

People's democratic Republic of Algeria

Ministry of higher education and scientific research

Ibn Khaldoun university of Tiaret

Faculty of letters and languages

Department of letters and Foreign languages

Section of English



Examining the cognitive overlap of language impairment
in autism spectrum disorder: A psycho linguistic approach

A dissertation submitted to the department
of foreign languages in partial fulfillment of requirements
for the master's degree in linguistics

Submitted by:

- Mr. Souci Said
- Mr. Louz Djamel

Supervised by:

- Dr. Belaid Louiza

Examination Panel:

- Dr SAHLI Naima
- Dr Boukhelif Naima

Academic year / 2020/2021

Dedication I

I want to thank myself and all my family.



Dedication II

I dedicate this work to my father my soul mate and my inspiration who passed away a few months ago, to my mother the reason of who i am today ; to mysisters thankyou for all your support, and a special thanks to my friend and brother souci saïd for being always there for me.



ACKNOWLEDGEMENTS

We deeply thankfull and gratfull to our supervisor Dr. BELAID Louiza for her guidance, this thesis would not be completed without her time, help and advice.

We wish to acknowledge with gratitude the efforts of the jury members, mainly Dr SAHLI Naima and Dr BOUKHLIF Naima for reading our dissertation and providing with constructive feedback.

Many thanks to all the teachers of Ibn Khaldoun University in the English department.

Our appreciations are sent to all the speech pathologists for their collaboration in completing the questionnaire, and to all the autistic.

Special thanks go to all who helped us in determining this work.

Abstract

This research aims at examining the relationship between language and autism spectrum disorder, the main objectives of this research are to find the causes and the impact autism spectrum disorder has on the language development and behavior of the autistic children, but also on finding solutions to cure or reduce this mental disease. The motivation behind this research is due to the fact that ASD is becoming more common but also to help the autistic children so they can have a chance to live a normal life. A mixed methodology is prepared where qualitative and quantitative methods were used to help in collecting data. Therefore a questionnaire was given to 60 speech pathologists as well as the observation of four autistic children's language and behavior were conducted at the level of the psycho pedagogical center for mentally disabled children in Bou ismail. The results revealed that ASD can be diagnosed at early age. Also, autistic children develop language slowly. Moreover, they have language impairment, communication deficiency and learning disabilities.

Keywords :Autism spectrum disorder, Language impairment, Communication deficiency, Language development, Autistic Children, Learning disabilities, Behaviour.

Acronyms and abbreviations

ASD : Autism Spectrum Disorder

SLI : Specific Language Impairment

DCD :Developmental Coordination Disorder

MBD : Minimal Brain Dysfunction

DAMP : Disorder of Attention and Motor Perception

Liste of Tables

Table 2.1 : speech pathologists age	19
Table 2.2 : speech pathologists university degree.....	20
Table 2.3 : speech pathologists working experience	21
Table 2.4 : reasons behind the speech pathologists occupation choice	22
Table 2.5 : the feelings of our participants towards there occupation	23
Table 2.6 : methods of diagnosing autism spectrum disorder	25
Table 2.7 : gender' asd affection	26
Table 2.8 : descriptive statistics of possible effects of ASD on people	27
Table 2.9 : possibilities of diagnosing ASD at an early age	28

Liste of Graphs

Figure 2.2.1 : speech pathologists university degree	20
Figure 2.3.1 : speech pathologists working experience	21
Figure 2.4.1 : reasons behind the speech pathologists occupation choice	22
Figure 2.6.1 : methods of diagnosing autism spectrum disorder	25
Figure 2.8.1 : statistics of possible consequence of AD on people	27
Figure 2.9.1 : ASD diagnosis	29

Table of content

Dedication I.....	I
Dedication II.....	II
Acknowledgments.....	III
Abstract.....	IV
List of Abbreviations and Acronyms.....	V
List of tables.....	VI
Lists of graphs.....	VII
Table of Content.....	VIII
General Introduction.....	1
CHAPTER ONE : Littérature review and previous studies	
1.1 Introduction.....	4
1.2 Definiton of Autism Spectrum Disorder.....	4
1.3 Definition of Language.....	5
1.4 Language and Commnication in ASD.....	6
1.5 Specific Language Impairment.....	7
1.6 Learning Disabilities.....	9
1.6.1 Dysgraphia.....	11
1.6.2 Dyslexia.....	12
1.6.3 Dyscalculia.....	13
1.6.4 Dyspraxia.....	15
1.7 Conclusion.....	17
CHAPTER TWO : Data Collection and Analysis	
2.1 Introduction.....	19
2.2 Questionnaire.....	19
2.2.1 First Part of the Questionnaire.....	19
2.2.2 Second Part of the Questionnaire.....	23
2.3 Observation.....	30

2.4 Conclusion.....	33
---------------------	----

CHAPTER THREE : Discussion of the Results

3.1 Introduction.....	35
-----------------------	----

3.2 Discussion of the Questionnaire Results.....	35
--	----

3.3 Discussion of the Observation Results.....	37
--	----

3.4 Recommendations and suggestions.....	39
--	----

3.5 Limitation of the study.....	41
----------------------------------	----

3.6 Conclusion.....	42
---------------------	----

General Conclusion.....	44
-------------------------	----

Bibliography.....	47
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Appendices

Résumé

الملخص

General introduction

Autism spectrum disorder is a developmental disability typically manifesting in the first few years of a child and continues throughout his/her adolescence and adulthood, it can cause significant social, communicative, behavioral, and emotional problems which lead the person to become an isolated self and unaware of his surrounding. People with ASD may communicate, interact, behave, and learn in ways that are different from most people. The learning, thinking, and problem abilities of people with ASD are severely challenging as they can have no functional speech nor advanced vocabulary they also may have intellectual disabilities.

Since several studies have been conducted about autism spectrum disorder, the present endeavour tries to answer some research questions that are classified as follow :

- 1- What causes autism spectrum disorder ?
- 2- Can autism spectrum disorder be diagnosed at an early age ?
- 3- How autism spectrum disorder affects the language ?
- 4- Could autism spectrum disorder be cured or reduced ?

To answer the research questions, our hypothesis and suppositions are raised as follow :

- 1- Children who are born to older parents or have siblings with ASD may have ASD.
- 2- There might be some factors that are considered as a red flag for ASD.
- 3- Children with ASD might be slower to develop language skill and understanding
- 4- There might be some psychological and medical intervention to cure or reduce ASD

This research motivation is triggered by the high rate of children who are suffering from autism spectrum disorder, being someone who enjoys loneliness and rejects all form of socialization events and find difficulties to communicate and create bounds with other people, and this aforementioned is considered as an abnormal behaviour because people are eager to

be socialized Therefore, we want to contribute and help those who suffer from ASD so they can have a chance to live a fair and normal life like we all do.

In order to confirm or disconfirm our hypotheses, we used two research tools. A questionnaire addressed to the speech therapists at the level of the psycho pedagogical center for mentally disabled children in Bou-Ismaïl. Additionally, an observation of autistic childrens during their therapy sessions which helped in examining the research problematic.

The current research consists of three chapters, the first chapter provides a review of previous work dealing with ASD impairment, the second chapter is devoted to the research methodology and data collection, finally the third chapter tackles the discussion of the results as well as the limitation and some recommendations that may help the researchers for future research.

The present research tends to study the cognitive overlap of language in autism spectrum disorder; further, it tries to tackle a neuro-biological issue within a psycho-linguistical approach. As this research has for objectives to understand the causes of ASD and how it affect language development and children learning abilities.

Chapter I :
Literature review

1.1 Introduction

Autism spectrum disorder is a lifelong mental disorder characterized by the presence of communicative, social, and behavior issues, which begins in early childhood. It affects all aspects of life. Cognitive and social skills are developmentally delayed compared to others without the disorder. This chapter deals with the literature review and previous studies related to autism spectrum disorder.

1.2 Definition of autism spectrum disorder

Autism is a word that was coined from the greek word autos which means self, it describe a person who is removed form social interaction and will become isolated self as it was reffered to them by the swiss psychitrist eugen bleuler who was the first to introduce this term in 1911. but it wasnt untill 1933 that the first case of autism spectrum disorder was diagnosed by Leo kanner a child named donaled tripllett and was labeled as case 1.

Since the first official case of autism and the observations conducted by Dr Kanner,he stated in 1943 that “this was a neurodevelopmental disorder and that these children have come into the world with an innate inability to form the usual,biologically contact with people.” in which he concluded that the children he examined are born with a brain injury and a mental incapacity that unables them to do the simplest task of interacting with people .

Several years after the first official case of autism many other definitions about autism have been made and all of them agreed with Dr Kanner’s definiton and findings. Autism spectrum disorder was also defind as :

A complex developmental condition that involves persistent challenges in social interaction, speech and nonverbal communication, and restricted repetitive behaviors. The

effects of ASD and the severity of symptoms are different in each person. (American psychiatric association, August,2018.)

And also as :

A complex, lifelong developmental disability that typically appears during early childhood and can impact a person's social skills, communication, relationships, and self-regulation. Autism is defined by a certain set of behaviors and is a "spectrum condition" that affects people differently and to varying degrees. (Autism society, n.d.).

It is clear that autism spectrum disorder has a devastating impact on the social and linguistic level for those who suffer from this disability that will result in forcing them to live an abnormal and challenging life where the simplest and easiest things to do like speaking fluently or playing with other children will be considered as hard and almost impossible to achieve for autistic people.

1.3 Definition of language

As human beings our primary mean of communication is language through it we can have a conversation, exchange idea, argue, express feelings, emotions, give orders, provide directions and pray. or simply say that language is an original sound that is used by human in social situations.

Through out time language became a field of study and attracted many researchers and scholars who dedicated there time and effort to it and made great contributions and findings. Many of them defined it and redefined it based on there own point of view studies and discoveries.

"Language is the inherent capability of the native speakers to understand and form grammatical sentences. A language is a set of finite or infinite sentences, each finite length and constructed out of a finite set of elements." (Chomsky,2000.). this indicate

that sentences as the basis of a language, sentences may be limited or unlimited in numbers and are made up of only limited components.

According to Sapir (1921) “language is a purely human and non instinctive method of communicating ideas, emotions, and desires by means of a system of voluntarily produced symbols. ” (p.07). meaning that Sapir definition expresses that language is mainly concerned with only human beings and constituted a system of sounds produced by them for communication.

Lyons (1991) stated “languages are the principal systems of communication used by particular groups of human beings within the particular society of which they are members. ” (p.33).According to Lyons, languages are the principal systems of communication used by particular groups of human beings within the particular society of which they are members. He also points out that language is the best communicative system of human beings .

Language is the key that unlocks a person mind and feelings to others, like breathing, language is essential to humans life it makes them fit to live in a society and accomplish daily tasks through interaction and communication with each other.

1.4 Language and communication in ASD

Children with ASD are often delayed in linguistic areas such as lexical and syntactic knowledge, phonology and morphology, although these impairments are less prominent than the impairments in the pragmatic aspects of language (Lord and Paul, 1997). The difficulties with language and communication are already present early in life (Landa 2007, Rapin and Dunn, 2003.). However, the pragmatic impairments remain life long whereas the other language related difficulties are no longer manifest in every single child when they mature (Rapin and Dunn, 2003.).

Studies focusing on preschool children with ASD revealed that at this age the preschoolers encounter deficits in the form, content, and use of language. As when they grew older the pragmatics difficulties are the most profound (Rapin and Dunn, 2003.).

Children developing pragmatic competence before the competence in language form, are already able to communicate a long time before they use their first words. However, deficits in language components such as syntax, morphology, and phonology can also affect pragmatic competence (Bara et al. 1999).

Children who have language problems before the age of three are at a very high risk for developing ASD in early childhood (Miniscalco et al. 2006). If language impairments at the age of five persist into adolescence than these early language impairments are predictive for attention and social difficulties in adolescence (Snowling et al. 2006).

Language is the primary tool of communication for all human beings, deficit in production, understanding and making a successful communication with others because of ASD will result in social and academic difficulties for that particular person.

1.5 Specific language impairment

. Language impairment has been defined principally by a discrepancy between the child's language achievement and chronological age expectations provided by norms for the language measures employed in the diagnosis (Bangs, 1968; Cole,1982; Lahey,1988; Lee, 1974).

Specific language impairment SLI is a form of developmental language impairment in which children demonstrate unexpected difficulties with the acquisition of spoken language. There is substantial literature now showing that children with SLI are at considerable risk for social and behavioral problems (Beitchman, Nair, Clegg, and

Ferguson, 1986; Cantwell and Baker, 1987; Paul & Cohen, 1984; Rice, Sell, and Hadley, 1991.) as well as educational difficulties (Catts, 1993; Hall and Tomblin, 1978).

The problems with language can also limit a child's well being. During the pre-school and elementary school years, children with SLI are less likely than typically developing children to be selected as playmate or friends (Fujiki, Brinton, Hart, and Fitzgerald, 1999 ; Fujiki, Brinton, and Todd, 1996 ; Gretner, Rice, and Hadley, 1994.). Teacher also rate children with SLI as less social skilled and more withdrawn or reticent than their classmates (Fujiki, Brinton, Isaacson, and Summers, 2001 ; Fujiki, Brinton, Morgan, and Hart, 1999 ; Fujiki, Spackman, Brinton, and Hall, 2004 ; Hart, Fujiki, Brinton, and Hart, 2004).

Children with SLI themselves report interacting with fewer peers in social activities and being less well accepted socially than typically developing children of the same age (Jerome, Fujiki, Brinton, and James, 2002).

How a child succeeds in learning the language is the core theoretical problem in language acquisition, according to (Pinker, 1984). Unfortunately some children with SLI do not succeed, as adults they still show obvious morpho-syntactic or lexical errors during a conversation, which means that their linguistic knowledge is not on a par with that of typical adults.

It is clear that language impairment in children is a condition that has to do with communication and learning. It represents serious lifelong threats to: social, emotional, educational, and employment outcomes.

1.6 Learning disabilities

Learning disabilities or learning disorder is a wide variety of learning problems, childrens and adults brain with learning disabilities are wired differently which affects how they receive and process informations, they simply see, hear, and understand things differently this can lead to trouble with learning new information and skills.

According to Kemp, Smith, and Segal (November, 2020.). In their online article entitled “Learning disabilities and disorder”. they offered a checklists that is considered as a red flag for learning disorder and it goes as follow :

The signs and symptoms present at the preschool age are :

1. Problems pronouncing words.
2. Trouble finding the right word.
3. Difficulty rhyming.
4. Trouble learning the alphabet, numbers, colors, shapes, or days of the week.
5. Difficulty following directions or learning routines.
6. Difficulty controlling crayons, pencils, and scissors, or coloring within the lines.
7. Trouble with buttons, zippers, snaps, or learning to tie shoes.

The signs and symptomes present from age 5 to age 9 are :

1. Trouble learning the connection between letters and sounds.
2. Unable to blend sounds to make words.
3. Confuses basic words when reading.

4. Slow to learn new skills.
5. Consistently misspells words and makes frequent errors.
6. Trouble learning basic math concepts.
7. Difficulty telling time and remembering sequences.

The signs and symptoms present from age 10 to age 13 :

1. Difficulty with reading comprehension or math skills.
2. Trouble with open-ended test questions and word problems.
3. Dislikes reading and writing; avoids reading aloud.
4. Poor handwriting.
5. Poor organizational skills (bedroom, homework, and desk are messy and disorganized).
6. Trouble following classroom discussions and expressing thoughts aloud.
7. Spells the same word differently in a single document.

In fact learning disabilities are numerous and differ from each other as they are often grouped by school area skill set. Autistic children face are confronted to many learning disabilities which makes their academic education challenging and different. Due to the dysfunction of their brain it affects their cognitive process which is related to reading, writing, listening, speaking, abstract reasoning, long short term memory, and attention.

1.6.1 Dysgraphia

From the greek " dys" meaning " impaired" and " graphia" meaning " making letter froms hand".

According to Chung and Patel (2015.). Dysgraphia is a disorder of writting ability. At it brodest defenition, it can manifest as difficulty writting at any level, including letter illegibility.

Berninger (2008.). Defined dysgraphia primarily as a language processing disorder that excludes the motor component of writing, sometimes called dysorthography or linguistic dysgraphia.

Tseng and Chow (2000.). Stated that dysgraphia is the difficulty which the child experience in coordinating movement to write letters, testing may show subtle deficiencies in fine motor tasks like finger tapping or difference in grip, force, and stamina.

The national center for learning disabilities provides an excellent discussion for dysgraphia warning signs through the years and has provided us with the following characteristics.

First, pre school children may present the following signs :

1. An awkward grip or body position when writing.
2. Tire easily while writing.
3. Avoidance of writing and drawing tasks.
4. Written letters are poorly formed, inversed, reversed or inconsistently spaced.
5. Difficulty staying within margins.

In addition to the above characteristics, the school aged children may show the following :

1. Illegible handwriting.
2. Switching between cursive and print.
3. Difficulty with word-finding sentence completion, and written comprehension.

Finally, the teenager and young adult with dysgraphia may also present :

1. Difficulty with written organization of thoughts.
2. Difficulty with written syntax and written grammar that is not duplicated with oral tasks.

1.6.2 Dyslexia

Dyslexia is a reading disability caused by a condition in the brain the word originated from the Greek language "dys" which means "abnormal" and "lexia" which means "word", the term was coined in 1883 by Rudolf Berlin.

Dyslexia is a generic term that has come to refer to extraordinary difficulty experienced by otherwise normal children in learning to identify printed words, presumably as the results of constitutional deficiencies. The condition is commonly believed to originate in the visual-spatial system its presence is considered to be signalled by mirror writing and letter reversal. (Vellutino, 1987).

Dyslexia is defined as a disorder that affects literacy and language skills, it is present at birth, it is life long, it is characterized by a number of neurocognitive difficulties and it is resistant to conventional training (The British Dyslexia Association, 2007). Also, it is seen in all ranges of intellectual capacities, and it is characterized by multiple domains of impairment (Pennington and Bishop, 2009).

Frith stated that dyslexia can be analysed at a biological, a cognitive and a symptomatic level, which are all influenced by the environmental level (Frith, 1995). He also characterized the cognitive level as the bridge between the symptomatic and the biological levels, and defines dyslexia as an impairment of neurocognitive origin (Frith, 1999).

According to Bishop and Snowling (2004), the common characteristics of dyslexia are :

1. Memory difficulties.
2. Organisational difficulties.
3. Writing and reading difficulties.
4. Time management difficulties.

According to Cunningham (2011). The most common signs and symptoms for dyslexia are :

1. difficulties or delays in learning the alphabet.
2. Difficulties in learning speaking, reading and spelling.
3. recognizing the order of letters in a word.
4. pronunciation.
5. copying words from another source or discerning the sound of one word from another.

According to Burden (2005). Children with dyslexia may also have problems distinguishing left from right and eye-hand coordination.

1.6.3 Dyscalculia

Dyscalculia is a learning disability related to mathematics, it was first discovered by a Swedish neurologist Salomon Henschen in 1919 who found out that it was possible for a person with high intelligence to have impaired mathematical abilities. The word originates

from both Greek and Latin, "dys" comes from Greek and means "badly", as for "calculia" it is Latin from "calcular" which means "to count".

Dyscalculia or math learning disorder has been defined as current academic skills in math well below the average range in culturally and linguistically appropriate tests, not be better explained by developmental, neurological, sensory or motor disorder and significantly interfering with academic achievement, occupational performance or activities of daily living. Children with dyscalculia can have difficulty with learning to count and understanding the one to one correspondence between numbers and objects, estimating numbers and quantities, telling time, doing mental math and learning mental math concepts. (Soares and Patel, 2015.).

Dyscalculia, also known as developmental dyscalculia is a specific and persistent learning disability that affects the development and performance of arithmetic skills (Kucian and Von Aster, 2015.).

According to Haberstroh, Schulte-Körne (2019), and Bird (2017). They classified the following as signs and symptoms of dyscalculia :

1. Difficulties with processing numbers and quantities, including:
 - Connecting a number to the quantity it represents (the number 2 to two apples).
 - Counting, backwards and forwards.
 - Comparing two amounts.
2. Trouble with subitizing (recognize quantities without counting).
3. Trouble recalling basic math facts (like multiplication tables).
4. Difficulty linking numbers and symbols to amounts.

5. Trouble with mental math and problem-solving.
6. Difficulty making sense of money and estimating quantities.
7. Difficulty with telling time on an analogue clock.
8. Poor visual and spatial orientation.
9. Difficulty immediately sorting out direction (right from left).
10. Troubles with recognizing patterns and sequencing numbers.

1.6.4 Dyspraxia

The term dyspraxia is from the Greek word "dyspraxia". "Praxis" means "to act" and "dys" means "abnormal". So the literal meaning of dyspraxia is abnormal act.

Dyspraxia has been defined as a breakdown of praxis (action) and “the inability to utilise voluntary motor abilities effectively in all aspects of life from play to structured skilled tasks” (Chu S and Milloy n.d, as cited in Bowens and Smith, 1999.). Another, psychology-based definition “motor difficulties caused by perceptual problems, especially visual-motor and kinaesthetic motor difficulties”. (Portwood, 1996.).

Dyspraxic children are those, who in the absence of physical and/or neurological disorder, have difficulties in control and coordination of voluntary motor activity. The condition is developmental rather than acquired. (Brown n.d, cited in Bowens and Smith 1999.).

Dyspraxia most commonly diagnosed as a developmental coordination disorder (DCD), is generally considered within the medical and psychological community to be a difficulty or impairment. People with dyspraxia show a combination of executive dyspraxia or ideomotor and ideational or planning dyspraxia. Executive dyspraxia or ideomotor will affect the fluency

and speed of motor activities as for ideational or planning dyspraxia will affect the planning and coordination. In other word what is considered as a normal ability will prove to be difficult because children's functional abilities may be interpreted differently by their peers and school expectations but also depending on their family background, culture and expectations.

Dyspraxia has been compounded with many other terminologies to describe people with coordination difficulties, the most commun terms used are :

1. clumsiness or the clumsy child syndrome.
2. minimal brain dysfunction (MBD).
3. developmental apraxia.
4. perceptuomotor dysfunction.
5. motor learning difficulty.
6. sensory integration disorder.
7. disorder of attention and motor perception (DAMP).
8. developmental coordination disorder (DCD).

The american psychiatric association consider that dyspraxia should be diagnosed only if the following four signs are present :

1. Motor coordination during daily activities should be substantially below that expected for age and intelligence.
2. Resulting motor difficulties interfere with academic achievement or activities of daily living.

3. The coordination problems are not due to a general medical condition (eg, cerebral palsy or muscular dystrophy) or a pervasive developmental disorder.
4. If mental retardation is present, the motor difficulties are in excess of those usually associated with mental retardation.

1.7 Conclusion

This chapter provided an overview of autism spectrum disorder and its origin as well as some definitions of language and its relation with autism spectrum disorder, also this chapter dealt with previous studies conducted on specific language impairment and learning disabilities. Therefore, the second chapter will be the gate towards our analysis of the presence of language impairment among Autism Spectrum Disorder children.

Chapter II :
Data collection and
analysis

2.1 Introduction :

This chapter is dedicated to the methodological part of our research, we are going to explain the tools used and the approaches that has been taken in our investigation. Our study was done at the level of the psycho pedagogical center for mentally disabled children in Bouismail- Algeria. where we observe hundred of children who suffers from autism spectrum disorder, and conducted a questionnaire with their speech pathologist

2.2 Questionnaire

Our questionnaire was distributed to 60 speech pathologist who took some of their time and kindly accepted to answer it fully.

Our questionnaire is composed of three parts, the first part is composed of 5 questions about some personnel information on the speech pathologists to know about their degrees, working experience and the interest they give to their jobs. The second part is composed of 7 questions about autism spectrum disorder and about their previous experience with this mental disability.

2.2.1 Part One / Participants Demographic Information

Question 1 : How old are you ?

Age	Number	Percentage
From 20 to 25	0	0%
From 26 to 35	15	25%
From 36 to 45	24	40%
Above 45	21	35%
Total	60	100%

Table 2.1 Speech Pathologist Age

As shown in the table 2.1 the majority of the speech pathologists whom answered our questionnaire are aged between 36 to 45 years old in which they represent 40% of our whole respondent, followed by 35% who are above 45 years old, at the third place we have 25% of our speech pathologist whom are between 26 to 35 years old, and finally we have no respondent which age are from 20 to 25 years old.

Question 2 : What is your educational degree?

Objective : The aim behind this question is to know how well our respondents are educated and how far they went in their academic education in order to know how much the information they provided us with are reliable and how much they are knowledgeable about our topic.

University degree	Number	Percentage
Licence degree	9	15%
Master degree	27	45%
Doctorate degree	24	40%
Total	60	100%

Table 2.2 Speech Pathologist University Degree

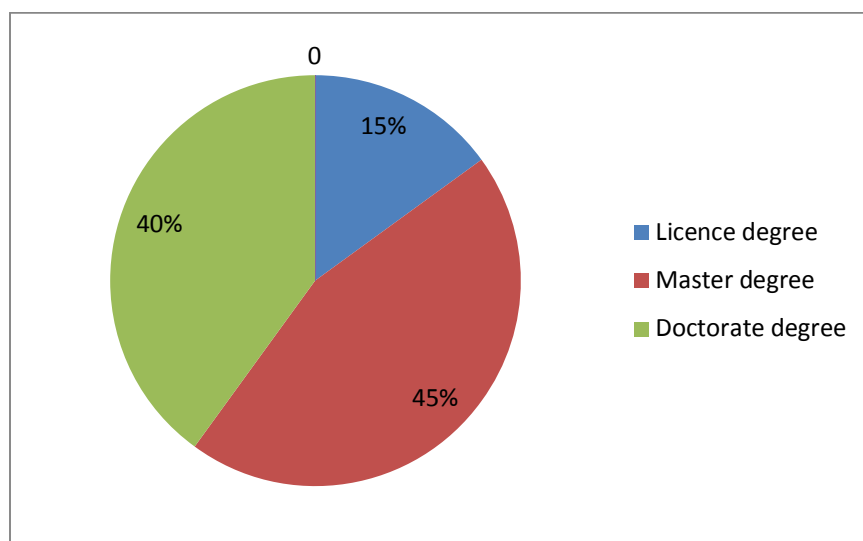


Figure 2.2 .1 Speech Pathologist University Degree

As shown in the table 2.2 and the figure 2.2.1, The speech have knowledge about the subject and are familiar with it, 45% of them have a master degree in speech pathology which give us a number of 27 out of 60 participants. 40% of them have a doctorate degree in speech pathology which represents a number of 24 out of 60 participants. Finally, among the participants, we have speech pathologists with a licence degree with a percentage of 15% that gives us a number of 9 out of 60 participants.

Question 3 : How many years have you been working as a speech therapist ?

Objective : The aim behind this question is to know for how long they have been working as speech pathologists.

Working experience	Number	Percentage
From 5 to 10 years	6	10%
From 10 to 20 years	30	50%
From 20 to 25 years	24	40%
Total	60	100%

Table 2.3 Speech Pathologists Working Experience

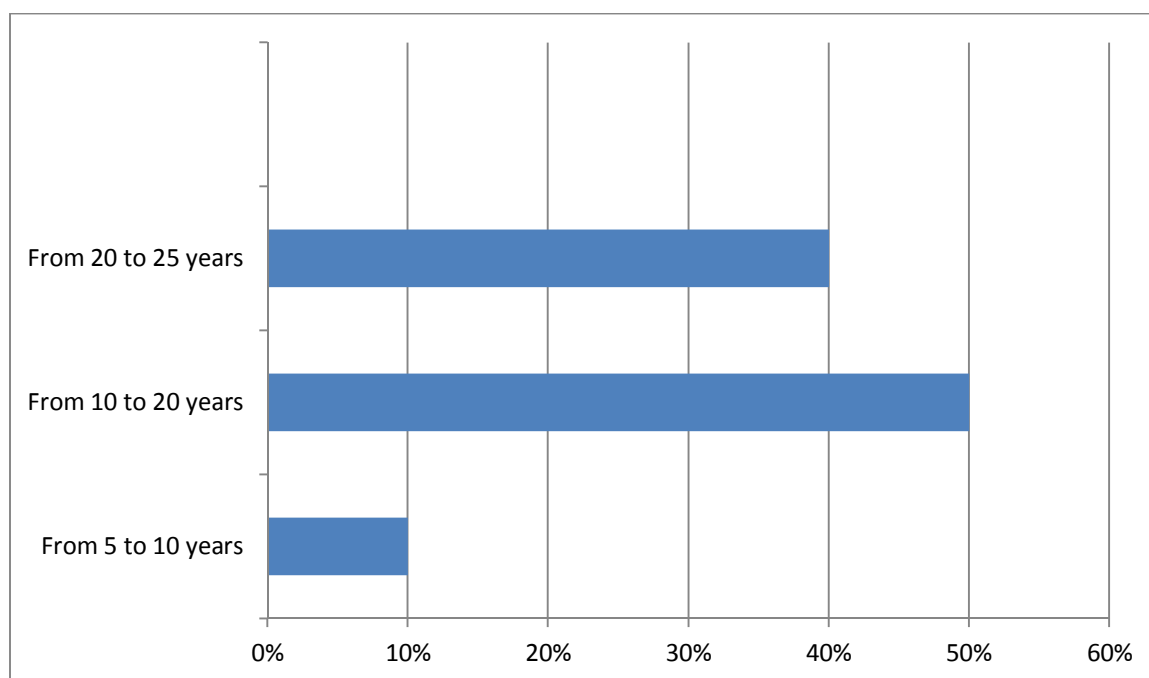


Figure 2.3.1 Speech Pathologists Working Experience

It is essential to know how many years our participants have been working in a field because experience would pave the way to encounter many cases. Their answers are based on their own experience and what they learned and observed and how they dealt with it. As mentioned in the table 2.3 and the figure 2.3.1 above, 50% of our participants work experience is between 10 to 20 years which gives us a number of 30 out of 60 participants, then we have 40% of our participants whose work experience is between 20 to 25 years which gives us a number of 24 out of 60 participants. Finally we have 10% that their work experience is between 5 to 10 years which gives us the number of 6 out of our 60 speech pathologists.

Question 4 : Why did you choose this occupation in particular ?

Objective : The aim of this question is to know why and what drove our participants to choose to work as a speech pathologist.

Options	Number	Percentage
It is challenging	60	100%
I have no other choices	0	0%
Total	60	100%

Table 2.4 Reasons Behind The Speech Pathologists Occupation Choice

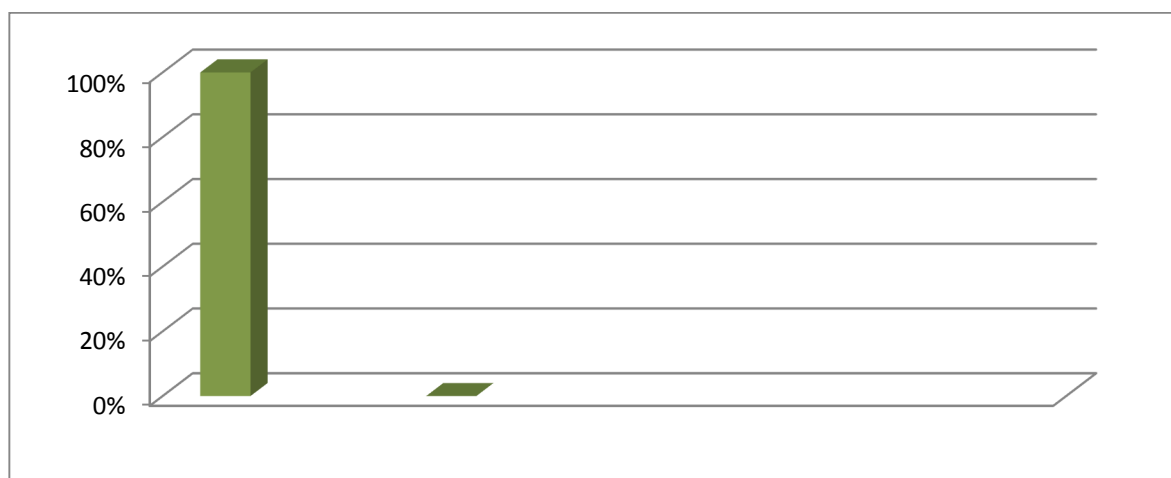


Figure 2.4.1 Reasons Behind Speech Pathologists Occupation Choice

As shown in the table 2.4 and the figure 2.4.1 all of our 60 respondent choose to work as a speech pathologist because it is challenging, none of them were obliged to choose this occupation because they had no other choices. It is essential that you choose your own occupation and what you want to do in life, especially when your occupation is treating mentally disabled people.

Question5 : Do you love this occupation ?

Objective : The aim behind this question is to see if our respondents love thier jobs and are invested in it.

Options	Number	Percentage
Yes i love my occupation	60	100%
No i dont love my occupation	0	0%
Total	60	100%

Table 2.5 The Participants' Attitudes Towards There Occupation

All of our participants as shown in the table 2.5 and the figure 2.5.1 love their occupation and are devoted to it, all of our 60 speech pathologist whom answered our questionnaire replied positively to our question with a percentage of 100%, which makes it easier for them to work and make further research in their field because when you love your line of work you dont feel like you are working you are just doing something you love.

2.2.2 Second part of the questionnaire :

Question 1 : When and how was your first contact with autism spectrum disorder, please share your experience with us ?

Objective : The aim behind this question is to know what did the speech pathologists observed and what did they notice in their first contact with autism spectrum disorder, and when exactly did this first contact happened in their carrier.

This question is typically designed to serve as the first remarks about autism spectrum disorder and what makes it obvious that this person suffers from it, and when did this first contact occur. All the respondents agreed that this was a neurological disability, and that their first contact with autism spectrum disorder patients was very messy and they all have observed a chaotic behavior and a hyperactivity within those patients, in addition of the chaotic behavior they observed a deficiency in communication, a deficiency in language contact, a deficiency in social contacts, they also responded that their first contact with autism spectrum disorder was during there apprenticeship some said that it was 5 years ago some other said that it was a decade ago and other respondent by saying that it was more than 20 years ago.

Question2 : How did you deal with your first autism spectrum disorder patient, please share your experience with us ?

Objective : The aim of this question is to investigate the ways and techniques used by our respondents to deal and communicate with an autism spectrum disorder patient since they suffer from communicative problems and hyperactivity.

This question was designed to know and to be familiar with the steps and the ways our respondents proceeded in dealing with their first spectrum disorder patient. We observed that our respondents used two different methods in dealing with their first spectrum disorder patient. Out of 60 respondents, 70% of respondents claim that in their first contact with an autistic patient they were strict and sever and punished them if they did not follow directives, they were not tolerant with them they showed them no compassion and nor any emotional

behavior. On the other hand 30 % of which gives us a number of 18 respondent out of our 60 responded by saying that they used a more soft approach by giving them strong hugs, they rewarded them for good behaviors which is known as social skills training, they also never grounded them and forced them smoothly and softly to get a sensory contact using there five senses with sensory contact training.

Question 3 : How do you diagnose autism spectrum disorder ?

Objective : The aim behind this question is to know by which mean our respondents are able to find out that the persone they are dealing with has autism spectrum disorder.

Options	Number	Percentage
Biological (blood test)	0	0%
Genetics (karyotype)	0	0%
Clinical (observation of absence or presence of certain behaviours)	60	100%
Total	60	100%

Table 2.6 Methods Of Diagnosing Autism Spectrum Disorder

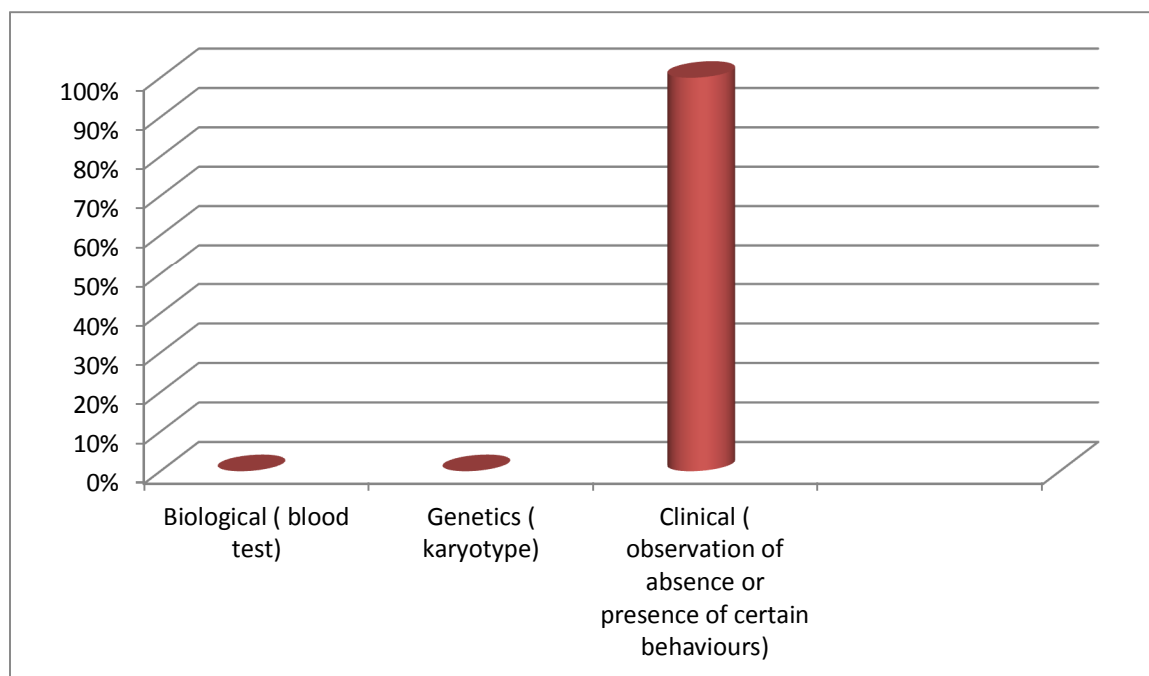


Figure 2.6.1 Methods Of Diagnosing Autism Spectrum Disorder

As clarified in table 2.6 and figure 2.6.1 regarding the methods used to diagnose autism spectrum disorder, 100% of our respondents give us a number of 60 speech pathologists whom answered our questionnaire stated that the only method used is clinical which means observation of the absence or presence of certain behavior in the patients because today autism spectrum disorder is the only mental disability that can not be medically diagnosed and its causes are completely unknown.

Question 4 : Autism spectrum disorder is more common for boys or girls ?

Objective : The aim behind this question is to know which of the two sexes is more likely to be diagnosed with autism spectrum disorder.

Options	Number	Percentage
Boys	60	100%
Girls	0	0%
Total	60	100%

Table 2.7 Genders' ASD Affection

As shown in table 2.7 our 60 respondents replied by boys which give us a percentage of 100% since their first day as speech pathologists they dealt and saw more boys who suffer from autism spectrum disorder than girls, concluding that the boys are more exposed to be diagnosed with autism spectrum disorder than girls. The reasons behind ASD being more common for boys than girls is unknown.

Question 5 : Please answer the following likert items, tick the frequency that you see appropriate for each statement.

Objective : The aim behind those questions is to see how often some possible autism effects are present in people.

Statement / Frequency	Never	Rarely	Sometimes	Always
People with autism spectrum disorder have oral language delays	0%	40%	30%	30%
People with autism spectrum disorder have an intellectual disability	50%	50%	0%	0%
People with autism spectrum disorder have difficulties in communication	0%	0%	0%	0%
People with autism spectrum disorder have difficulties in social contact	0%	0%	0%	100%
People with autism spectrum disorder avoid eye contact	0%	0%	0%	100%
People with autism spectrum disorder adapt to change and grasp new things	40%	20%	10%	30%

Table 2.8 Descriptive Statistics of Possible Effects of Autism Spectrum Disorder on People.

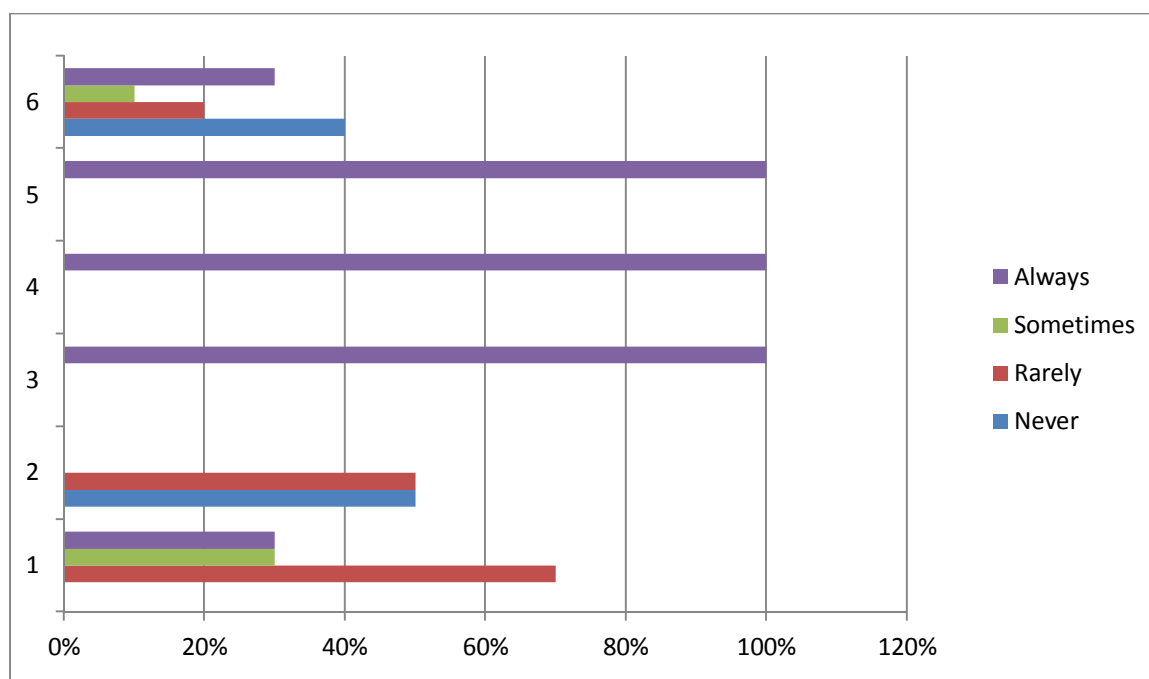


Figure 2.8.1 Statistics of Possible Consequence of Autism Spectrum Disorder on People

As clarified in table 2.8 and figure 2.8.1 most of our participants 70% states that people with autism spectrum disorder rarely have oral language delays as for the other 30% they responded by sometimes. Second of all, 50% of our participants revealed that people with autism spectrum disorder rarely have an intellectual disability as for the other 50% they state

that they never have an intellectual disability, Third, all of our participants agreed with a percentage of 100% assist that people with autism spectrum disorder have always faced difficulties in communication. Fourth, 100% of participants state that people with autism spectrum disorder have always faced difficulties in social contact. Five, our speech pathologists all agreed with a 100% percentage that people with autism spectrum disorder always avoid eye contact. Finally, in the last statement 40% of our respondents stated that people with autism spectrum disorder never adapt to change and grasp new things, as 20% of respondents argue that people with autism spectrum disorder rarely adapt to change and grasp new things, 10% answers by stating that people with autism spectrum disorder sometimes adapt to change and grasp new things, and for the last 30% of our participants replied by saying that people with autism spectrum disorder are always open to change.

Question 6 : Could autism spectrum disorder be diagnosed at an early age ? if yes, how so ?

Objective : The aim behind this question is to know if ASD can be diagnosed at an early age and how can the speech pathologists diagnose it

Options	Number	Percentage
Yes	60	100%
No	0	0%
Total	60	100%

Table 2.9 Possibilities of Diagnosing ASD at an Early Age

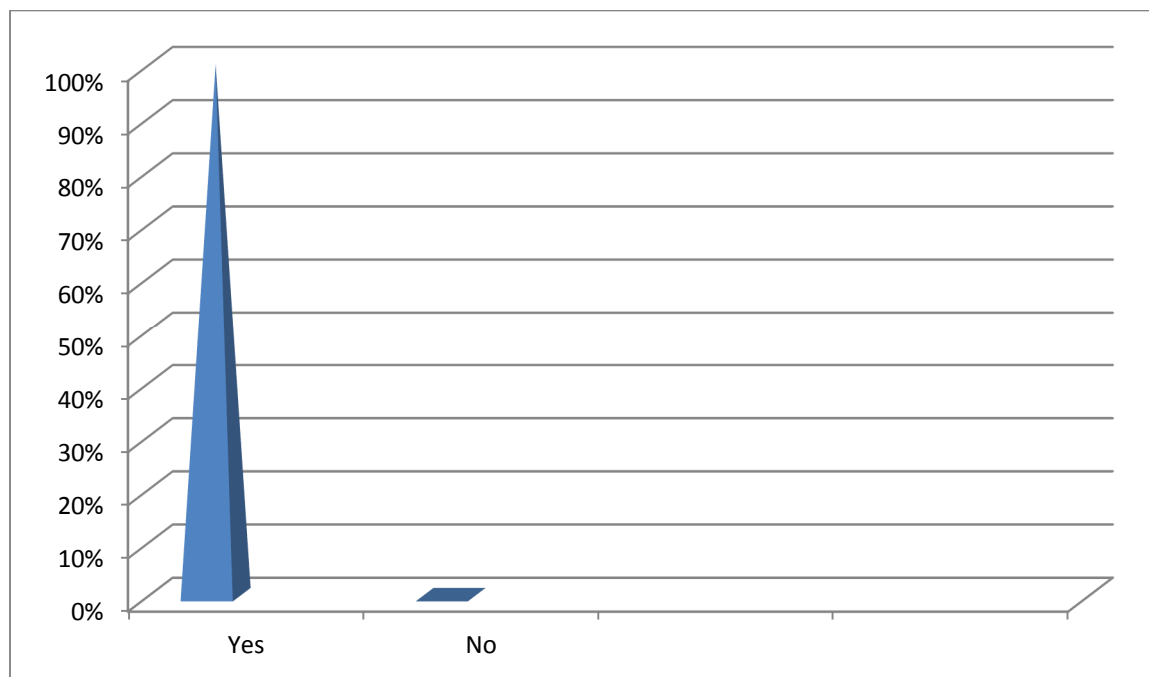


Figure 2.9.1 ASD Diagnosis

As shown in the table 2.9 and figure 2.9.1 all of our participants responds positively that autism spectrum disorder can be diagnosed at an early age , they also statethat there are multiple signs that helps them identify the presence of autism spectrum disorder symptoms at an early age, our respondents state that if the child talks or babbles in a voice with an unusual tone or display unusual sensory contact, body communication, restricted or repetitive behaviors like follows the same routine and repeats words or phrases over and over and does not respond to his name by 9 months of age, it delays cognitive or learning skills.

Question 7 : What difficulties autism spectrum disorder patients could face in learning and acquiring languages ?

Objective : The aim behind this question is to know and to be familiar with the barriers that autism spectrum disorder patients encounter when learning and acquiring a language.

Our respondents state that patients with autism spectrum disorder have language issue especially when acquiring one, they find it hard to pay attention to their teachers, and have

focus issues, because of the damage they have at the level of the Brocas and Wernicerk areas they don't develop and acquire language the same as other normal people do, thus their development is slower, but one of the biggest difficulties that those patients are facing as stated by many of our participants is the integration within a school context for normal people is the greatest challenge that autism spectrum disorder patients can face since they are not like others, they need much more attention, time and effort.

2.3 Observation :

Observation, as a data collection tool, it provides researchers with an insight that ables them to collect data by themselves according to what they see and hear, We have attended multiple speech therapy session and reviewed some of the patients files in order to know more about there background. Our observation was conducted at the level of the psycho pedagogical center for mentally disabled children in Bouismail- Algeria , for a month in sessions that lasted 30 minutes per patient we were able to draw a table of what was observed and the interpretations that are related to our research interest.

Observation	Interpretation
<p>Case 1 : The child is 6 years old he is not receptive to non verbal language and hardly responses to verbal language he did not want to leave his parents side he started crying yelling and got violent. when spoken to they had to repeat what they have just said for 2 or 3 time and the child answer was just by mmm, no or by shaking his head left and right, since the only solution to keep him calm was for his parents to stay with</p>	<p>The child has language his repertoire is very limited for a child of his age, he has also behavior issues, the reason behind him been diagnosed with ASD are unknown, his parents are young, they are not related and they are in a good health and he has no other relatives with ASD, his father is 35 years old and his mother is 30 years old he has an older sister whom she is in a good health and does not suffer from ASD, the speech pathologist offered him to color pictures to see</p>

<p>him, the communication that was established was low since the child was not much of a talker and in order to keep him busy the speech pathologist offered him a coloring book and colored pencils and started to interact with him through this activity .</p>	<p>if he is naturally violent or just that he did not want to stay without his parents by observing the way he colors those pictures he also did it to establish communication, create a bond and gain his trust through this activity that the child loves.</p>
<p>Case 2 : The child is 9 years old he is been treated from the age of 4 years old, he is receptive and produces good oral language, his reading and writing skills are slowly improving he is very sensitive and a loner and has focus issues, loves watching TV, he plays with toys and interacts and speaks to them normally but needs help when it comes to educational toys, on the other hand his interaction with people is limited he does not speak much although he produces correct and understandable sentences.</p>	<p>The child has a good speaking skill but lacks of reading and writing skills, been treated at a young age was helpful in term of his oral language development, his calm behavior and watching TV are of a great help in his oral language development but the lack of focus makes his learning slower than it should be. His parents are not related to each other and they are in a good health, his father is 39 years old and his mother is 37 years old, he has one older brother and one younger sister they do not suffer from ASD nor have any symptoms related to it and they have no relatives that suffers from ASD.</p>
<p>Case 3 : The child is 7 years old he is not receptive to any sort of language either verbal or non verbal, he does not produce any oral language his only way of communicating is by yelling and crying, he does not master any of the four skills of language, he is very violent and hard to control, he is more like a walking baby, he has an empty</p>	<p>The child suffers from a sever ASD that was not taking into consideration by his parent until he was 7 years old, this child mind is like a new born baby's mind he has no productive nor receptive language, because he was not treated at young age his condition got worse than it was and he did not develop any language his mind is stuck and did not develop since he was at best</p>

<p>verbal repertoire and a blank mind the absence of the signified and signifier is very clear, he produces sound that have no meaning like gaga, grrrr and moaning.</p>	<p>1 year old, he has no brothers nor sisters, his father is 32 years old and his mother is 29 years old both of them are in a good health and they are not related to each other and have no relatives that suffers from ASD.</p>
<p>Case 4 : The child is 4 years old he is receptive to both verbal and non verbal language, he swallows words and have problems in articulation and pronunciation, his listening is good but has difficulties in writing, his behavior is unpredictable his mood can change quickly and without warning, he can stay quiet for a bit then suddenly starts screaming, jumping and running, in order to control his behavior the speech pathologist hold his hands and makes direct eye contact in order to control him if any sudden behavioral change occurs.</p>	<p>The child has oral language production problems his grammatical and phonetic structures are damaged he does not produce correct sentence and swallow words and substitutes them with other words that give no meaning to what he wants to say, his behavior is very unpredictable he can stay calm and within seconds his attitude can shift, the speech pathologist uses the direct eye contact technique and holds his hand to control him and to lower his temper in case the child mood changes, the child has a twin he is in a good health and does not suffer from ASD, his father is 40 years old and his mother is 36 years old and they are both in a good health and they are not related to each other and have no relatives that suffers from ASD.</p>

2.4 Conclusion :

In this chapter, we have counted on two research instruments to collect data, the questionnaire and the observation were very helpful because each research tool has its own advantages and disadvantages, we have analysed our questionnaire and we have provided statistics and graphs for the questions and interpretations for the open ended questions as for the likert scale we have counted our speech pathologists answers for each question and turn them into statistics in order to be more readable and comprehensible.

Chapter III :
Discussion of results

3.1 Introduction

In this chapter, we will discuss the main findings regarding autism spectrum disorder, our research was carried out at the level of the psycho pedagogical center for mentally disabled children in Bouismail- Algeria. The current study aims to find out the causes of autism spectrum disorder and its outcomes on people's behavior, language, learning and acquisition. This chapter deals with the discussion of the speech pathologists questionnaire findings and the discussion of the observation results. Then we will tackle the limitations of the study and finally, this chapter ends with recommendations and suggestions for further research.

3.2 Discussion of the questionnaire results

Using a questionnaire was very beneficial, it served as a data collection source to our research and a background check for our participants to see if we can rely on their answers, we found out that our participants have high college degrees, as they are devoted to their occupation, and they are as well experienced in their line of work and have dealt with many cases before.

Our participants recalled their first contact and first observations about autistic children as they all observed a deficiency in communication and in language contact but also a chaotic behavior that are considered as the consequence of this mental illness. Our sample of speech pathologist suggested two different methods on how to deal with an autistic child either to use severe methods which consists of grounding, punishments and no rewarding system is relied on, or to be tolerant and stimulate them through rewards and compliments.

Even though this mental disease is becoming more common and is affecting more children now days especially boys more than girls, modern medicine could not identify the source nor a medical method to diagnose this illness, although many biological and blood tests were

conducted through the years on many patients nothing unusual was detected, nor the reason why it is more common for boys rather than girls to be diagnosed with this disease. It seems that the only way to identify this mental disability is by observing the presence or absence of certain behavior and the language development. Our questionnaire paved the way for us to know more about the presence or absence of those effects as we found out that some of them varies from a patient to another they can either be present or not, like the intellectual disability, oral language delays and adapting to changes and grasp new things. However, effects like difficulties in communication, difficulties in social contact and avoiding eye contact are always present and found in every autistic patient. From the results, we noticed that all of our participants agreed on the fact that autism spectrum disorder can be diagnosed at an early age due to some anomalies that an ordinary child does not have, those anomalies are not physical but are typically mental and are related to the language, behavior, body contact and learning skills. Another red flag of autism that was repeatedly mentioned by our respondents when answering our questionnaire is that if the child does not show any reactions nor respond to his name and does not babble by the age of 9 months then this child is affected with autism and a speech pathologist intervention is needed respectively.

As autism spectrum disorder is a mental disorder that affects the brain and causes damage at the level of the Broca's and Wernicke's areas ; as a consequence, the learning and acquisition processes in addition to the mental abilities are all impacted as a result of this, the cognitive development is slower, difficult and challenging full of barriers and obstacles, like focusing and memorizing issues that people who are diagnosed with autism spectrum disorder will encounter. Furthermore, all of our respondents claimed that the biggest challenge an autistic patient could face is the integration within a school context with normal people since they are not like others and need more care, time and attention.

3.3 Discussion of the observation results

Using different research tools helps to confirm or dis-confirm our participant's answers and it helps covering what we have missed in our questionnaire or what the questionnaire could not cover, observation is a data collection tool that relies on what have been seen and heard.

We have selected four different cases to observe during a month, the samples selected where children aged as follow 4, 6, 7 and 9, years old. They all have both parents in good health and young as they also have no siblings or relatives that are diagnosed with autism spectrum disorder.

The first case we have observed is a boy aged of 6 years old, he has language and communication problems and his repertoire is very limited for a child of his age as, the child hardly respond to verbal language, each word or sentence you say to him must be repeated at least twice and he only replies to you by saying mmmm, no or shaking his head as for his behaviour he was very calm in presence of his parents but got very violent and refuses to leave them, the speech pathologist gave him some coloring activities in order to establish communication and gain his trust.

The second case we observed is a boy aged of 9 years old he has been treated since he had 4 years old, he is receptive and produces good oral language, but lack the reading and writing skills, he suffers from concentration issues which make his learning very slow, although he has been treated from a young age which helped him improve his oral language skills as he can produce correct and understandable sentences, his interactions with others is very brief comparing to the time he spends playing and interacting with his toys. The boy is calm, likes to remain isolated, he is also very sensitive and love watching TV. The speech pathologist tries to improve his social and communication skills by having discussion over the child

favorite TV shows and by putting him in a group of children that shares the same hobbies as him in order to facilitate the communication with others.

The third case we observed is a boy aged of 7 years old, he does not produce any oral language his only means of communication is by yelling and crying and does not master any of the four skills of language as for his behavior, he is very violent and hard to control, his verbal repertoire and mind are empty as we can notice the absence of the signified and signifier the only sounds he produces have no meaning, this case is considered as a severe case of autism spectrum disorder, his condition was not taken seriously by his parents until recently, this result in worsening his condition, the speech pathologist had to punish him for his behaviour by giving him his less favorite toys to play with or puts on the TV his most hated TV shows, he also teaches him the alphabet, numbers, writing, reading, name of things with their picture like chair, table, door in order to fill the blank in his mind.

The fourth case we observed is a boy aged of 4 years old the child has difficulties in writing and oral language production problems in pronunciation and articulation, his grammatical and phonetic structures are damaged he does not produce correct sentences and swallows words and substitutes them with other words which gives no meaning to what he is saying, as for his behaviour, he is unpredictable his mood can change quickly from calm to anxious and start screaming, running and jumping. When he starts to react like this the speech pathologist holds his hand and orders eye contact in order to control him and to calm him down, the speech pathologist conducted some exercises for the child to do in order to treat his verbal language issues he gave him sentences to repeat, alphabet games and role plays.

3.4 Recommendations and Suggestions

After conducting a study on the cognitive overlap of language in autism spectrum disorder, in this section we will provide general suggestions and recommendations.

- The government should create a special educational programme for autistic children.
- The creation of special schools for autistic children regardless of the severity of their case and provide them with trained teachers that have expertise in autism spectrum disorder to meet the needs of their unique language and social difficulties.
- Create an environment that meets the needs of autistic children within the school and the society.
- Create a governmental special health care needs for people diagnosed with autism spectrum disorder.
- Provide the speech therapists with more modern medical means and a good working environment.
- Introduce autism spectrum disorder to explain its effects and to sensitize people on how to deal with an autistic person in order not to feel rejected from society.
- Developmental surveillance must be incorporated at every health supervision visit.
- Screening tests should be administered regularly at the 9, 18, and 24 or 30 month visits to look for any anomalies or disease.
- The local school system should provide the parents at the beginning of the assessment process with information concerning the best practices in the early education of their autistic child.

- Families that are expressing stress in raising their children's with an autistic spectrum disorder should be provided with mental support services.
- Families with autism spectrum disorder children's should be provided the opportunity to learn techniques for teaching their child new skills and reducing language and behaviour problems.
- Speech pathologists should try to replace behaviour problems with more conventional and appropriate behaviour.
- Parents should encourage their children's speech development through talking, reading, singing, and answering their questions.
- Using gestures and point to objects as you say the corresponding words you can do this with body parts, people, toys and colors.
- If someone asks an autistic child a question, allow them to respond by themselves.
- Enhancing communicative and social skills allows the autistic child to be more involve in family, school and community activities through imitations, social initiation and respond to adults and peers, and interactive play with peers and siblings.
- Cognitive skills should include symbolique play and basic concepts, as well as academic skills.
- Autistic children education must have for objective to develop expressive vebal language, receptive language and non verbal communication skills.
- The government as well as society and schools must create an environment where the autistic child should feel himself integrated within the society.

- The teaching of play skills should focus on play with peers with additional instruction in appropriate use of toys and other materials.
- Social instruction should be delivered throughout the day in various settings using specific activities and interventions.
- Academic skills should be taught according to the needs of the autistic child.
- Instructions that aims at goal for cognitive development should also be carried out in the context in which the skills are expected to be used.
- Information related to learning can be introduced to autistic learners in a variety of ways including conducting experiments on individual's skills or groupes.
- Scientices and doctors should work on the development of other instruments for diagnosing and other means for early screening of autism spectrum disorder.
- New skills should be learned by a small number of autistic children than generalized to other.

3.5 Limitations of the study

In fact we have faced plenty of challenges and difficulties all along the process of collecting data for this research. First, due to the pandemic of covid 19 the access to the pedagogical center was a bit hard due to security and safety measures, secondly the parents of the children refused our presence at first we had to convince them that our presence is purely acadmic and has for purpus to help their childreen but also no personal information would be reveled except for the kids age, gender, medical condition, and the parents age and medical record. Finally, the time constraints is another obstacle that we faced during conducting this piece of

research, it prevented us to observe our samples for more than just a month in order to see the change and development in their language and behaviour that resulted from their treatment.

3.6 Conclusion

This chapter dealt with the major results of our research concerning the cognitive overlap of language impairment in autism spectrum disorder. Hence, the present chapter has inspected and examined the analysis and discussion of the findings provided by the research tools, in addition we spoke about the limitations and difficulties we encountered when conducting our research, finally we gave some recommendations and suggestions for further research.

General Conclusion

General conclusion

Autism spectrum disorder is a mental disability that affects language and behavior of a individual, the changes that occur due to this mental illness make that particular person unfit-able to the society standards and will be rejected and considered as a social outcast, our objectives behind this research are to shed-light on the language impairment that is caused by ASD. In order to undertake this research a number of questions were raised: what causes autism spectrum disorder ?, can autism spectrum disorder be diagnosed at an early age ?, how autism spectrum disorder affects the language ?, and could autism spectrum disorder be cured or reduced ? In order to proceed this work, we have proposed the following hypotheses : children who are born to older parents or have siblings with ASD could inherit this disease. Furthermore, there might be some factors that are considered as a red flag for ASD. Additionally, children with ASD might be slower to develop language skills and understanding. Finally, there might be some psychological and medical intervention to cure or reduce ASD.

The dissertation includes three chapters, the first chapter deals with the literature review. The second chapter is about the practical part and the data collection in order to answer the questions asked. The final chapter concludes with the discussion of the results, the study limitations and recommendations.

Two different research tools have been used in this research, a questionnaire presented to 60 speech pathologists and an observation of four autistic patients at the psycho-pedagogical center for mentally disabled children in Bou ismail, Tipaza.

From the data obtained from the speech pathologists and autistic children we have observed, we found out that the causes of autism spectrum disorder are unknown to this day and many patients we observed are born to younger parents and have no siblings with ASD which disconfirm the first hypothesis. Moreover, we found out that autism spectrum disorder

General conclusion

can be diagnosed at an early age due to some signs that reveals the presence of autism spectrum disorder in that child which confirms the second hypothesis. Our collected data have shown that autism spectrum disorder highly affects language because damages are at the level of broca's and wernick's areas ; therefore, the child will face difficulties in producing, receiving and understanding the language as well as other learning disabilities which confirms the third hypothesis. Finally, when a child is diagnosed with autism spectrum disorder regardless of the severity of his case, psychological and sometimes medical interventions are required in order to reduce the severity of his case and give him a chance to be socialized.

In spite of all that have been mentioned, this investigation offered an overview on a new perspective that has not been studied yet whether in theoretical or methodological way. Serious attention should be given to this category of learners at different levels.

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Appendice

Appendice

Dear participants,

The purpose of this questionnaire is to investigate the cognitive overlap of language impairment in Autism Spectrum Disorder. Therefore, you are kindly requested to answer this survey; your answers are highly confidential.

Part 1:

- Age: 20-25 26-35 36-45 above 45

- Educational degree: License Master Doctorate

- How many years have you been working as a speech therapist: from 5-10
from 10-20 from 20-25

- Why did you choose this occupation in particular : It is challenging i had no other choices

-Do you love this Occupation : Yes No

Part 2:

1) When and how was your first contact with autism spectrum disorder , please share your experience with us:

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2) How did you deal with your first autism spectrum disorder patient, please share your experience with us:

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Appendice

3) How do you diagnose autism spectrum disorder?

- a) biological (blood test)
- b) genetics (karyotype)
- c) clinical (observation of absence or presence of certain behaviors)

4) Autism spectrum disorder is more common for:

- a) boys
- b) girls

5) Please answer the following likert items, tick the frequency that you see appropriate for each statement :

Statement/ Frequency	Never	Rarely	Sometimes	Often	Always
People with autism spectrum disorder have oral language delays					
People with autism spectrum disorder have an intellectual disability					
People with autism spectrum disorder have difficulties in communication					
people with autisms spectrum disorder have difficulties in social relations					
People with autism spectrum disorder avoid eye contact					
People with autism spectrum disorder adapt to change and grasp new things					

6) Could autism spectrum disorder be diagnosed at an early age?

Yes No

If yes, how so?

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7) What difficulties Autism Disorder patients could face in learning and acquiring languages?

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Thank you for your collaboration, time and efforts.

Résumé

Cette recherche vise à examiner la relation entre le langage et l'autiste, les principaux objectifs de cette recherche sont de trouver les causes et l'impact de l'autisme sur le développement de la langue et le comportement des enfants autistes, mais aussi sur la recherche de solutions pour guérir ou réduire cette maladie mentale. La motivation derrière cette recherche est due au fait que l'autisme devient de plus en plus commun mais aussi pour aider les enfants autistes à avoir une chance de vivre une vie normale. Une méthodologie mixte est préparée où des méthodes qualitatives et quantitatives ont été utilisées pour aider à la collecte des données. Ainsi un questionnaire a été remis à 60 orthophonistes ainsi que l'observation du langage et du comportement de quatre enfants autistes ont été réalisées au niveau du centre psychopédagogique pour enfants handicapés mentaux de Bouismail. Les résultats ont révélé que les l'autisme peut être diagnostiqués à un âge précoce. Aussi, les enfants autistes développe lentement la langue. De plus, ils ont des troubles du langage, des troubles de la communication et des troubles d'apprentissage.

Mots clés : Autisme, Trouble de la communication, Trouble du langage, Trouble de la communication, Développement du langage, Enfants autistes, Troubles d'apprentissage,

Comportement.

الملخص:

هدف هذا البحث هو دراسة العلاقة بين اللغة والتوحد، والأهداف الرئيسية لهذا البحث هي العثور على أسباب وتأثير التوحد على تطور اللغة وسلوك الأطفال المصابين بالتوحد، ولكن أيضاً في إيجاد حلول لعلاج أو تقليل هذا المرض العقلي. يعود الدافع وراء هذا البحث إلى حقيقة أن التوحد أصبح أكثر شيوعاً ولكن أيضاً لمساعدة الأطفال المصابين بالتوحد في الحصول على فرصة لعيش حياة طبيعية. يتم إعداد منهجية مختلطة حيث تم استخدام وتصميم مقابلة واستبيان لمساعدتنا في جمع البيانات. وهكذا تم تقديم استبانة لـ 60 ارطوفوني بالإضافة إلى مراقبة اللغة وسلوك أربعة أطفال مصابين بالتوحد على مستوى مركز النفسي البيداغوجي للأطفال المعاقين ذهنياً في بوإسماعيل. كشفت النتائج أن التوحد يمكن تشخيصه في سن مبكر. كما أن الأطفال المصابين بالتوحد يطورون اللغة ببطء. بالإضافة إلى ذلك، لديهم اضطرابات لغوية، وصعوبات في التواصل، وصعوبات في التعلم.

الكلمات المفتاحية : التوحد ، اضطراب التواصل ، اضطراب اللغة ، اضطراب التواصل ، تطور اللغة ، الأطفال المصابون بالتوحد ، صعوبات التعلم، السلوك.