). Invasions of personal space. *Soc Probl*, *14*: 206-214. doi:10.2307/798618.
- Feyereisen, P., & de Lannoy, J. (1991). *Gestures and speech: Psychological investigations*. Cambridge, UK: Cambridge University Press.
- Fine, J., Bartolucci, G., Szatmari, P. et al (1994). Cohesive discourse in pervasive developmental disorders. *Journal of Autism Developmental Disorders*, *24*, 315–329. <https://doi.org/10.1007/BF02172230>
- Finegold, S. M., Dowd, S. E., Gontcharova, V., Liu, C., Henley, K. E., Wolcott, R. D., Youn, E., Summanen, P. H., Granpeesheh, D., Dixon, D., Liu, M., Molitoris, D. R., & Green, J. A., 3rd (2010). Pyrosequencing study of fecal microflora of autistic and control children. *Anaerobe*, *16*(4), 444–453. <https://doi.org/10.1016/j.anaerobe.2010.06.008>
- Fitzgerald, M., & Corvin, A. (2001). Diagnosis and differential diagnosis of Asperger syndrome. *Advances in Psychiatric Treatment*, *7*, 310-318.
- Flick, U. (2006). *An introduction to qualitative research*. London: Sage Publications.
- Fox, D. (1969). *The research process in education*. New York: Holt, Rinehart and Winston.
- Franz, L., Chambers, N., von Isenburg, M., de Vries PJ (2017). Autism spectrum disorder in

- sub-Saharan Africa: A comprehensive scoping review. *Autism Research*, 10, 723-749.  
doi: 10.1002/aur.1766.
- Fröhlich, H., Kollmeyer, M. L., Linz, V. C., Stuhlinger, M., Groneberg, D., Reigl, A., Zizer, E., Friebe, A., Niesler, B., & Rappold, G. (2019). Gastrointestinal dysfunction in autism displayed by altered motility and achalasia in *Foxp1<sup>+/-</sup>* mice. *Proceedings of the National Academy of Sciences of the United States of America*, 116(44), 22237–22245.  
<https://doi.org/10.1073/pnas.1911429116>
- Gadia, C. A., Tuchman, R., & Rotta, N. T. (2004). Autismo e doenças invasivas de desenvolvimento [Autism and pervasive developmental disorders]. *Jornal de pediatria*, 80(2 Suppl), S83–S94. <https://doi.org/10.2223/1172>
- Gagnon L., Mottron L., Joannette Y. (1997), Questionning the validity of the semantic-pragmatic syndrome diagnosis, *Autism*, 1 (1), 37-55.
- Gall, M.D., Gall, J.P., & Borg, W.T. (2003). *Educational research* (7<sup>th</sup> Ed.). White Plains, NY: Pearson Education.
- Gazdar, G. (1979). *Pragmatics: Implicature, presupposition, and logical form*. New York, NY: Academic Press.
- Gervais, H., Belin, P., Boddaert, N., Leboyer, M., Coez, A., & Sfaello, I. (2004). Abnormal cortical voice processing in autism. *Nat. Neurosci.*, 7, 801–802. 10.1038/nn1291
- Givón, T. (1989). *Mind, code and context: Essays in pragmatics*. New York, NY: Psychology Press.
- Gleason, J. Berko (Ed.) (2005, In Press). *The Development of Language* (6<sup>th</sup> Ed.). Boston: Pearson/Allyn & Bacon.
- Goodwin, M. H. (1990). *He-said-she-said: Talk as social organization among Black children*. Bloomington: Indiana University Press.
- Goren, C. C., Sarty, M., & Wu, P. Y. K. (1975). Visual following and pattern discrimination of

- face-like stimuli by newborn infants. *Pediatrics*, 56(4), 544–549.
- Gorkaltseva, E., Gozhin, A., & Nagel, O. (2015). Enhancing Oral Fluency as a Linguodidactic Issue. *Procedia - Social and Behavioral Sciences*, 206, 141-147.
- Grabrucker, A.M., (2021). *Autism Spectrum Disorder*. Brisbane, Australia: Exon Publications.
- Grassel, E. and Schirmer, B. (2006). The use of volunteers to support family caregivers of dementia patients: results of a prospective longitudinal study investigating expectations towards and experience with training and professional support. *Zeitschrift Fur Gerontologie Und Geriatrie*, 39 (3), 217-226.
- Gravetter, F. J., & Wallnau, L. B. (2000). *Statistics for the behavioral sciences (5th ed.)*. Belmont, CA: Wadsworth/Thompson learning.
- Gravetter, F. J., & Wallnau, L. B. (2005). *Essentials of statistics for the behavioral sciences*. Belmont, CA: Thomson/Wadsworth.
- Gravetter, F. J., & Wallnau, L. B. (2017). *Statistics to the behavioral sciences (10<sup>th</sup> Ed.)*. Cengage Learning. Chapter 15, “Correlation” (pp. 485–528) Chapter 16, “Introduction to Regression” (pp 529–558)
- Greenspan S. I. (1997). *The growth of the mind and the endangered origins of intelligence*. Reading, MA: Addison Wesley Longman
- Greenspan S. I., Wieder S. (1997). Developmental patterns and outcomes in infants and children with disorders in relating and communicating: A chart review of 200 cases of children with autistic spectrum diagnoses. *The Journal of Developmental and Learning Disorders*, 1, 87–141.
- Greenspan S. I., Wieder S. (1998). *The child with special needs: Intellectual and emotional growth*. Reading, MA: Addison Wesley Longman.
- Greenwood, C. R., Carta, J. J., Arreaga-Mayer, C., & Rager, A. (1991). The behavior analyst consulting model: Identifying and validating naturally effective instructional

- procedures. *Journal of Behavioral Education*, 1(2), 165-191.
- Grelotti, D. J., Gauthier, I., & Schultz, R. T. (2002). Social interest and the development of cortical face specialization: What autism teaches us about face processing. *Developmental Psychobiology*, 40(3), 213–225. <https://doi.org/10.1002/dev.10028>
- Grice, H.P. (1975). Logic and Conversation. In D. Davidson & G. Harman (Eds). *The logic of grammar*, Encino, CA: Dickenson, 64-75.
- Grossmann, T., Oberecker, R., Koch, S. P., & Friederici, A. D. (2010). The Developmental Origins of Voice Processing in the Human Brain. *Neuron*, 65(6), 852–858. <https://doi.org/10.1016/j.neuron.2010.03.001>
- Grundy, P. (2000). *Doing Pragmatics*. London: Edward Arnold.
- Gulsecen, S. and Kubat, A. (2006). Teaching ICT to teacher candidates using PBL: A qualitative and quantitative evaluation. *Educational Technology & Society*, 9(2), 96-106.
- Gutiérrez-Rexach, J., Schatz, S. (2016). Cognitive impairment and pragmatics. *SpringerPlus* (5), 127. <https://doi.org/10.1186/s40064-016-1759-7>
- Haar, S., Berman, S., Behrmann, M., & Dinstein, I. (2016). Anatomical Abnormalities in Autism?. *Cerebral cortex (New York, N.Y.: 1991)*, 26(4), 1440–1452. <https://doi.org/10.1093/cercor/bhu242>
- Hall, J. K., Hutton, S. B., & Morgan, M. J. (2010). Sex differences in scanning faces: Does attention to the eyes explain female superiority in facial expression recognition? *Cognition and Emotion*, 24(4), 629–637. <https://doi.org/10.1080/02699930902906882>
- Halliday, M., & Hasan, R. (1976). *Cohesion in English*. London: Longman.
- Halliday, M.A.K. (1975). *Learning to mean – Explorations in the development of language*. London: Edward Arnold.

- Halliday, M.A.K. (1975). *Learning to mean – Explorations in the development of language*. London: Edward Arnold.
- Hamed D. M (2019). Cohesion and Cooperation in Autistic Children’s Discourse. *Journal of Scientific Research in Arts*, 9, 42-67.
- Hamilton, A. (2016). Gazing at me: The importance of social meaning in understanding direct-gaze cues. *Philosophical Transactions of the Royal Society b: Biological Sciences*, 371, 20150080. <https://doi.org/10.1098/rstb.2015.0080>
- Hamzavi, J., Deutsch, W., Baumgartner, W. D., Bigenzahn, W., & Gstoettner, W. (2000). Short-term effect of auditory feedback on fundamental frequency after cochlear implantation. *Audiology: official organ of the International Society of Audiology*, 39(2), 102–105. <https://doi.org/10.3109/00206090009073060>
- Hannawa, A., & Spitzberg, B. (Eds.) (2015). *Communication competence*. Berlin: Walter de Gruyter.
- Happé, F. G. E. (1993). Communicative competence and theory of mind in autism. A test of relevance theory. *Cognition*, 48(2), 101–119.
- Happé, F. G. E. (1995). The role of age and verbal ability in the theory of mind task performance of subjects with autism. *Child Development*, 66(3), 843–855.
- Happé, F., & Frith, U. (2006). The weak coherence account: Detail-focused cognitive style in autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 36 (1), 5.
- Hart, B., & Risley, T. R. (1992). American parenting of language-learning children: Persisting differences in family-child interactions observed in natural home environments. *Developmental Psychology*, 28(6), 1096-1105.
- Hartley, S.L., & Sikora, D.M. (2009). Sex differences in autism spectrum disorder: an examination of developmental functioning, autistic symptoms, and coexisting behavior problems in toddlers. *Journal of Autism and Developmental Disorders*, 39(12), 1715–

1722. 10.1007/s10803-009-0810-8.

- Haslett, B.J. (1983). Communicative functions and strategies in children's conversations. *Human Communication Research*, 9(2), 114-129.
- Head, A.M., McGillivray, J.A., & Stokes, M.A. (2014). Gender differences in emotionality and sociability in children with autism spectrum disorders. *Molecular Autism*, 5(1), 19. 10.1186/2040-2392-5-19. [PubMed: 24576331]
- Heath, S.B. (1982). Questioning at home and at school: A comparative study. In G. Spindler (Ed.), *Doing the ethnography of schooling: Educational anthropology in action* (pp.103-127). New York: Holt, Rinehart and Winston.
- Heavey, L., Phillips, W., Baron-Cohen, S., & Rutter, M. (2000). The awkward moments test: A naturalistic measure of social understanding in autism. *Journal of Autism and Developmental Disorders*, 30(3), 395–406.
- Hewitt, A., Hall-Lande, J., Hamre, K., Esler, A. N., Punyko, J., Reichle, J., & Gulaid, A. A. (2016). Autism spectrum disorder (ASD) prevalence in Somali and non-Somali children. *Journal of Autism and Developmental Disorders*, 46(8), 2599–2608.
- Hickmann, M. (2003). *Children's discourse: Person, time and space across languages*. Cambridge, England: Cambridge University Press.
- Higgins, M. B., McCleary, E. A., & Schulte, L. (2001). Articulatory changes with short-term deactivation of the cochlear implants of two prelingually deafened children. *Ear and hearing*, 22(1), 29–45. <https://doi.org/10.1097/00003446-200102000-00004>
- Hill, E. L. (2004). Executive Dysfunction in Autism. *Trends in Cognitive Sciences*, 8, 26-32. <https://doi.org/10.1016/j.tics.2003.11.003>
- Hoff, E. (2006). How social contexts support and shape language development. *Developmental Review*, 26(1), 55-88.
- Holtmann, M., Bolte, S., & Poustka, F. (2007). Autism spectrum disorders: sex differences in

- autistic behaviour domains and coexisting psychopathology. *Developmental Medicine and Child Neurology*, 49(5), 361–366. 10.1111/j.1469-8749.2007.00361.x. [PubMed: 17489810]
- Hong, M., Lee, S. M., Park, S., Yoon, S.-J., Kim, Y.-E., & Oh, I.-H. (2020). Prevalence and economic burden of autism Spectrum disorder in South Korea using National Health Insurance Data from 2008 to 2015. *Journal of Autism and Developmental Disorders*, 50(1), 333–339.
- Hornby, A. S., & Cowie, A. P. (1986). *Oxford Advanced Learner's Dictionary of current English*. Oxford: Oxford Univ. Press.
- Hosenfeld, C. (1984). Case studies of ninth grade readers. In J. C. Alderson & A. H. Urquhart (Eds.), *Reading in a foreign language* (pp. 231–240). London: Longman.
- Hoyle, S. M. (1998). Register and footing in role play. In M. S. Hoyle & S. Adger (Eds.), *Kidstalk* (pp. 3–23). Oxford, England: Oxford University Press.
- Hsiao, E. Y., McBride, S. W., Chow, J., Mazmanian, S. K., & Patterson, P. H. (2012). Modeling an autism risk factor in mice leads to permanent immune dysregulation. *Proceedings of the National Academy of Sciences of the United States of America*, 109(31), 12776–12781. <https://doi.org/10.1073/pnas.1202556109>
- Huang, Y. (2014). *Pragmatics* (2<sup>nd</sup> Ed.). New York, NY: Oxford University Press.
- Hull, L., Mandy, W., & Petrides, K. (2017a). Behavioural and cognitive sex/gender differences in autism spectrum condition and typically developing males and females. *Autism*, 21(6), 706–727. 10.1177/1362361316669087. [PubMed: 28749232]
- Hull, L., Petrides, K.V., Allison, C., Smith, P., Baron-Cohen, S., Lai, M.C., et al. (2017b). “Putting on My Best Normal”: social camouflaging in adults with autism spectrum conditions. *Journal of Autism and Developmental Disorders*, 47(8), 2519–2534. 10.1007/s10803-017-3166-5. [PubMed: 28527095]

- Hymes, D. H. (1972). On communicative competence. In J. B. Pride & J. Holmes (Eds.), *Sociolinguistics* (pp. 269–93). Harmondsworth: Penguin.
- Im-Bolter, N., & Cohen, N. J. (2007). Language impairment and psychiatric comorbidities. *Pediatric Clinics of North America*, *54*(1), 525- 542. Doi: 10.1016/j.pcl.2007.02.008.
- Ingersoll, B., Dvortcsak, A., Whalen, C., & Sikora, D. (2005). The effects of a developmental, social-pragmatic language intervention on rate of expressive language production in young children with autistic spectrum disorders. *Focus on Autism and Other Developmental Disabilities*, *20*, 213-222.
- Iovannone, R., Dunlap, G., Huber, H., & Kincaid, D. (2003). Effective educational practices for students with autism spectrum disorders. *Focus On Autism and Other Developmental Disabilities*, *3*, 150.
- Itier, R. J., & Batty, M. (2009). Neural bases of eye and gaze processing: The core of social cognition. *Neuroscience & Biobehavioral Reviews*, *33*(6), 843–863. [https:// doi. org/ 10.1016/j. neubiorev. 2009. 02. 004](https://doi.org/10.1016/j.neubiorev.2009.02.004)
- Iverach, L., & Rapee, R. M. (2014). Social anxiety disorder and stuttering: current status and future directions. *Journal of fluency disorders*, *40*, 69–82. <https://doi.org/10.1016/j.jfludis.2013.08.003>
- Iverach, L., Jones, M., McLellan, L. F., Lyneham, H. J., Menzies, R. G., Onslow, M., & Rapee, R. M. (2016). Prevalence of anxiety disorders among children who stutter. *Journal of fluency disorders*, *49*, 13–28. <https://doi.org/10.1016/j.jfludis.2016.07.002>
- Jackson D. (2014). Business graduate performance in oral communication skills and strategies for improvement. *The International Journal of Management Education*, *12*, 22-34.
- James, D. M., Kozol, R. A., Kajiwarra, Y., Wahl, A. L., Storrs, E. C., Buxbaum, J. D., Klein, M., Moshiree, B., & Dallman, J. E. (2019). Intestinal dysmotility in a zebrafish (*Danio rerio*) *shank3a;shank3b* mutant model of autism. *Molecular autism*, *10*, 3.

<https://doi.org/10.1186/s13229-018-0250-4>

- Jansen, J.J.P., van den Bosch, F.A.J. & Volberda, H.W. (2005) Managing Potential and Realized Absorptive Capacity: How Do Organizational Antecedents Matter? *Academy of Management Review*, 48, 999-1015.
- Jariwala-Parikh, K., Barnard, M., Holmes, E. R., West-Strum, D., Bentley, J. P., Banahan, B., & Khanna, R. (2019). Autism prevalence in the Medicaid program and healthcare utilization and costs among adult enrollees diagnosed with autism. *Administration and Policy in Mental Health and Mental Health Services Research*, 46(6), 768–776.
- Johnson, B. & Onwuegbuzie, A. (2004). Mixed Methods Research: A Research Paradigm Whose Time Has Come. *Educational Researcher*, (33), 14-26.
- Johnson, M. H., Charman, T., Pickles, A., & Jones, E. J. H. (2021). Annual research review: anterior modifiers in the emergence of neurodevelopmental disorders (AMEND): A systems neuroscience approach to common developmental disorders. *Journal of Child Psychology and Psychiatry*, 62(5), 610–630. <https://doi.org/10.1111/jcpp.13372>
- Johnson, M. H., Gliga, T., Jones, E., & Charman, T. (2015). Annual Research Review: Infant development, autism, and ADHD: Early pathways to emerging disorders. *Journal of Child Psychology and Psychiatry*, 56(3), 228–247. <https://doi.org/10.1111/jcpp.12328>
- Johnson, M.P. (2006). Decision models for the location of community corrections centers. *Environment And Planning B-Planning & Design* 33 (3), 393-412 May.
- Jokiranta, E., Brown, A. S., Heinimaa, M., Cheslack-Postava, K., Suominen, A., & Sourander, A. (2013). Parental psychiatric disorders and autism spectrum disorders. *Psychiatry research*, 207(3), 203–211. <https://doi.org/10.1016/j.psychres.2013.01.005>
- Joliffe, T., & Baron-Cohen, S. (1999). The strange story test: A replication with high-functioning adults with autism or Asperger syndrome. *Journal of Autism and*

*Developmental Disorders*, 29(5), 395–406.

- Jones, W., & Klin, A. (2013). Attention to eyes is present but in decline in 2–6-month-old infants later diagnosed with autism. *Nature (London)*, 504(7480), 427–431. <https://doi.org/10.1038/nature12715>
- Jones, W., Carr, K., & Klin, A. (2008). Absence of preferential looking to the eyes of approaching adults predicts level of social disability in 2-year-old toddlers with autism spectrum disorder. *Archives of General Psychiatry*, 65(8), 946–954. <https://doi.org/10.1001/archpsyc.65.8.946>
- Jørgensen, N. J. (1998). Children's acquisition of code-switching for power-wielding. In P. Auer (Ed.), *Code-switching in conversation: Language, interaction and identity* (pp. 237–58). London, England: Routledge.
- Joseph, R. M., Tager-Flusberg, H., & Lord, C. (2002). Cognitive profiles and social-communicative functioning in children with autism spectrum disorder. *Journal of child psychology and psychiatry, and allied disciplines*, 43(6), 807–821. <https://doi.org/10.1111/1469-7610.00092>
- Kalra, V., Seth, R., Sapra, S. (2005). Autism --experiences in a tertiary care hospital. *Indian Journal of Pediatrics*, 72, 227-30.
- Kang, D. W., Adams, J. B., Gregory, A. C., Borody, T., Chittick, L., Fasano, A., Khoruts, A., Geis, E., Maldonado, J., McDonough-Means, S., Pollard, E. L., Roux, S., Sadowsky, M. J., Lipson, K. S., Sullivan, M. B., Caporaso, J. G., & Krajmalnik-Brown, R. (2017). Microbiota Transfer Therapy alters gut ecosystem and improves gastrointestinal and autism symptoms: an open-label study. *Microbiome*, 5(1), 10. <https://doi.org/10.1186/s40168-016-0225-7>
- Kang, D. W., Ilhan, Z. E., Isern, N. G., Hoyt, D. W., Howsmon, D. P., Shaffer, M., Lozupone, C. A., Hahn, J., Adams, J. B., & Krajmalnik-Brown, R. (2018). Differences in fecal

- microbial metabolites and microbiota of children with autism spectrum disorders. *Anaerobe*, 49, 121–131. <https://doi.org/10.1016/j.anaerobe.2017.12.007>
- Kang, D. W., Park, J. G., Ilhan, Z. E., Wallstrom, G., Labaer, J., Adams, J. B., & Krajmalnik-Brown, R. (2013). Reduced incidence of Prevotella and other fermenters in intestinal microflora of autistic children. *PLoS one*, 8(7), e68322. <https://doi.org/10.1371/journal.pone.0068322>
- Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous Child*, 2, 217–250.
- Kasambira, D. C. F. (2008). *Communicative Functions of Preschoolers and Their Mothers Across Cultures and Socioeconomic Status*. (Unpublished PhD Thesis). University of North Carolina, Chapel Hill, USA.
- Keen, D., Reid, F., & Arnone, D. (2010). Autism, ethnicity and maternal immigration. *The British Journal of Psychiatry*, 196(4), 274–281.
- Kelley, E., Paul, J. J., Fein, D., & Naigles, L. R. (2006). Residual language deficits in optimal outcome children with a history of autism. *Journal of Autism and Developmental Disorders*, 36, 807-828.
- Kelly, S. D., Singer, M., Hicks, J., & Goldin-Meadow, S. (2002). A helping hand in assessing children's knowledge: Instructing adults to attend to gesture. *Cognition & Instruction*, 20(1), 1-26.
- Kemper, A., Stringfield, S. & Teddlie, C. (2003). Mixed methods sampling strategies in social science research. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social & behavioral research* (pp. 273-296). Thousand Oaks, CA: Sage Publications.
- Kennedy, D.P, Adolphs, R. (2014). Violations of Personal Space by Individuals with Autism Spectrum Disorder. *PLoS ONE*, 9(8): e103369. <https://doi.org/10.1371/journal.pone.0103369>
- Kennedy, D.P, Gläscher, J., Tyszka, J.M., Adolphs, R. (2009). Personal space regulation by the

- human amygdala. *Nat Neurosci*, 12: 1226-1227. doi:10.1038/nn.2381. PubMed: 19718035.
- Kent, R., Weismer, G., Kent, J., & Rosenbek, J. (1989). Toward phonetic intelligibility testing in dysarthria. *Journal of Speech and Hearing Disorders*, 54, 482–499.
- Kim, H., Sefcik, J. S., & Bradway, C. (2017). Characteristics of qualitative descriptive studies: A systematic re-view. *Research in Nursing & Health*, 40(1), 23-42. <https://doi.org/10.1002/nur.21768>
- Kim, S. H., Junker, D., & Lord, C. (2014). Observation of Spontaneous Expressive Language (OSEL): a new measure for spontaneous and expressive language of children with autism spectrum disorders and other communication disorders. *Journal of autism and developmental disorders*, 44(12), 3230–3244. <https://doi.org/10.1007/s10803-014-2180-0>
- Kim, S. H., Paul, R., Tager-Flusberg, H., Lord, C., Volkmar, F. R., Paul, R., et al. (2014). Language and communication in autism language and communication in autism. In F. R. Volkmar, R. Paul, S. J. Rogers, & K. A. Pelphrey (Eds.), *Handbook of autism and pervasive*
- Kim, Y.S., et al. (2011). Prevalence of autism spectrum disorders in a total population sample. *American Journal of Psychiatry*, 168 (9), 904–12.
- Kirkovski, M., Enticott, P.G., & Fitzgerald, P.B. (2013). A review of the role of female gender in autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 45(11), 2584–2603. 10.1007/s10803-013-1811-1.
- Kissine, M. (2012). Pragmatics, cognitive flexibility and autism spectrum disorders. *Mind and Language*, 27, 1–28.
- Kissine, M. (2013). *From utterances to speech acts*. Cambridge: Cambridge University Press.
- Kissine, M. (2016). Pragmatics as metacognitive control. *Frontiers in Psychology*, 6, 2057.

- Klecan-Aker, J.S., & Swank, P. (1988). The use of a pragmatic protocol with normal pre-school children. *Journal of Communication Disorders*, 21(1) 85-102.
- Klin A. (2006). Autismo e síndrome de Asperger: uma visão geral [Autism and Asperger syndrome: an overview]. *Revista brasileira de psiquiatria (Sao Paulo, Brazil : 1999)*, 28 Suppl 1, S3–S11. <https://doi.org/10.1590/s1516-44462006000500002>
- Klin, A., Jones, W., Schultz, R., Volkmar, F., & Cohen, D. (2002). Visual fixation patterns during viewing of naturalistic social situations as predictors of social competence in individuals with autism. *Archives of General Psychiatry*, 59(9), 809–816. <https://doi.org/10.1001/archpsyc.59.9.809>
- Klin, A., McPartland, J., & Volkmar, F. R. (2005). Asperger syndrome. In F. R. Volkmar, R. Paul, A. Klin, & D. Cohen (Eds.), *Handbook of autism and pervasive developmental disorders: Diagnosis, development, neurobiology, and behavior* (pp. 88–125). John Wiley & Sons Inc.
- Klin, A., Micheletti, M., Klaiman, C., Shultz, S., Constantino, J. N., & Jones, W. (2020). Affording autism an early brain development re-definition. *Development and Psychopathology*, 32(4), 1175–1189. <https://doi.org/10.1017/S0954579420000802>
- Kong, X., Liu, J., Cetinbas, M., Sadreyev, R., Koh, M., Huang, H., Adeseye, A., He, P., Zhu, J., Russell, H., Hobbie, C., Liu, K., & Onderdonk, A. B. (2019). New and Preliminary Evidence on Altered Oral and Gut Microbiota in Individuals with Autism Spectrum Disorder (ASD): Implications for ASD Diagnosis and Subtyping Based on Microbial Biomarkers. *Nutrients*, 11(9), 2128. <https://doi.org/10.3390/nu11092128>
- Kosmidis, M. H., Vlahou, C. H., Panagiotaki, P., & Kiosseoglou, G. (2004). The verbal fluency task in the Greek population: normative data, and clustering and switching strategies. *Journal of the International Neuropsychological Society: JINS*, 10(2), 164–172. <https://doi.org/10.1017/S1355617704102014>

- Kreiser, N.L., & White, S.W. (2014). ASD in females: Are we overstating the gender difference in diagnosis?. *Clinical Child and Family Psychology Review*, 17(1), 67–84. 10.1007/s10567-013-0148-9. [PubMed: 23836119]
- Kyratzis, A., & Guo, J. (2001). Pre-school girls' and boys' verbal strategies in the United States and China. *Research on Language and Social Interaction*, 34(1), 45–74.
- Lai, D.-C., Tseng, Y.-C., Hou, Y.-M., & Guo, H.-R. (2012). Gender and geographic differences in the prevalence of autism spectrum disorders in children: Analysis of data from the national disability registry of Taiwan. *Research in Developmental Disabilities*, 33(3), 909–915.
- Lai, M.C., Lombardo, M.V., Pasco, G., Ruigrok, A.N.V., Wheelwright, S.J., Sadek, S.A., Baron-Cohen, S. (2011). A behavioral comparison of male and female adults with high functioning autism spectrum conditions. *PLoS ONE*, 6(6), e20835. 10.1371/journal.pone.0020835.
- Lai, M.C., Lombardo, M.V., Ruigrok, A.N., Chakrabarti, B., Auyeung, B., Szatmari, P. (2017). Quantifying and exploring camouflaging in men and women with autism. *Autism*, 21(6), 690–702. 10.1177/1362361316671012 [PubMed: 27899710]
- Landa, R. (2007). Early communication development and intervention for children with autism. *Mental Retardation and Developmental Disabilities Research Reviews*, 13 (2), 16-25.
- Lane, H., Wozniak, J., Matthies, M., Svirsky, M., Perkell, J., O'Connell, M., & Manzella, J. (1997). Changes in sound pressure and fundamental frequency contours following changes in hearing status. *The Journal of the Acoustical Society of America*, 101(4), 2244–2252. <https://doi.org/10.1121/1.418245>
- Leder, S. B., Spitzer, J. B., Milner, P., Flevaris-Phillips, C., Kirchner, J. C., & Richardson, F. (1987). Voice intensity of prospective cochlear implant candidates and normal hearing adult males. *The Laryngoscope*, 97(2), 224–227. <https://doi.org/10.1288/00005537->

- Leech, G. N. (1983). *Principles of Pragmatics*. London: Longman. ISBN: 0582551102.
- Leedy, P. D. (1997). *Practical research: Planning and design* (6<sup>th</sup> Ed). New Jersey: Prentice-Hall.
- Leekam, S. R., Hunnisett, E., & Moore, C. (1998). Targets and cues: Gaze-following in children with autism. *Journal of Child Psychology and Psychiatry*, 39(7), 951–962. <https://doi.org/10.1017/S0021963098003035>
- Levinson, S. C. (1983). *Pragmatics*. Cambridge: Cambridge University Press. ISBN: 0521294142.
- Lezak, M. D., Howieson, D. B., & Loring, D. W. (2004). *Neuropsychological Assessment* (4<sup>th</sup> ed.). New York: Oxford University Press.
- Liu, F., Li, J., Wu, F., Zheng, H., Peng, Q., & Zhou, H. (2019). Altered composition and function of intestinal microbiota in autism spectrum disorders: a systematic review. *Translational psychiatry*, 9(1), 43. <https://doi.org/10.1038/s41398-019-0389-6>
- LoBiondo-Wood, G., & Haber, J. (1998). *Nursing research: Methods, critical appraisal, and utilization*. St. Louis: Mosby.
- Lomranz, J., Shapira, A., Choresh, N., Gilat, Y. (1975). Children's personal space as a function of age and sex. *Dev Psychol*, 5: 541-545.
- Lord, C., Risi, S., & Pickles, A. (2004). Trajectory of Language Development in Autistic Spectrum Disorders. In M. L. Rice & S. F. Warren (Eds.), *Developmental language disorders: From phenotypes to etiologies* (pp. 7–29). Lawrence Erlbaum Associates Publishers.
- Lord, C., Risi, S., Lambrecht, L., Cook, E.H., Leventhal, B.L., DiLavore, P.C., ... Rutter, M. (2000). The autism diagnostic observation schedule—generic: A standard measure of social and communication deficits associated with the spectrum of autism. *Journal of*

*Autism and Developmental Disorders*, 50(3), 205–223.

Lord, C., Rutter, M., & Le Couteur, A. (1994). Autism diagnostic interview-revised: A revised version of a diagnostic interview for caregivers of individuals with possible pervasive developmental disorders. *Journal of Autism and Developmental Disorders*, 24(5), 659–685. [PubMed: 7814313]

Louis, K. O., & Schulte, K. (2011). Defining cluttering: The lowest common denominator. In D. Ward & K. Scaler Scott (Eds.), *Cluttering: Research, intervention and education* (pp. 233–253). Psychology Press.

Loukusa, S., Leinonen, E., Kuusikko, S., Jussila, K., Mattila, M.-L., Ryder, N., et al. (2006). Use of context in pragmatic language comprehension by children with Asperger syndrome or high-functioning autism. *Journal of Autism and Developmental Disorders*, 37(6), 1049–1059.

Loukusa, S., Leinonen, E., Kuusikko, S., Jussila, K., Mattila, M. L., Ryder, N., Ebeling, H., & Moilanen, I. (2007). Use of context in pragmatic language comprehension by children with Asperger syndrome or high-functioning autism. *Journal of autism and developmental disorders*, 37(6), 1049–1059. <https://doi.org/10.1007/s10803-006-0247-2>.

Loveland, K. A., Landry, S. H., Hughes, S. O., Hall, S. K., & McEvoy, R. E. (1988). Speech acts and the pragmatic deficits of autism. *Journal of Speech Language and Hearing Research*, 31(4), 593.

Lovell, G.I. (2006). Justice Excused: The Deployment of Law in Everyday Political Encounters. *Law & Society Review*, 40 (2): 283-324.

MacKay, G., & Shaw, A. (2005). A comparative study of figurative language in children with autistic spectrum disorders. *Child Language Teaching and Therapy*, 20(1), 13–32.

MacMillan, J.H., & Schumacher, S. (2001). *Research in Education. A Conceptual Introduction*

- (5<sup>th</sup> Ed). Longman, Boston.
- Malhi, P., Singhi, P.A. (2014). A retrospective study of toddlers with autism spectrum disorder: Clinical and developmental profile. *Annals of the Indian Academy of Neurology*, 17, 25-9.
- Mandy, W., Chilvers, R., Chowdhury, U., Salter, G., Seigal, A., & Skuse, D. (2012). Sex differences in autism spectrum disorder: Evidence from a large sample of children and adolescents. *Journal of Autism and Developmental Disorders*, 42(7), 1304–1313. 10.1007/s10803-011-1356-0. [PubMed: 21947663]
- Manikandan, S. (2011). Frequency distribution. *Journal of pharmacology & pharmacotherapeutics*, 2(1), 54–56. <https://doi.org/10.4103/0976-500X.77120>
- Marshall, B., Cardon, P., Poddar, A., & Fontenot, R. (2013). Does sample size matter in qualitative research? A review of qualitative interviews in IS research. *Journal of Computer Information Systems*, 54(1), 11-22. <https://doi.org/10.1080/08874417.2013.11645667>
- Marshall, C.& Rossman, G. B. (1989). *Designing qualitative research*. New bury Park, CA: Sage.
- Martin, I., & McDonald, S. (2003). Weak coherence, no theory of mind, or executive dysfunction? Solving the puzzle of pragmatic language disorders. *Brain and language*, 85(3), 451–466. [https://doi.org/10.1016/s0093-934x\(03\)00070-1](https://doi.org/10.1016/s0093-934x(03)00070-1)
- Martin, I., & McDonald, S. (2004). An exploration of causes of non-literal language problems in individuals with Asperger syndrome. *Journal of Autism and Developmental Disorders*, 34(3), 311–328.
- Matelski, L., & Van de Water, J. (2016). Risk factors in autism: Thinking outside the brain. *Journal of autoimmunity*, 67, 1–7. <https://doi.org/10.1016/j.jaut.2015.11.003>
- Matson, J. L., Sevin, J. A., Box, M. L., Francis, K. L., & Sevin, B. M. (1993). An evaluation of

- two methods for increasing self-initiated verbalizations in autistic children. *Journal of Applied Behavior Analysis*, 26, 389-398.
- Matson, M. L., Mahan, S., & Matson, J. L. (2009). Parent training: A review of methods for children with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 3(4), 868–875. <https://doi.org/10.1016/j.rasd.2009.02.003>
- May, T., Brignell, A., & Williams, K. (2020). Autism Spectrum disorder prevalence in children aged 12–13 years from the longitudinal study of Australian children. *Autism Research*, 13, 821–827.
- May, T., Sciberras, E., Brignell, A., & Williams, K. (2017). Autism spectrum disorder: Updated prevalence and comparison of two birth cohorts in a nationally representative Australian sample. *BMJ Open*, 7(5), e015549.
- Mayer, E. A., Knight, R., Mazmanian, S. K., Cryan, J. F., & Tillisch, K. (2014). Gut microbes and the brain: paradigm shift in neuroscience. *The Journal of neuroscience : the official journal of the Society for Neuroscience*, 34(46), 15490–15496. <https://doi.org/10.1523/JNEUROSCI.3299-14.2014>
- McCann, J., & Peppé, S. (2003). Prosody in autism spectrum disorders: A critical review. *International Journal of Language & Communication Disorders*, 38(4), 325–350. <https://doi.org/10.1080/1368282031000154204>
- McClintock, K., Hall, S., & Oliver, C. (2003). Risk markers associated with challenging behaviours in people with intellectual disabilities: A meta-analytic study. *Journal of Intellectual Disability Research*, 47, 405–416.
- McCormick D. A. (1989). GABA as an inhibitory neurotransmitter in human cerebral cortex. *Journal of neurophysiology*, 62(5), 1018–1027. <https://doi.org/10.1152/jn.1989.62.5.1018>
- McDonough, J. & McDonough, S., (1997). *Research Methods for English Language Teachers*.

- London: Arnold.
- McTear, M. (1985). *Children's conversations*. New York, NY: Blackwell.
- McTear, M., & Conti-Ramsden, G. (1992). *Pragmatic disability in children*. London: Whurr.
- Merin, N., Merin, N., Young, G. S., Young, G. S., Ozonoff, S., Ozonoff, S., Rogers, S. J., & Rogers, S. J. (2007). Visual fixation patterns during reciprocal social interaction distinguish a subgroup of 6-month-old infants at-risk for autism from comparison infants. *Journal of Autism and Developmental Disorders*, 37(1), 108–121. <https://doi.org/10.1007/s10803-006-0342-4>
- Merriam, S. (1988). *Case study research in education: A qualitative approach*. San Francisco: Jossey-Bass.
- Merriam, S. (1998). *Qualitative research and case study applications in education* (2<sup>nd</sup> Ed.). San Francisco: Jossey-Bass.
- Merrill, A. (2015). Linking theories to practice: Exploring theory of mind, weak central cohesion, and executive functioning in ASD. *The Reporter E-Newsletter* 20(7), Indiana Resource Center for Autism, Indiana University, Bloomington.
- Miilher, L.P. & Fernandes, F.D.M. (2009). Habilidades pragmáticas, vocabulares e gramaticais em crianças com transtornos do espectro autístico. *Pró-Fono Rev Atual Cient*, 21(3), 309-314.
- Miller, J.F., (1981). *Assessing language production in children*. Baltimore, MD: University Park Press.
- Mody, M. & Belliveau, J.W. (2013). Speech and language impairments in autism: Insights from behavior and neuroimaging. *North American Journal of Medicine & Science*, 5(3), 157–161.
- Mohammad-Rezazadeh, I., Frohlich, J., Loo, S. K., & Jeste, S. S. (2016). Brain connectivity in autism spectrum disorder. *Current opinion in neurology*, 29(2), 137–147.

<https://doi.org/10.1097/WCO.0000000000000301>

- Monini, S., Banci, G., Barbara, M., Argiro, M. T., & Filipo, R. (1997). Clarion cochlear implant: short-term effects on voice parameters. *The American journal of otology*, 18(6), 719–725.
- Morales, D. R., Slattery, J., Evans, S., & Kurz, X. (2018). Antidepressant use during pregnancy and risk of autism spectrum disorder and attention deficit hyperactivity disorder: systematic review of observational studies and methodological considerations. *BMC medicine*, 16(1), 6. <https://doi.org/10.1186/s12916-017-0993-3>
- Mundy, P., & Newell, L. (2007). Attention, joint attention, and social cognition. *Current Directions in Psychological Science*, 16(5), 269–274. <https://doi.org/10.1111/j.1467-8721.2007.00518.x>
- Murdoch, B. E. (1990). *Acquired speech and language disorders: A neuroanatomical and functional neurological approach*. London: Chapman and Hall.
- Murphy, G. L. (1997). Polysemy and the creation of new word meanings. *Creative thought: An investigation of conceptual structures and processes*, 235-265. Washington, DC: American Psychological Association.
- Musolino J., Crain S. and Thornton R. (2000). Navigating negative quantificational space. *Linguistics*, 38 (1),1-32.
- Musolino, J., & Lidz, J. (2006). Why children are not universally successful with quantification. *Linguistics*, 44(4), 817–852. <https://doi.org/10.1515/LING.2006.026>
- Naremore, R.C. (1985). Explorations of language use: Pragmatic mapping in L1 and L2. *Topics in Language Disorders*, 5(4), 66-79.
- Nation, I. S. P. (1990). *Teaching and learning vocabulary*. New York: Newbury House.
- National Institute of Health. (2012, September). *National Institute on Deafness and Other Communication Disorders; Notice of Closed Meetings*. <https://www.nih.gov/about->

[nih/what-we-do/nih-almanac/national-institute-deafness-other-communication-disorders-nidcd](http://nih/what-we-do/nih-almanac/national-institute-deafness-other-communication-disorders-nidcd)

- Nayate, A., Bradshaw, J. L., & Rinehart, N. J. (2005). Autism and Asperger's disorder: Are they movement disorders involving the cerebellum and/or basal ganglia? *Brain Research Bulletin*, *67*, 327–334. <https://doi.org/10.1016/j.brainresbu.2005.07.011>.
- Nevison, C. D. (2014). A comparison of temporal trends in United States autism prevalence to trends in suspected environmental factors. *Environmental Health*, *13*(1), 73.
- Newton, C.R., Chugani, D.C. (2013). The continuing role of ICNA in Africa: how to tackle autism? *Developmental Medicine and Child Neurology*, *55*, 488–489.
- Nickl-Jockschat, T., Habel, U., Michel, T. M., Manning, J., Laird, A. R., Fox, P. T., Schneider, F., & Eickhoff, S. B. (2012). Brain structure anomalies in autism spectrum disorder--a meta-analysis of VBM studies using anatomic likelihood estimation. *Human brain mapping*, *33*(6), 1470–1489. <https://doi.org/10.1002/hbm.21299>
- Ninio, A. & Snow, C. (1999). The development of pragmatics: Learning to use language appropriately. In Bhatia, T. K. & Ritchie, W. C. (Eds.), *Handbook of language acquisition* (pp. 347-383). New York: Academic Press.
- Ninio, A., & Snow, C. (1996). *Pragmatic development*. Boulder, CO: Westview Press.
- Nippold, M. A. (2000). Language development during the adolescent years: Aspects of pragmatics, syntax, and semantics. *Topics in Language Disorders*, *20*(2), 15–28. <https://doi.org/10.1097/00011363-200020020-00004>
- Noveck, I. A. (2001). When children are more logical than adults: Investigations of scalar implicature. *Cognition*, *78* (2), 165-188.
- Noveck, I.A., Bianco, M., & Castry, A. (2001). The costs and benefits of metaphor. *Metaphor & Symbol*, *16* (1&2), 109-121.
- Noveck, I.A., Guelminger, R., Georgieff, N., & Labruyere, N. (2007). What autism can tell us

- about 'Every...not sentences.' *Journal of Semantics*, 24 (1), 73-90.
- Nunan, D. (1992). *Research methods in language learning*. Cambridge: Cambridge University Press.
- Ochs, E., & Schieffelin, B. (1984). Language acquisition and socialization. In R. Shweder & R. Levine (Eds.), *Culture theory: Essays in mind, self and emotion* (pp. 276–320). New York, NY: Cambridge University Press.
- Onwuegbuzie, A. J., & Leech, N. L. (2006). Linking Research Questions to Mixed Methods Data Analysis Procedures. *The Qualitative Report*, 11(3), 474-498. <https://doi.org/10.46743/2160-3715/2006.1663>
- Ozonoff, S. (1997). Components of executive function in autism and other disorders. In J. Russell (Ed.), *Autism as an executive disorder* (pp. 179–211). Oxford University Press.
- Ozonoff, S. (2012). Editorial perspective: Autism spectrum disorders in DSM-5--an historical perspective and the need for change. *Journal of child psychology and psychiatry, and allied disciplines*, 53(10), 1092–1094. <https://doi.org/10.1111/j.1469-7610.2012.02614.x>
- Ozonoff, S., & Miller, J. N. (1996). An exploration of right-hemisphere contributions to the pragmatic impairments of autism. *Brain and Language*, 52, 411–434.
- Ozonoff, S., Pennington, B. F., & Rogers, S. J. (1991). Executive function deficits in high-functioning autistic individuals: Relationship to theory of mind. *Child Psychology & Psychiatry & Allied Disciplines*, 32 (7), 1081–1105.
- Pânișoară, G. (2011). *Psihologiacopilului modern (Psychology of modern child)*. Iași: Polirom.
- Papafragou, A., & Musolino, J. (2003). Scalar implicatures: Experiments at the semantics-pragmatics interface. *Cognition*, 86, 253-282.
- Papafragou, A., & Tantalou, N. (2004). Children's computation of implicatures. *Language Acquisition*, 12, 71-82.

- Paradis, M. (Ed.). (1998). *Pragmatics in Neurogenic Communication Disorders (Special Issue of the Journal of Neurolinguistics Vol. 11, Nos. 1-2)*. Oxford: Elsevier.
- Parola, A., Gabbatore, L., Bosco, F.M., Gara, B.G., Cossa, F.M., Gindri, P. (2016). Assessment of PI in right hemisphere damage. *Journal of Neurolinguistics*, 39, 10-25. <https://doi.org/10.1016/j.jneuroling.2015.12.003>
- Patton, M. Q. (2001). *Qualitative research & evaluation methods*. (3<sup>rd</sup> Ed.). Saint Paul, MN: Sage Publications.
- Paul, R., & Cohen, D. J. (1985). Comprehension of indirect requests in adults with autistic disorders and mental retardation. *Journal of Speech and Hearing Research*, 28(4), 475–479.
- Paul, R., Augustyn, A., Klin, A., & Volkmar, F. R. (2005). Perception and production of prosody by speakers with autism spectrum disorders. *Journal of autism and developmental disorders*, 35(2), 205–220. <https://doi.org/10.1007/s10803-004-1999-1>
- Paul, R., Orlovski, S. M., Marcinko, H. C., & Volkmar, F. (2008). Conversational behaviors in youth with high-functioning ASD and Asperger syndrome. *Journal of Autism and Developmental Disorders*, 39(1), 115–125.
- Pellegrini, A. D., Huberty, P. D., & Jones, I. (1995). The effects of recess timing on children's classroom and playground behavior. *American Educational Research Journal*, 32, 845–864.
- Pellicano, E. (2010). The Development of Core Cognitive Skills in Autism: A 3-Year Prospective Study. *Child Development*, 81 (5), 1400–1416.
- Perkell, J., Lane, H., Svirsky, M., & Webster, J. (1992). Speech of cochlear implant patients: a longitudinal study of vowel production. *The Journal of the Acoustical Society of America*, 91(5), 2961–2978. <https://doi.org/10.1121/1.402932>
- Perkins, M. R. (2007). *Pragmatic impairment*. Cambridge: Cambridge University Press.

- Perkins, M. R. (2010). Pragmatic impairment. In J. S. Damico, N. Müller, & M. J. Ball (Eds.), *The Handbook of language and speech disorders* (pp. 227–246). Chichester: Wiley-Blackwell.
- Perner, J., Frith, U., Leslie, A. M., & Leekam, S. R. (1989). Exploration of the autistic child's theory of mind: Knowledge, belief, and communication. *Child Development*, *60*(3), 689–700. <https://doi.org/10.2307/1130734>
- Phelps-Terasaki, D., & Phelps-Gunn, T. (1992). *Test of pragmatic language*. Hove: Psychological Corporation.
- Phillips, W., Baron-Cohen, S., & Rutter, M. (1992). The role of eye contact in goal detection: Evidence from normal infants and children with autism or mental handicap. *Development and Psychopathology*, *4*(3), 375–383. <https://doi.org/10.1017/S095457940000845>
- Pisula, E., Kawa, R., Szostakiewicz, Ł., Łucka, I., Kawa, M., & Rynkiewicz, A. (2013). Autistic traits in male and female students and individuals with high functioning autism spectrum disorders measured by the polish version of the autism-spectrum quotient. *PLoS ONE*, *8*(9), e75236. [10.1371/journal.pone.0075236](https://doi.org/10.1371/journal.pone.0075236).
- Polit, D.F. & Hungler, B.P. (1999). *Nursing research: principles and methods*. (6<sup>th</sup> Ed.). Philadelphia: J.B. Lippincott.
- Pouscoulous, N., Noveck, I., Politzer, G., & Bastide, A. (2007). Processing costs and implicature development. *Language Acquisition*, *14* (4), 347-375.
- Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a theory of mind? *Behavioral and Brain Sciences*, *1*(4), 515–526. <https://doi.org/10.1017/S0140525X00076512>
- Prizant, B. M., & Duchan, J. F. (1981). The functions of immediate echolalia in autistic children. *The Journal of speech and hearing disorders*, *46*(3), 241–249. <https://doi.org/10.1044/jshd.4603.241>

- Prutting, C. A., & Kirchner, D. M. (1983). Applied pragmatics. In T. M. Gallagher & C. A. Prutting (Eds.), *Pragmatic assessment and intervention issues in language* (pp. 29–64). San Diego, CA: College-Hill Press.
- Prutting, C.A., & Kirchner, D.M. (1987). A clinical appraisal of the pragmatic aspects of language. *Journal of Speech and Hearing Disorders*, 52(1), 105–119.
- Punch, K. (1998). *Introduction to social research: Quantitative and qualitative approaches*. Thousand Oaks, CA: Sage.
- Pyecha, J., (1988). *A Case Study of The Application of Non categorical Special Education in Two States*. Chapel Hill, NC: Research Triangle Institute.
- Ramondo, N., & Milech, D. (1984). The nature and specificity of the language coding deficit in autistic children. *British Journal of Psychology*, 75, 95–103.
- Rampton, B. (1995). *Crossing: Language and ethnicity among adolescents*. London, England: Longham.
- Randall, M., Sciberras, E., Brignell, A., Ihsen, E., Efron, D., Dissanayake, C., & Williams, K. (2016). Autism spectrum disorder: Presentation and prevalence in a nationally representative Australian sample. *The Australian and New Zealand Journal of Psychiatry*, 50(3), 243–253.
- Rapin, I. (1991). Autistic children: Diagnosis and clinical features. *Pediatrics*, 87(1), 751–760.
- Rapin, I., & Allen, D. (1987) Developmental dysphasia and autism in preschool children: Characteristics and shape, in J. Martin, P. Fletcher, P. Grunwell & d. all (eds). *Proceedings of the first international symposium on specific speech and language disorders in children*, (pp. 20–35). London: AFASIC.
- Recanati, F. (2003). *Literal Meaning*. Cambridge: CUP.
- Recanati, F. (2002). Unarticulated constituents. *Linguistics and Philosophy*, 25, 299–345.
- Recanati, F. (2004). *Literal meaning*. Cambridge: Cambridge University Press.

- Renkema, J. (1993). *Discourse Studies*. Amsterdam: John Benjamins.
- Riby, D. M., Riby, D. M., Hancock, P. J. B., & Hancock, P. J. B. (2009). Do Faces capture the attention of individuals with Williams syndrome or autism? Evidence from tracking eye movements. *Journal of Autism and Developmental Disorders*, 39(3), 421–431. <https://doi.org/10.1007/s10803-008-0641-z>
- Rice, M. L., Smolik, F., Perpich, D., Thompson, T., Rytting, N., & Blossom, M. (2010). Mean length of utterance levels in 6-month intervals for children 3 to 9 years with and without language impairments. *J Speech Lang Hear Res*, 53(2), 333-49.
- Ritvo, E. R & Freeman, B. J. (1977). National society for autistic children definition of the syndrome of autism. *Journal of Pediatric Psychology*, 2(4), 146–148.
- Robertson, K., Chamberlain B., & Kasari C. (2003). General education teachers' relationships with included students with autism. *Journal of Autism and Developmental Disorders*, 33(2), 123 – 130.
- Robinson, D.R. (2008), *Language test evaluation: The test of pragmatic language*. [Unpublished manuscript]
- Rodríguez Muñoz, F. J. (2013). Pilot assessment of nonverbal pragmatic ability in people with Asperger syndrome. *Psychology of Language and Communication*, 17(3): 279-294.
- Rogers, G. B., Keating, D. J., Young, R. L., Wong, M. L., Licinio, J., & Wesselingh, S. (2016). From gut dysbiosis to altered brain function and mental illness: mechanisms and pathways. *Molecular psychiatry*, 21(6), 738–748. <https://doi.org/10.1038/mp.2016.50>
- Rosen, N. E., Lord, C., & Volkmar, F. R. (2021). The Diagnosis of Autism: From Kanner to DSM-III to DSM-5 and Beyond. *Journal of autism and developmental disorders*, 51(12), 4253–4270. <https://doi.org/10.1007/s10803-021-04904-1>
- Roth, F.P., & Spekman, N. J. (1984). Assessing the pragmatic abilities of children: Part I. Organizational framework and assessment parameters. *Journal of Speech and Writing*

- Disorders*, 4(9), 12-11.
- Russo, N. M., Skoe, E., Trommer, B., Nicol, T., Zecker, S., Bradlow, A., & Kraus, N. (2008). Deficient brainstem encoding of pitch in children with Autism Spectrum Disorders. *Clinical neurophysiology: official journal of the International Federation of Clinical Neurophysiology*, 119(8), 1720–1731. <https://doi.org/10.1016/j.clinph.2008.01.108>
- Ryder, N., & Leinonen, E. (2003). Use of context in question answering of 3-, 4- and 5-year-old children. *Journal of Psycholinguistic Research*, 32(4), 397–415.
- Rynkiewicz, A., Schuller, B., Marchi, E., Piana, S., Camurri, A., Lassalle, A., & Baron-Cohen, S. (2016). An investigation of the ‘female camouflage effect’ in autism using a computerized ADOS-2 and a test of sex/gender differences. *Molecular Autism*, 7(1). 10.1186/s13229-016-0073-0.
- Saemundsen, E., Magnússon, P., Georgsdóttir, I., Egilsson, E., & Rafnsson, V. (2013). Prevalence of autism spectrum disorders in an Icelandic birth cohort. *BMJ open*, 3(6), e002748. <https://doi.org/10.1136/bmjopen-2013-002748>
- Saldana, J. (2003). *Longitudinal qualitative research: Analyzing change through time*. Walnut Creek, CA: Alta Mira Press.
- Sale, J. E., Lohfeld, L. H., & Brazil, K. (2002). Revisiting the Quantitative-Qualitative Debate: Implications for Mixed-Methods Research. *Quality & quantity*, 36(1), 43–53. <https://doi.org/10.1023/A:1014301607592>
- Sandelowski, M. (1995). Sample size in qualitative research. *Research in Nursing & Health*, 18(2), 179-183. <https://doi.org/10.1002/nur.4770180211>
- Scheffé, H. (1999). *The Analysis of Variance*. New York, NY: Wiley.
- Schegloff, E. A., Jefferson, G., & Sacks, H. (1977). The preference for self-correction in the organization of repair in conversation. *Language*, 53, 361–82.

- Schensul, L., Schensul, J. & LeCompte, D. (1999). *Essential ethnographic methods: observations, interviews, and questionnaires*. Walnut Creek, CA: Alta Mira Press.
- Schieffelin, B., & Ochs, E. (Eds.). (1986). *Language socialization across cultures*. Cambridge, England: Cambridge University Press.
- Schuck, R. K., Flores, R. E., & Fung, L. K. (2019). Brief Report: Sex/Gender Differences in Symptomology and Camouflaging in Adults with Autism Spectrum Disorder. *Journal of autism and developmental disorders*, 49(6), 2597–2604. <https://doi.org/10.1007/s10803-019-03998-y>
- Schultz, R. T. (2005). Developmental deficits in social perception in autism: The role of the amygdala and fusiform face area. *International Journal of Developmental Neuroscience*, 23(2–3), 125–141. <https://doi.org/10.1016/j.ijdevneu.2004.12.012>
- Schumann, C.M., Barnes, C.C., Lord, C., & Courchesne, E. (2009) Amygdala enlargement in toddlers with autism related to severity of social and communication impairments. *Biol Psychiatry*, 66: 942-949. doi:10.1016/j.biopsych.2009.07.007. PubMed: 19726029.
- Senju, A., Southgate, V., Miura, Y., Matsui, T., Hasegawa, T., Tojo, Y., et al. (2010). Absence of spontaneous action anticipation by false belief attribution in children with autism spectrum disorders. *Development and Psychopathology*, 22, 353–360.
- Shahini, G., & Shahamirian, F. (2017). Improving English Speaking Fluency: The Role of Six Factors. *Advances in Language and Literary Studies*, 8(6), 100-104.
- Shultz, S., Vouloumanos, A., & Pelphrey, K. (2012). The superior temporal sulcus differentiates communicative and non-communicative auditory signals. *Journal of Cognitive Neuroscience*, 24, 1224–1232. [https://doi.org/10.1162/jocn\\_a.00208](https://doi.org/10.1162/jocn_a.00208)
- SIL International. (2015, December 3). *Pragmatics*. Retrieved March 6, 2018, from *SIL Glossary of Linguistic Terms website*.
- Sim, J., Saunders, B., Waterfield, J., & Kingstone, T. (2018). Can sample size in qualitative

- research be determined a priori? *International Journal of Social Research Methodology*, 21(5), 619-634. <https://doi.org/10.1080/13645579.2018.1454643>
- Smith, J. A., & Osborn, M. (2003). Interpretative phenomenological analysis. In J. A. Smith (Ed.), *Qualitative psychology: A practical guide to research methods* (pp. 51-80). Thousand Oaks, CA: Sage.
- Smith, M., Segal, J., & Hutman, T. (2019, February 13). Autism Spectrum Disorders. *HelpGuide.org*. <https://www.helpguide.org/articles/autism-learning-disabilities/autism-spectrum-disorders.htm>
- Speer, L. L., Cook, A. E., McMahon, W. M., & Clark, E. (2007). Face processing in children with autism: Effects of stimulus contents and type. *Autism*, 11(3), 265–277. <https://doi.org/10.1177/1362361307076925>
- Sperber, D., & Wilson, D. (1986/1995). *Relevance: Cognition and Communication*. Oxford: Blackwell.
- Sperber, D., & Wilson, D. (2002). Pragmatics, modularity and mindreading. *Mind and Language*, 17, 3–23.
- Stake, R.E. (1995). *The Art of Case Study Research: Perspective in Practice*. London: Sage.
- Stemmer B. (1999). Pragmatics: theoretical and clinical issues. Introduction. *Brain and language*, 68(3), 389–391. <https://doi.org/10.1006/brln.1999.2118>
- Stephenson, L. J., Edwards, S. G., & Bayliss, A. P. (2021). From gaze perception to social cognition: The shared-attention system. *Perspectives on Psychological Science*, 16(3), 553–576. <https://doi.org/10.1177/1745691620953773>
- Strati, F., Cavalieri, D., Albanese, D., De Felice, C., Donati, C., Hayek, J., Jousson, O., Leoncini, S., Renzi, D., Calabrò, A., & De Filippo, C. (2017). New evidences on the altered gut microbiota in autism spectrum disorders. *Microbiome*, 5(1), 24. <https://doi.org/10.1186/s40168-017-0242-1>

- Study.com. (2017, October 15<sup>th</sup>). *Language Fluency: Definition & Promotion Strategies*.  
<https://study.com/academy/lesson/language-fluency-definition-promotion-strategies.html>.
- Study.com. (2022, June 28<sup>th</sup>). *Facial Expressions in Non-verbal Communication*.  
<https://study.com/academy/lesson/facial-expressions-in-nonverbal-communication-importance-lesson-quiz.html>.
- Surian, L., Baron-Cohen, S., & Van der Lely, H. (1996). Are children with autism deaf to Gricean maxims? *Cognitive Neuropsychiatry*, 1(1), 55–71.
- Svirsky, M. A., Lane, H., Perkell, J. S., & Wozniak, J. (1992). Effects of short-term auditory deprivation on speech production in adult cochlear implant users. *The Journal of the Acoustical Society of America*, 92(3), 1284–1300. <https://doi.org/10.1121/1.403923>
- Swartz J.R., Wiggins, J.L., Carrasco, M., Lord, C., Monk, C.S. (2011). Amygdala habituation and prefrontal functional connectivity in youth with autism spectrum disorders. *J Am Acad Child Adolesc Psychiatry*, 52: 84-93. PubMed: 23265636.
- Syriopoulou-Delli, C. K., Agaliotis, I., & Papaefstathiou, E. (2018). Social skills characteristics of students with autism spectrum disorder. *International Journal of Developmental Disabilities*, 64(1), 35–44.
- Tager-Flusberg H, Rogers S, Cooper J, Landa R, Lord C, Paul R, Rice M, Stoel-Gammon C, Wetherby A, Yoder P. (2009). Defining language benchmarks and selecting measures of language development for young children with Autism Spectrum Disorders. *Journal of Speech, Language & Hearing Research*, 52(1), 643–652.
- Tager-Flusberg, H. (1981). On the nature of linguistic functioning in early infantile autism. *Journal of Autism and Developmental Disorders*, 11, 45–56.
- Tager-Flusberg, H. (1989). A psycholinguistic perspective on language development in the autistic child. In G. Dawson (Ed.), *Autism: Nature, diagnosis, and treatment* (pp. 92–

- 115). New York: Guilford.
- Tager-Flusberg, H. (1991). Semantic processing in the free recall of autistic children: Further evidence for a cognitive deficit. *British Journal of Developmental Psychology*, 9(3), 417–430.
- Tager-Flusberg, H., & Anderson, M. (1991). The development of contingent discourse ability in autistic children. *Child Psychology & Psychiatry & Allied Disciplines*, 32(7), 1123–1134. <https://doi.org/10.1111/j.1469-7610.1991.tb00353.x>
- Tanaka, J. W., & Sung, A. (2013). The “Eye Avoidance” Hypothesis of Autism Face Processing. *Journal of Autism and Developmental Disorders*, 46(5), 1538–1552. <https://doi.org/10.1007/s10803-013-1976-7>
- Taylor, S. and Berridge, V. (2006). Medicinal plants and malaria: an historical case study of research at the London School of Hygiene and Tropical Medicine in the twentieth century. *Transactions of The Royal Society of Tropical Medicine and Hygiene*, 100(8): 707-714.
- Tellis, W. M. (1997). Introduction to Case Study. *The Qualitative Report*, 3(2), 1-14.
- Tiede, G. M., & Walton, K. M. (2020). Social endophenotypes in autism spectrum disorder: A scoping review. *Development and Psychopathology*. <https://doi.org/10.1017/S0954579420000577>
- Tillmann, J., Ashwood, K., Absoud, M., Bolte, S., Bonnet-Brilhault, F., Buitelaar, J.K., ... Charman, T. (2018). Evaluating sex and age differences in ADI-R and ADOS scores in a large European multisite sample of individuals with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 48(7), 2490–2505. [10.1007/s10803-018-3510-4](https://doi.org/10.1007/s10803-018-3510-4). [PubMed: 29468576]
- Trevarthen, C. (1979). Instincts for human understanding and for cultural cooperation: Their development in infancy. In M. von Cranach, K. Foppa, W. Lepenies, & D. Ploog (Eds.),

*Human ethology*. Cambridge, England: Cambridge University Press.

Troyer, A. K., Moscovitch, M., Winocur, G., Leach, L., & Freedman, M. (1998). Clustering and switching on verbal fluency tests in Alzheimer's and Parkinson's disease. *Journal of the International Neuropsychological Society: JINS*, 4(2), 137–143. <https://doi.org/10.1017/s1355617798001374>

Turney, S. (2022). *Pearson Correlation Coefficient (r) | Guide & Examples*. Scribbr.

Umesawa, Y., Matsushima, K., Atsumi, T., Kato, T., Fukatsu, R., Wada, M., & Ide, M. (2020). Altered GABA Concentration in Brain Motor Area Is Associated with the Severity of Motor Disabilities in Individuals with Autism Spectrum Disorder. *Journal of autism and developmental disorders*, 50(8), 2710–2722. <https://doi.org/10.1007/s10803-020-04382-x>

Valenza, E., Simion, F., Cassia, V. M., & Umiltà, C. (1996). Face preference at birth. *Journal of Experimental Psychology. Human Perception and Performance*, 22(4), 892–903. <https://doi.org/10.1037/0096-1523.22.4.892>

van Bakel, M. M. E., Delobel-Ayoub, M., Cans, C., Assouline, B., Jouk, P.-S., Raynaud, J.-P., & Arnaud, C. (2015). Low but increasing prevalence of autism spectrum disorders in a French area from register-based data. *Journal of Autism and Developmental Disorders*, 45(10), 3255–3261.

van Balkom, I. D., Bresnahan, M., Vogtländer, M. F., van Hoeken, D., Minderaa, R. B., Susser, E., & Hoek, H. W. (2009). Prevalence of treated autism spectrum disorders in Aruba. *Journal of neurodevelopmental disorders*, 1(3), 197–204. <https://doi.org/10.1007/s11689-009-9011-1>

van Wijngaarden-Cremers, P.J.M., van Eeten, E., Groen, W.B., Van Deurzen, P.A., Oosterling, I.J., & Van der Gaag, R.J. (2014). Gender and age differences in the core triad of impairments in autism spectrum disorders: A systematic review and meta-analysis.

- Journal of Autism and Developmental Disorders*, 44(3), 627–635. 10.1007/s10803-013-1913-9. [PubMed: 23989936]
- van Zaalen, Y., & Reichel, I. K. (2014). Cluttering treatment: Theoretical considerations and intervention planning. *Perspectives on Global Issues in Communication Sciences and Related Disorders*, 4(2), 57–62. <https://doi.org/10.1044/gics4.2.5>
- van Zaalen, Y., Wijnen, F., & De Jonckere, P. H. (2009). Differential diagnostic characteristics between cluttering and stuttering--part one. *Journal of fluency disorders*, 34(3), 137–154. <https://doi.org/10.1016/j.jfludis.2009.07.001>
- Varcin, K. J., & Nelson Charles III, A. (2016). A developmental neuroscience approach to the search for biomarkers in autism spectrum disorder. *Current Opinion in Neurology*, 29(2), 123–129. <https://doi.org/10.1097/WCO.0000000000000298>
- Vaughan Van Hecke, A., Mundy, P. C., Acra, C. F., Block, J. J., Delgado, C. E. F., Parlade, M. V., Meyer, J. A., Neal, A. R., & Pomares, Y. B. (2007). Infant joint attention, temperament, and social competence in preschool children. *Child Development*, 78(1), 53–69. <https://doi.org/10.1111/j.1467-8624.2007.00985.x>
- Vela, G., Stark, P., Socha, M., Sauer, A. K., Hagemeyer, S., & Grabrucker, A. M. (2015). Zinc in gut-brain interaction in autism and neurological disorders. *Neural plasticity*, 2015, 972791. <https://doi.org/10.1155/2015/972791>
- Verschueren, J. (1999). *Understanding pragmatics*. London: Arnold. ISBN: 0340646241.
- Vervloed, M. P. J., van den Broek, E. C. G., & van Eijden, A. J. P. M. (2020). Critical review of setback in development in young children with congenital blindness or visual impairment. *International Journal of Disability, Development, and Education*, 67(3), 336–355. <https://doi.org/10.1080/1034912X.2019.1588231>
- Vicker, B. (2009). *Social communication and language characteristics associated with high functioning, verbal children and adults with autism spectrum disorder*. Bloomington,

IN: Indiana Resource Center for Autism.

- Vieira, J.M., Barbosa, P.A. and Pegoraro-Krook, M.I. (2004) A pausa na produção da fala com comprometimento neurológico [A pause in production of speech in neurologic impairment]. *Revista de Estudos da Linguagem*, 12(2) 181-191.
- Volden, J., Mulcahy, R. F., & Holdgrafer, G. (1997). Pragmatic language disorder and perspective taking in autistic speakers. *Applied Psycholinguistics*, 18(2), 181–198. <https://doi.org/10.1017/S0142716400009966>
- Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes* (M. Cole, Ed.). Cambridge, Massachusetts: Harvard University Press.
- Vygotsky, L. S. (1962). *Thought and language*. Cambridge, MA: MIT Press. doi:10.1037/11193-000
- Wang, L. W., Tancredi, D. J., & Thomas, D. W. (2011). The prevalence of gastrointestinal problems in children across the United States with autism spectrum disorders from families with multiple affected members. *Journal of developmental and behavioral pediatrics: JDBP*, 32(5), 351–360. <https://doi.org/10.1097/DBP.0b013e31821bd06a>
- Wasilewska, J., & Klukowski, M. (2015). Gastrointestinal symptoms and autism spectrum disorder: links and risks - a possible new overlap syndrome. *Pediatric health, medicine and therapeutics*, 6, 153–166. <https://doi.org/10.2147/PHMT.S85717>
- Watson, O.M. (1970). *Proxemic behavior: A cross- cultural study*. The Hague: Mouton.
- Weeks, S. J., & Hobson, R. P. (1987). The salience of facial expression for autistic children. *Journal of Child Psychology and Psychiatry*, 28(1), 137–152. <https://doi.org/10.1111/j.1469-7610.1987.tb00658.x>
- Wells, G. (1985). *Language development in the pre-school years*. Cambridge, England: Cambridge University Press.
- Werling, D.M., & Geschwind, D.H. (2013). Sex differences in autism spectrum disorders.

- Current Opinion in *Neurology*, 26(2), 146–153. 10.1097/WCO.0b013e32835ee548.  
[PubMed: 23406909]
- Westerveld, M. (2019). Language sampling. In J. Damico & M. Ball (Eds.), *The SAGE encyclopedia of human communication sciences and disorders* (pp. 1013-1014). Thousand Oaks, CA: SAGE Publications, Inc. doi: 10.4135/9781483380810.n339
- Wetherby, A. M., & Prutting, C. A. (1984). Profiles of communicative and cognitive-social abilities in autistic children. *Journal of Speech and Hearing Research*, 27, 364–377.
- Whyte, F. (1979). On making the most of participant observation. *The American Sociologist*, 14, 156-166.
- Wiemann, J. (2003). Foreword. In J. Greene & B. Burleson (Eds.) *Handbook of communication and social interaction skills*. Mahwah, NJ: Lawrence Erlbaum.
- Williams, B. L., Hornig, M., Buie, T., Bauman, M. L., Cho Paik, M., Wick, I., Bennett, A., Jabado, O., Hirschberg, D. L., & Lipkin, W. I. (2011). Impaired carbohydrate digestion and transport and mucosal dysbiosis in the intestines of children with autism and gastrointestinal disturbances. *PloS one*, 6(9), e24585.  
<https://doi.org/10.1371/journal.pone.0024585>
- Williams, S. K., Johnson, C., & Sukhodolsky, D. G. (2005). The role of the school psychologist in the inclusive education of school-age children with autism spectrum disorders. *Journal of School Psychology*, 43(2), 117–136. Doi: 10.1016/j.jsp.2005.01.002.
- Wilson, C.E., Murphy, C.M., McAlonan, G., Robertson, D.M., Spain, D., Hayward, H., ... Murphy, D.G. (2016). Does sex influence the diagnostic evaluation of autism spectrum disorder in adults? *Autism*, 20(7), 808–819. 10.1177/1362361315611381. [PubMed: 26802113]
- Wilson, D., & Carston, R. (2007). A unitary approach to lexical pragmatics: relevance, inference and ad hoc concepts. In N. Burton Roberts (ed.), *Advances in Pragmatics*,

- 230-260. Basingstoke: Palgrave.
- Winer, G.A., Cottrell, J.E., Mott, T., Cohen, M., & Fournier, J. (2001). Are children more accurate than adults? Spontaneous use of metaphor by children and adults. *Journal of Psycholinguistic Research*, 30 (5), 485-496.
- Wing L, Potter D (2002). The epidemiology of autistic spectrum disorders: is the prevalence rising? *Mental Retard Dev Disabil Res Rev*, 8, 151.
- World Health Organization (WHO). (1993). *The ICD-10 classification of mental and behavioural disorders*. World Health Organization.
- World Health Organization (WHO). (2013). *Autism spectrum disorders and other developmental disorders: From raising awareness to building capacity*. Geneva, Switzerland: WHO. Retrieved from [http://apps.who.int/iris/bitstream/10665/103312/1/9789241506618\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/103312/1/9789241506618_eng.pdf).
- Yin, R. (1994). *Case study research: Design and methods*. Thousand Oaks, CA: Sage.
- Yin, R. K. (2014). *Case study research: Design and methods* (5<sup>th</sup> Ed.). Thousand Oaks, CA: Sage.
- Yin, R., and Moore, G., (1987). The use of advanced technologies in special education. *Journal of Learning Disabilities*, 20(1), 60.
- Yin, R.K., (1984). *Case Study Research: Design and Methods*. Beverly Hills, Calif: Sage Publications.
- Yirmiya, N., Erel, O., Shaked, M., & Solomonica-Levi, D. (1998). Meta analyses comparing theory of mind abilities of individuals with autism, individuals with mental retardation, and normally developing individuals. *Psychological Bulletin*, 124(3), 283–307.
- Young, E. C., Diehl, J. J., Morris, D., Hyman, S. L., & Bennetto, L. (2005). The use of two language tests to identify pragmatic language problems in children with autism spectrum disorders. *Language, Speech, and Hearing Services in Schools*, 36, 62–72.

Zainal, Z. (2003). *An Investigation into the effects of Discipline-Specific Knowledge, Proficiency and Genre on Reading Comprehension and Strategies of Malaysia ESP Students*. (Unpublished Ph.D. Thesis). University of Reading, Reading, England.

## Appendices

### Appendix 01

#### The Pragmatic Aspects of Language, as Adapted from Prutting and Kirchner (1987)

Name: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Age: \_\_\_\_\_

Gender: \_\_\_\_\_  
 School Attendance: \_\_\_\_\_  
 MLU: \_\_\_\_\_

COMMUNICATIVE ACT	DEFINITION	ALWAYS APPROPRIATE	SOMETIMES APPROPRIATE	ABSENT	NO OPPORTUNITY TO OBSERVE	EXAMPLES/COMMENTS
<b>VERBAL ACTS</b>						
<i>Speech Acts</i>						
• Speech act pair analysis	The ability to take both speaker and listener role appropriate to the context					
• Variety of speech acts	The variety of speech acts or what one can do with language such as comment, assert, request, promise, and so forth					
<i>Topic</i>						
• Selection	The selection of a topic appropriate to the multidimensional aspects of context					
• Introduction	Introduction of a new topic in the discourse					
• Maintenance	Coherent maintenance of topic across the discourse					
• Change	Change of topic in the discourse					
<i>Turn Taking</i>						

• Initiation	Initiation of speech acts					
• Response	Responding as a listener to speech acts					
• Repair / revision	The ability to repair a conversation when a breakdown occurs, and the ability to ask for a repair when misunderstanding or ambiguity has occurred					
<b>COMMUNICATIVE ACT</b>	<b>DEFINITION</b>	<b>ALWAYS APPROPRIATE</b>	<b>SOMETIMES APPROPRIATE</b>	<b>ABSENT</b>	<b>NO OPPORTUNITY TO OBSERVE</b>	<b>EXAMPLES/COMMENTS</b>
<b>VERBAL ACTS</b>						
<b><i>Turn Taking (continued)</i></b>						
• Pause time	Pause time that is too short or too long between words, in response to a question, or between sentences					
• Interruption/ overlap	Interruptions between speaker and listener; overlap refers to two people talking at once					
• Feedback to speakers	Verbal behavior to give the listener feedback such as <i>yeah</i> and <i>really</i> ; nonverbal behavior such as head nods to show positive reactions and side to side to express negative effects or disbelief					
• Adjacency	Utterances that occur immediately after the partner's utterance					
• Contingency	Utterances that share the same topic with a preceding utterance and that add information to the prior communicative act					
• Quantity/ conciseness	The contribution should be as informative as required but not too informative					
<b><i>Lexical Selection/Use Across Speech Acts</i></b>						
• Specificity / accuracy	Lexical items of best fit considering the text					
• Cohesion	The recognizable unity or connectedness of text					
<b><i>Stylistic Variations</i></b>						
• The varying of communicative styles	Adaptations used by the speaker under various dyadic conditions (e.g., polite forms, different syntax, changes in vocal quality)					

COMMUNICATIVE ACT	DEFINITION	ALWAYS APPROPRIATE	SOMETIMES APPROPRIATE	ABSENT	NO OPPORTUNITY TO OBSERVE	EXAMPLES/COMMENTS
<b>PARALINGUISTIC ASPECTS</b>						
<i>Intelligibility and Prosodics</i>						
• Intelligibility	The extent to which the message is understood					
• Vocal intensity	The loudness or softness of the message					
• Vocal quality	The resonance and/or laryngeal characteristics of the vocal tract					
• Prosody	The intonation and stress patterns of the message; variations of loudness, pitch, and duration					
• Fluency	The smoothness, consistency, and rate of the message					
<b>NONVERBAL ASPECTS</b>						
<i>Kenesics and Proxemics</i>						
• Physical proximity	The distance that the speaker and listener sit or stand from one another					
• Physical contacts	The number of times and placement of contacts between speaker and listener					
• Body posture	Forward lean is when the speaker or listener moves away from a 90-degree angle toward the other person; recline is slouching down from waist and moving away from the partner; side to side is when a person moves to the right or left					
• Foot/leg and hand/arm movements	Any movement of the foot/leg or hand/arm (touching self or moving an object or touching part of the body, clothing, or self)					
• Gestures	Any movements that support, complement, or replace verbal behavior					
• Facial expression	A positive expression as in the corners of the mouth turned upward; a negative expression is a downward turn; a neutral expression is the face in resting position					
• Eye gaze	One looks directly at the other's face; mutual gaze is when both members of the dyad look at the other					

## Appendix 02

### Arabic MLU Rulebook (Revised from Dormi & Berman (1982), Pages 410-414)

#### • Noun/Adjective

1. All singular, nonanimate nouns should be counted as "one morpheme" by the researcher: لعبة، علبة، طاولة، ممحاة، مبراة، مقلّمة، كراس، دفتر، باب، حذاء، قلم، كرسي،
2. All feminine animate nouns and all feminine adjectives are considered "two morpheme" words: صديقة، جميلة، لطيفة
3. Nouns/adjectives that can be both singular and plural are considered "two morphemes": طاولات، أبواب، كرسيان، مقلّمتين، صديقات، معلمات،
4. Consider all the following as a single morpheme:
  - Nominal forms that only exist in the plural: نساء، ماء
  - Clearly unanalyzed plural forms: مقص
5. All "formulaic or unsegmented expressions" should be counted as "one morpheme":
  - Proper Nouns: أبو بكر
  - Compound Nouns: خمسة عشر
  - Ritualistic Formulas: عيد الفطر
  - Other expressions: ومبعد

#### • Verb

1. Consider that all imperatives are "one morpheme": خلي (اترك)، أرواح (تعال)، حبس (توقف):

2. Third-person masculine singular tensed forms are counted as "one morpheme," regardless of the tense they are in.: كلا، او يعيط، ضك يجي

3. Using same verbs in a different tense does not get bonus points: راح، ضك يروح، او رايح

Any modification in the tensed forms (vowel infixes/addition of a prefix or suffix) that indicates an alteration in number, gender, or person receives an extra point: راهم يلعبو. جاو.

4. Do not award points as bonuses to the use of a particular verb root based on the 15 patterns: اكتب. انكتب. تكاتب. كتب. كتاب

- **Function Word**

1. Regardless of gender, person, or number, each and every pronoun in the normative should be counted as "one morpheme.": هو.ما. حنا. نتوما

2. Every inflected pronoun should be counted as "two morphemes": عليه، فيه

3. Apply the "one morpheme rule" to all prepositions "في. على. تحت"

4. The following operators are to be considered "one morpheme":

- Demonstrative: هذا. هاذو، لخرين

- Adverb of Time: البارح. اليوم. مبعدا، ضركا

- Question: شكون، وكتاه، وين، كيفاه، لمن، علاش؟

- Quantifier/Numeral: واحد، زوج، بزاف

- Formulaic/Frozen expression: مانعرفش، ماشفتهاش، ماعلاباليش

5. consider the following operators to be "one morpheme" when prefixed to the following word:

- The Definite Article: ال

➤ Conjunction Marker: و

➤ Subordinator: أن

- **Diverse**

1. Instances of lexical repetition are typically counted as a single occurrence, unless a modifier is employed multiple times for the purpose of emphasising a particular point. In such cases, the repetition is regarded to be a distinct instance and is counted accordingly: بزاف بزاف
2. In the realm of linguistic analysis, vocalisations that convey meaning, such as onomatopoeic expressions (e.g., "meow مياو" or "aw عاو"), are considered a singular morpheme.
3. The inclusion of exclamations and fillers, such as "اه", "اها", and "يخي", in linguistic analysis is contingent upon their ability to convey semantic content. In the absence of such content, these elements are not considered in the analysis.
4. The utilisation of diminutive forms, such as "مومو" and "بيبي", is awarded an additional point in cases where they are deemed productive within the given sample. In contrast to the English language, they are endowed with inherent value.

## Appendix 03

### Request to conduct a field study

الجمهورية الجزائرية الديمقراطية الشعبية  
PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA

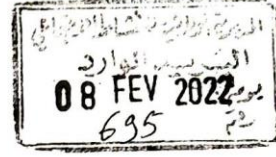
MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH  
UNIVERSITY OF BATNA 2 - MOSTAFA BENBOULAID-  
FACULTY OF ARTS AND FOREIGN LANGUAGES  
DEPARTEMENT OF ENGLISH LANGUAGE AND LITERATURE



وزارة التعليم العالي والبحث العلمي  
جامعة باتنة 2 مصطفى بن بولعيد  
كلية الآداب واللغات الأجنبية  
قسم اللغة والأدب الإنجليزي

مراسلة رقم: 16.../ق ل أ /ك آ ل أ ج ب 2022/2

إلى السيد: مدير دار الأمل والتضامن  
ولاية باتنة

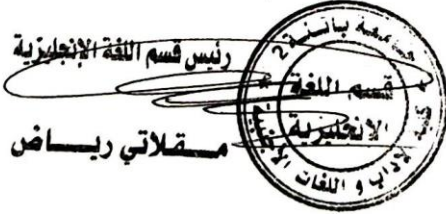


الموضوع: طلب ترخيص لإجراء دراسة ميدانية

يشرفني، أنا الممضي أسفله، رئيس قسم اللغة والأدب الإنجليزي بجامعة باتنة 2 الشهيد مصطفى بن بولعيد أن أتقدم إلى سيادتكم الموقرة بهذا الطلب والمتمثل في منح ترخيص بإجراء دراسة ميدانية في مؤسستكم المحترمة للطالبة راجحي آمنة. أحيطكم علما، سيدي المحترم، أن الطالبة راجحي آمنة أستاذة دائمة بالقسم ومسجلة لتحضير رسالة الدكتوراه. في انتظار ردكم على هذا الطلب، تقبلوا مني سيدي المحترم، أركي عبارات التقدير والاحترام ودمتم في خدمة العلم.

باتنة في: 19 جانفي 2022

رئيس القسم



ABDESSEMED BACHIR

وزارة الخدمات الاجتماعية

ولاية يانعة

دار الأمل والتضامن

جامعة مصطفى بن بولعيد - يانعة 02 -

كلية الآداب واللغات الأجنبية

قسم اللغة الإنجليزية وآدابها

الأستاذة: راجي أمينة

الطه لهنوع، طالب ترحيمي من أجل دراسة بحثية

إلى السيد: رئيس دار الأمل والتضامن

سيفني أن أقدم إلى سيادتكم بطليبي هذا والمتمثل في ترحيمي من أجل

دراسة بحثية (رسالة دكتوراه) حول أطفال التوحد حيث يفتقر الجزء الخامس

حول ملاحظة وتسجيل الأطفال المصابين (صوت وفيديو) دونما احتكاك مباشر

أو تواصل لحيوي.

للإشارة، ستكون السجلات خاصة وليس يتم نشرها عبر أي وسيلة أو

إدعاء لأي هيئة بل ستستغل لغرض بحثي أكاديمي تحت

وتفقدوا مني فائق الاحترام والتقدير.

يرجوا لهذا الطلب بتوقيع ذلك من:

مشرف الأطروحة، البروفيسور د. أواسي تدير



الباحثة، الأستاذة: راجي أمينة



معيدة كلية الآداب واللغات الأجنبية

يانعة، يوم: 2022 / 01 / 19

## Abstract (Arabic)

يبدأ تطور البشر اللغوي وقدراتهم الاجتماعية في مرحلة الطفولة. قد يؤدي اضطراب مراحل النمو الطبيعية إلى إضعاف القدرات المعرفية، مما قد يكون له تداعيات خطيرة على التنشئة الاجتماعية. التحديات المستمرة في التفاعل مع الآخرين، والسلوك المحدود والمتكرر، هي السمات المميزة لاضطراب طيف التوحد. غالبًا ما يظهر في السنوات القليلة الأولى من حياة الشخص (American Psychiatric Association, 2013). يتم عرض اضطراب طيف التوحد من خلال التواصل والتفاعل الاجتماعي غير التقليدي. لذلك، ليس من المستغرب أن يعاني المصابون بالتوحد من صعوبات عملية شديدة. في هذا الصدد، تتمثل الأهداف الأساسية لهذه الدراسة في تعميم نظرية حول عالمية التطور البراغماتي للأطفال المصابين بالتوحد وكذلك العلاقة التنموية بين الجوانب البراغماتية واللغة بشكل عام، مع التركيز على الأطفال المصابين بالتوحد الناطقين بالجزائر. كما يصور الطريقة التي يؤثر بها العمر والجنس والحضور في المدرسة و MLU على مثل هذه المعايير البراغماتية. يوضح كيف يساهم التعليم في تنمية القدرات التواصلية والبراغماتية. تعتمد البيانات التي تم جمعها على البروتوكول العملي الذي صممه (Prutting and Kirchner 1987)؛ أخذ عينات من اللغة العفوية ومراقبتها لمدة حوالي ثمانية أشهر و تم تحليلها كميًا ونوعيًا لمعالجة أسئلة البحث. تظهر النتائج أن أداء المشاركين سيئ في اختبارات الاتصال. أيضًا، تتبع الصعوبات البراغماتية المرتبطة بالتوحد من عوامل معرفية وليست ثقافية. وقد تبين أن التعليم وزيادة MLU يساعدان أطفال التوحد على أن يصبحوا أفضل في استخدام مجموعة متنوعة من المهارات العملية. بالإضافة إلى ذلك، هناك علاقة قوية بين MLU للطفل والتحاقه بالتعليم الرسمي. حصل المشاركون الذين لديهم نمط حضور ثابت في المدرسة على درجات أفضل في MLU.

## **Abstract (French)**

Le développement du langage et des capacités sociales des êtres humains commence dès la petite enfance. La perturbation des phases normales de développement peut entraîner un affaiblissement des capacités cognitives, ce qui peut avoir de graves répercussions sur la socialisation. Les difficultés persistantes d'interaction avec les autres et d'engagement, ainsi que les comportements limités et répétitifs, sont les caractéristiques des troubles du spectre autistique (TSA). Elle apparaît souvent au cours des premières années de la vie d'une personne (American Psychiatric Association, 2013). Le trouble du spectre autistique se manifeste par une communication et une interaction sociale non conventionnelles. Il n'est donc pas étonnant que les personnes autistes aient de graves difficultés pragmatiques. À cet égard, les principaux objectifs de cette étude sont de généraliser une théorie sur l'universalité du développement pragmatique des enfants autistes ainsi que le lien développemental entre les aspects pragmatiques et le langage en général, en se concentrant sur les enfants autistes de langue algérienne. Il décrit également la manière dont l'âge, le sexe, la fréquentation scolaire et le MLU influencent ces paramètres pragmatiques. Il précise comment la scolarisation contribue au développement des capacités communicatives et pragmatiques dans une « étude de cas instrumentale longitudinale ». Les données recueillies dépendaient du Pragmatic Protocol conçu par Prutting et Kirchner (1987) ; échantillonnage et observation du langage spontané qui a pris environ huit mois et a été analysé quantitativement et qualitativement pour répondre aux questions de recherche. Les résultats montrent que les participants ont obtenu de mauvais résultats aux tests de communication. De plus, les difficultés pragmatiques associées à l'autisme découlent de facteurs cognitifs plutôt que culturels. Il a été démontré que la scolarisation et l'augmentation de la MLU aident les enfants TSA à mieux utiliser une variété de compétences pragmatiques. En plus de cela, il existe une corrélation robuste entre le MLU d'un enfant et sa probabilité de s'inscrire dans l'enseignement formel. Les participants ayant un schéma de

fréquentation scolaire constant avaient de meilleurs scores MLU.

