DEMOCRATIC AND POPULAR REPUBLIC OF ALGERIA
MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH
UNIVERSITY OF ABDELHAMID IBN BADIS – MOSTAGANEM-
FACULTY OF FOREIGN LANGUAGES
ENGLISH DEPARTMENT

FILIERE Anglais

MASTER'S DEGREE IN

«Linguistics »

Title:
Applying Verbal Behaviour Approach to Children with Autism Spectrum Disorder: Application of Language Assessment and Treatment

The Public Health Establishment and Mental Handicap Association, The Children's Center in Mostaganem

Presented by:

Dada Hadjar

Board of Examiners:

President: Dr. Benstaali

Supervisor: Dr. Benyoucef Radia

Examiner: Ms. Kaid Omar

Academic Year 2019/2020

Dedication

To my beloved parents,

To my sisters and brothers, especially Meriem

To my friend Imene Bouziani

Thank you for your everlasting love encouragement throughout my research. Without you, I couldn’t overcome my difficulties and concentrate on my studies.

Acknowledgment

Foremost, I would like to express my sincere gratitude appreciation to Dr. Benyoucef Radia for her valuable supervision and generous guidance for my MA study and research.

Besides my supervisor, I would like to thank the rest of my university teachers for their knowledge, encouragement, and support. I also would like to thank Ms. Kaid Omar and Dr.Benstaalli for accepting to exanimate my work.

Great thanks to:

Dr. Bessenouci Islem for his continuous encouragement, observation, and suggested helped to establish the overall pathway of my work.

Dr. Mohamed Haoula head of the speech pathology department at the University of Mostaganem for his wisdom, and academic assistance, in particular, for enlightening me the first glance of my research.

Speech pathologists Tayeb Moukhtaria and Chachoua Fairouz for working with me throughout this research.

My sincere thanks to all the workers at the Public Health Institution in Mostaganem and Mental Handicap Association, the Children's Center in Mostaganem for working with me even though the COVID-19 duration along with the participants and their parents for help and support.

List of abbreviations

ASD: Autism Spectrum Disorder

ABA: Applied Behaviour Analysis

CARS: Childhood Autism Rating Scale

DSM: Diagnostic and Statistical Manual for mental disorders

VB: Verbal Behaviour

VBA: Verbal Behaviour Approach

VB-MAPP: The Verbal Behavior Milestones Assessment and Placement Program

TA: Traditional Approach

Abstract

This research aims at developing the linguistic ability of children with autism spectrum disorder by applying the verbal behaviour approach. We will explore, testify, and validate the application of Skinner's verbal behaviour approach in treating language deficiency in children with autism at a public health institution in Mostaganem. Children's linguistic ability was tested using The Verbal Behavior Milestones Assessment and Placement Program in November 2019, March, and August 2020. The participants were 40 children (33 boys and 7 girls), ranged in age between 4 and 9 years diagnosed with autism. Based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) criteria, participants were identified with autism levels 1 and 2. Participants were divided into 2 groups: 20 of them were from the Mostaganem Public Health Institution and the remaining twenty were from the Mental Handicap Association, the Children's Center in Mostaganem between (November-2019) and (August-2020). This study was based on the first group (N;20 participants) where we applied the verbal behaviour approach precisely, teaching participants verbal operants (echoic, tact, mand, and interverbal) compared to the second group (N;20 participants) where we used the traditional approach of teaching language. Measurement of the progress in language and communication skills was conducted three times in nine months. The data was analysed based on Skinner's analysis of verbal behaviour. The results of the study showed that the Verbal Behaviour Approach is an effective tool for teaching language and communication skills to children with autism. Despite slight variations, all children from group 1 experienced significant improvement in all verbal behaviour domains while group 2 progress was not significant.

Keywords: Autism Spectrum Disorder, Verbal Behaviour, language deficits, linguistics ability, verbal operants.

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General Introduction

Autism Spectrum Disorder (ASD) is a complex early brain development neurobiological disorder that is currently characterized by qualitative impairment in social interaction and communication, as well as minimal, intensive repetitive behaviour. Autism is currently defined as a spectrum disorder with significant variations in the social, communicative behaviour of patients. These symptoms lead to significant impairment in adaptive functioning in multiple domains, moreover, children with ASD require various levels of psycho-social support to achieve autonomy and, in some cases, they require ongoing care. Children diagnosed with autism suffer from various deficits of communication, depending on their age and intellectual abilities. These deficiencies differ from speech delays, poor comprehension skills to a total lack of spoken linguistics ability. Nonverbal communication is also affected and it includes poor eye contact, finding problems in understanding facial expressions, and descriptive gestures. A further important feature of individuals with ASD is social reciprocity deficits. Some individuals are less likely to start communication, have less engagement in peer interactions, and generally find it hard to adapt their behaviour to various social situations. All these aspects affect children with ASD's language development. (Mintz, 2016, Campisi et al., 2018)

Language is among the parameters in the development of children considering it the most essential learned skill in typical developed children and it is for children with autism often noticeably deficient, so, learning language skills are seen as a major goal in autism treatment. This paper will investigate the language development of children with autism spectrum disorder by defining their linguistic strengths, deficiencies, and applying a treatment approach: the verbal behaviour approach, to develop their language. Therefore, the main research question is whether applying Skinner's verbal behaviour approach plays critical role in treat language deficiency in children with autism spectrum disorder? We will also try to answer the following questions:

- How does autism affect language development in children with ASD?
- Do children with ASD go through the same language development stages as typically developed children? And do they learn language in the same way?
- By using the Verbal behaviour approach do we see progress in children with autism spectrum disorder linguistics ability?

To answer the main research question and the sub-question the following hypotheses were suggested:

- The verbal behaviour approach is an effective approach to teach children with autism spectrum disorder' language.

- Children with ASD are more focused on themselves therefore they do not see the need to communicate with people around them, so, they do not get as many chances to develop their language skills. For children with autism spectrum disorders communication development happens differently and slowly due to the neurological problems and sensory challenges associated with the disorder.
- Children with ASD go through the same language development stages as typically developed children but with a noticeable delay but, they learn in the same way.
- Yes, by using the verbal behaviour approach we see significant progress in children with autism spectrum disorder's language development.

This study consists of three chapters. The first chapter presents an overview of autism spectrum disorder(ASD). ASD is a neurological and developmental disorder that begins early in childhood and lasts throughout the life of a person. It influences how one person behaves, interacts, communicates, and connects with others. In this chapter, we will define autism spectrum disorder and talk about its prevalence and hoe its historical roots. Then, it is not clear what causes ASD but evidence indicates essential functions are played by both genes and the environment, we will explain these causes more in dept. Moreover, autism is considered a "spectrum" disorder meaning it has a range of symptoms that can occur in individuals with ASD we will go through them. Besides, for, diagnosing ASD and knowing the type also some various examinations and assessments are carried out to. Finally, there is no specific treatment for ASD at this time, but there are many ways to improve the capacity of children to develop and learn new skills.

The second chapter will demonstrate the verbal behaviour approach by skinner 1957. In it, we will define the verbal behaviour approach and the association of speaker and listener in communication. Then, we will define the principles of behaviour denoting that all behaviours are evoked by motivation and maintained by reinforcement. Next, we will talk about Verbal Behaviour and Properties of Language: different between Form Vs Function, which, lead us to the description of Skinner's primary verbal operants (Mand, Tact, Echoic, Intraverbal) Finally,

we will describe how an understanding of Skinner's analysis can lead to more effective and efficient language teaching approach for children with ASD.

In the third chapter, we will provide a practical implementation of the verbal behaviour approach to children with Autism Spectrum Disorder where we will experiment with their linguistic ability. we applied the verbal behaviour approach precisely, teaching participants verbal operants (echoic, tact, mand, and interverbal) We will testify the validity of the verbal behaviour approach by comparing it to group children with ASD that have been exposed to the traditional approach. We will go through the protocol of both approaches and collecting the result from both approaches, following this, the finding will be dissected.

In this chapter, we will define autism spectrum (ASD) disorder and explore its prevalence and historical origins. Then, yet what causes ASD is not clear but research suggests that both genes and the environment factors serve important roles, we will further clarify these reasons. Moreover, autism is a "spectrum" condition meaning that individuals with autism are capable of receiving a variety of signs and it will differ from one patient to another. Besides, there are also specific tests and evaluations for diagnosing ASD and understanding the condition. There is currently no formal therapy for ASD, but several means of developing children's capacity to learn and acquire new skills are possible.

1. Defining of autism

a. Term

While everybody grows at slightly different rates, nearly everyone meets the same average developmental milestones and learn the same skills in approximately the same timeline. As the brain develops, these abilities advance and include: language and communication; social interaction; cognitive skills, such as problem-solving, physical goals: such as walking, running, and fine motor skills. If any of those skills are not developed as scheduled, they can be described as a type of neurodevelopmental disorder, neuro refers to the brain, depending on the severity of the delay. When socialization and communication skills do not proceed as planned, they can lead to isolation. This is where the name autism originated: autism means 'self,' and so autism refers to a disorder where a person may be excluded from social interaction or communication, leaving them alone or isolated. Defined by a severe language disorder, communication, and social interaction. (Desai et al., 2016)

b. Medical definition

The National Institutes of mental Health (2018, p.02) defined autism spectrum disorder (ASD) as “...a developmental disorder that affects communication and behavior. Although autism can be diagnosed at any age, it is described as a “developmental disorder” because symptoms generally appear in the first two years of life.” In other words, Autism is a lifelong developmental disability that affects how a person communicates and interacts with others and the world around him/her.

According to Copeland (2018), ASD is a developmental disorder that is characterized by an ongoing difficulty in verbal and nonverbal communication, social interaction, and repetitive behaviour. There is extensive variation in the type and severity of symptoms, therefore, it is

known as a “spectrum”. The Mayo Foundation for Medical Education and Research (2018 para. 02) stated that “Autism spectrum disorder includes conditions that were previously considered separate — autism, Asperger's syndrome, childhood disintegrative disorder and an unspecified form of pervasive developmental disorder.” Typically, there is nothing different about ASD people's appearance that separates them from other people, but people with ASD can speak, connect, respond, and learn in ways that differ from most people. The skill of ASD individual’s learning, thinking, and problem-solving skills can range from being creative to being significantly impaired. Some people with ASD require a great deal of help in their everyday lives while others need less. (CDC Centre for Disease Control and Prevention, 2020)

2. Prevalence of Autism Spectrum Disorder

A. Worldwide

According to the world health organization (2019), one in 160 children worldwide were estimated to have autism. In Autism Speaks Inc (2020), it is estimated that one in 59 children is autistic. According to the Centre for Disease Control and Prevention (2018), it affects boys more than girls for about four times. Although autism affects all segments of society yet minority groups appear to be later diagnosed and less often. The Centres for Disease Control and Prevention estimates that one in every 68 individuals in America is diagnosed with ASD, with one in 42 boys and one in 189 girls diagnosed. This is more than a 30 percent increase since the 2008 report.

B. Algeria

Moving on to Algeria, Slimani (2018) said: “More than 4,000 autistic children have been taken care of in 2018 in health facilities nationwide, said … Pr Mohamed Chakali, Sub- Director for the promotion of mental health at the Ministry of Health, Population and Hospital Reform.”

3. History of autism

According to (Tucker, 2020) the first person to use the term autism was the Swiss psychiatrist Eugen Bleuler referring to a category of symptoms related to schizophrenia concerning lack of interaction with reality, often in the indulgence of surreal imagination. Deriving it from the Greek word “auto” meaning self. In 1922 he coined the term autism as an escape from reality. In 1943 Dr. Leo Kanner the child psychiatrist at Johns Hopkins Hospital published a paper named "Autistic Disturbances of Affective Contact" in the journal Nervous Child. He

describing 11 young patients who seemed to inhabit a private world, ignoring the people around them, even their parents. He believed that autism is a form of infantile psychosis caused by cold unaffectionate parents. Kanner's syndrome was first identified in children, later called "early infantile autism". This article was the first paper that defined autism as a single ideal disorder, separated from schizophrenia. (Cohmer, 2014)

Lorna Wing cognitive psychologist found a paper written by Hans Asperger (1944) that was translated to English in 1981. At about the same time, Hans Asperger reported similar conditions, now called Asperger's syndrome. Hans Asperger (1944) ran a clinic residential school in Vienna in the 1930s. In his paper 1944, one year after Leo Kanner (1945) published his iconic article on autism, Asperger identified a particularly interesting and highly recognisable type of children he called "autistic psychopaths". In most aspects, they resembled the children of Kanner's (1945) description. Like Kanner, Asperger presented case studies. He identified four boys, describing their clinical features and their commonalities. The cases he mentioned were all extremely smart boys had good cognitive and language skills but had problems with social relationships, motor clumsiness, and particular obsessive interests. Asperger (1944) viewed autisms as an astonishing range of giftedness and disability but, he never blamed parents. He claimed that autism is a lifelong condition that needs compassion supports. (Mcpartland et al., 2012)

The Empty Fortress: Infantile Autism and the Birth of the Self written by Bruno Bettelheim (1967) was the most popular book for communicating the psycho-genesis theory. At the dawn of life, it located the origin of autism in disordered interpersonal relations. Herman (2019, para. 01) said: "The Empty Fortress was the most popular book to communicate the theory of psychogenesis, which located autism's origin in disordered interpersonal relationships at the dawn of life". In 1967 Bruno Bettelheim wrote about three children in The Empty Fortress and he named them autistic, saying that their condition was due to their mothers ' coldness. He disengaged the parents from the children's therapy. Bruno Bettelheim, psychoanalytic story about development in helpless children protected themselves from their parents ' brutality and hostility, mothers in particular by withdrawing from the social environment. Autism was believed to be rooted in cold and unemotional mothers, nicknamed 'refrigerator mothers' by Bruno Bettelheim. In the 1960s to the 1970s, the idea of the 'refrigerator mother' was disproved when research revealed that autism has biological origins and is rooted in brain development. (Herman, 2019)

In the Diagnostic and Statistical Manual for mental disorders (DSM) by The American Psychiatric Association: The first edition, published in 1952 the term autism appeared once, in conjunction with schizophrenic responses in young children. The second edition of the(DSM-II) published in 1952, defined autism as a "psychiatric condition", a type of childhood schizophrenia characterized by a detachment from reality, whereas, the third edition (DSM-III) published in 1980, presented the term "Infantile autism", established autism as a separate diagnosis and described it as a "pervasive developmental disorder" for the first time; the condition is separated from childhood schizophrenia. In 1987 The DSM substitutes "infant autism" with a more generalized definition of "autism disorder" and incorporates a diagnosis criteria checklist. It defined features of autism: lack of involvement with people, extreme cognitive impairments in communication or language development, and strange environmental reactions. All have to develop in the first 30 months of life. Next, the fourth edition published in 1994, was the first edition to categorise autism as a spectrum; describing autism as one of several pervasive developmental disorders. "The number of possible diagnostic criteria had increased to sixteen and four subcategories were listed under Autistic Disorder: Asperger's Disorder, Pervasive Developmental Disorder, NOS (not otherwise specified), Rett's Disorder, and Childhood Disintegrative Disorder." (Herman, 2019, para 04) Finally, under the new diagnostics and statistical manual, the fifth edition published in May 2013. The new revised edition removed these terms and folds all subcategories of the condition disorders (autism, Asperger's disorder, and Pervasive Developmental Disorder–Not Otherwise Specified), replace them with an umbrella term: autism spectrum disorder (ASD) and encompasses all the previous developmental disorders, but uses a scale or a spectrum to differentiates based on the severity of two major areas:

a. Social communication and interaction deficits
b. Restrictive or repetitive behaviours interests and activities

DSM 5 uses a scale or a spectrum that differentiates based on the severity of two major areas demonstrated in Figure 1.

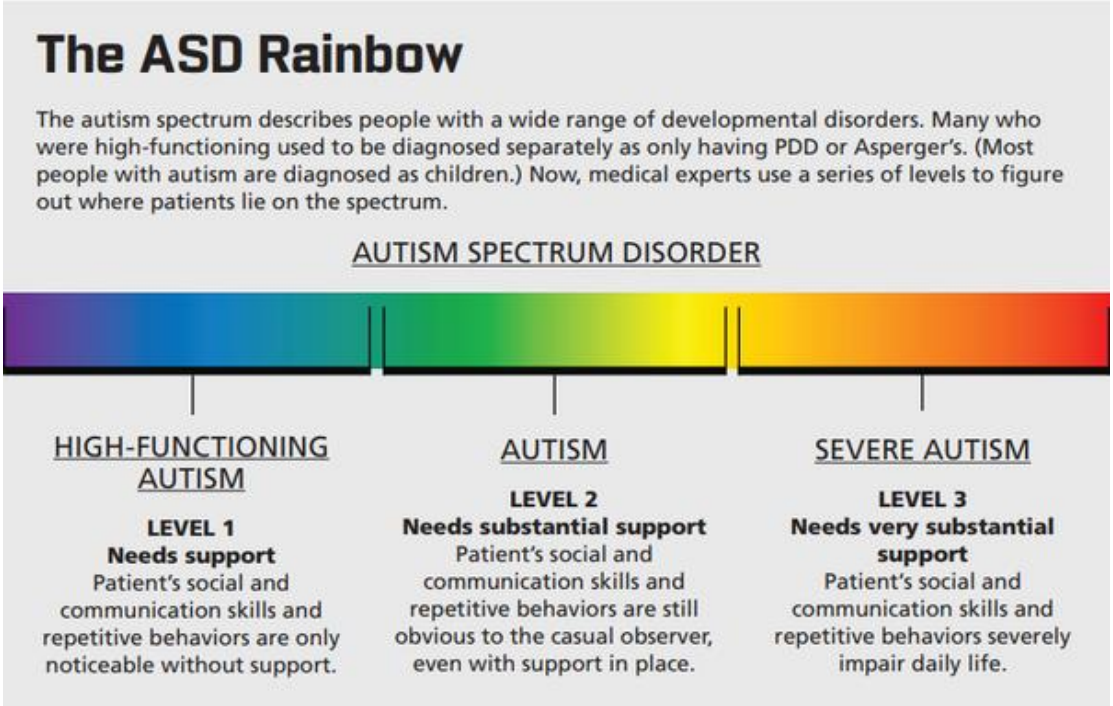

Figure 1: Autism Spectrum Disorder Scale

Note: Reprinted from cyberpsychologist, retrieved from https://www.houseoftroy.co.za/what-is-autism/

Different people with ASD fall along a spectrum and along this spectrum, there are different symptoms (different challenges and different abilities that vary in severity and vary between different people with ASD.

4. Causes and risk factors

According to (Campisi et al., 2018) scientists remain unsure of the exact causes of autism spectrum disorder but studies indicate that genes can function in combination with environmental factors to impacts the development of ASD. (Campisi et al., 2018 p.93) said," Although family studies support a strong genetic component in the aetiology of idiopathic autism, concordance rates are not 100%, indicating that environmental factors also contribute to ASD."

A. Genetic factors

Genetic factors appear to be important for example, identical twins are much more likely than fraternal twins or siblings to both have autism. Some reports also indicate higher outcomes for

families with two or more autism-diagnosed children, with rates reaching 50%. (Campisi et al., 2018)

B. Environmental factors

National Alliance on Mental Illness Currently (2015) points out that scientists are studying numerous environmental factors that are assumed to lead to ASD. Prenatal factors, including the mother's health, may contribute to the development of a child. Additional postnatal factors may also influence child growth. Despite various media reports, clear evidence that vaccinations do not cause ASD has been seen. A recent 10-year meta-analysis established several environmental risk factors from early childhood to the pre-conception of ASD. More studies are necessary because there is no evidence to support causality and is not definitive. (Campisi et al., 2018)

No other topic in the autism world received more publicity and debate than the vaccines and their possible causal connection to autism. The problem was first posed in 1998 after an article published in the Lancet postulated a causal link between vaccine (MMR) and autism development. Nevertheless, a vast body of scientific research has since been provided to refute the correlation between ASD and MMR never the less, the topic is still controversial. The study received considerable media attention. The initial article on this subject published in Lancet was retracted in 2010 citing that 'several elements' of the 1998 paper 'were incorrect, contrary to the results of an earlier investigation. (Campisi et al., 2018). The American Academy of Pediatrics and the Center for Disease Control and Prevention (2019) report that there is no proven link between autism and the MMR vaccine, or any other vaccine.

C. Risk factors

Though scientists tend to seek to explain why some individuals experience ASD and others do not, some factors raise the risk of developing ASD includes: having a family member with ASD, having older parents, having certain genetic conditions (e.g., Down syndrome, fragile X syndrome, and Rett syndrome are highly probable to have ASD than others) also, having a very premature birth weight. But not all individuals with these risk factors experience ASD. (National Institute of Mental Health, 2018)

5. Signs and Symptom

According to (National Alliance on Mental Illness, 2015) the autism spectrum consists largely of communication problems or social impairments where we can identify these signs and symptoms. Children with autism spectrum disorder ASD generally display problems with

communication and social interaction, also produce a series of unusual behaviours having to do with rigidities, repetitive motion, and stereotype interest. As we know, children are social by nature, ones can observe the sign of autism and distinguish their reaction to the world around them from their typical peers. "The term "spectrum" refers to the wide range of symptoms, skills, and levels of impairment or disability that people with ASD can have. Some people are mildly impaired by their symptoms, while others are severely disabled." (National Alliance on Mental Illness,2015 p. 1)

A. Signs and symptoms according to the NSH

The NSH provided a list of the sign and symptoms of autism:

- Do not respond to their name
- Language development delays
- Do not smile when you look at them
- Abnormal Tone of Voice
- Avoiding eye contact or poor eye contact1
- Language development delays
- Problems with Two-Way Conversation
- Difficulty interpreting facial expressions lack understanding social cues (like the tone of voice or body language).
- Difficulty in interacting with peers
- Learning Disability or Difficulty
- Repetitive and routine behaviours
- Problems with expressing emotions
- Have a strong interest in some subjects or activities
- sensory problems
- Do not like to follow orders
- Intense Focus on One Topic Preoccupation with Specific Topics
- Self-harm behaviour
- Sleep Disturbances
- Cling to daily routine and get disconcerted if it changes

They also mentioned that autism may be difficult to identify in girls because, autistic girls may appear to be quiet, they may hide their emotions and tend to coup with social situations better than boys.

B. Sign and symptoms according to the Diagnostic and Statistical Manual for mental disorders DSM V:

There are a few key signs among people with ASD and different ways that we can characterise these common signs: Sign and symptoms according to the DSM 5 (American Psychiatric Association, 2013, P.50)

- First, Deficits in social communication and social interaction

“Deficits in social-emotional reciprocity” autistic people have difficulty with joint attention, the state of wanting to share an interest with others. They are additionally unaware of people's feeling and even characterising or understanding their feeling add to that, they may display a scarcity of initiation of social interaction and a lack of two-way conversation. Next, "Deficits in nonverbal communicative behaviors used for social interaction" They may have difficulty understanding and using verbal and non-verbal communication, for example, poor eye contact, hand gestures like waving or pointing, and minimal speech or no-speech. Third Deficits in developing, maintaining, and understanding relationships. Autistic children may have a relationship with their caregivers but don't know how to have a relationship outside that safety of their home. Difficulty sustaining interaction and often prefer to be alone. Moreover, difficulty adjusting their behaviour to suit the different social contexts, behave in the playground, and another in the classroom also lack creativity while playing.

- Second, “Restricted, repetitive patterns of behavior, interests, or activities" It can embody a variety of different behaviours. The child may be bounded on certain routines or restricted patterns of interest. They are also characterised with repetitive motor movements including hand flapping or spinning also called self-stimulatory. Most verbal and minimally verbal autistic children have Echolalia: repeating what is been said or delay echolalia: once they repeat words or phrases they detected before and may or may not be appropriate for a certain situation. Moreover "Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior". To illustrate, be extremely displeased for any transformation in their lives. they may insist on a certain routine, for example, going through the same road or eating the same food daily. Also produces a series of very unusual behaviours having to do with rigidities, repetitive motion, and stereotype interest. Furthermore, "Highly restricted, fixated interests that are abnormal in intensity". Having interest and knowledge about one topic and exclude everything else additionally has a strong attachment or concern for an odd object. Fourth Hypersensitive to loud noises and tactile avoiding hair cutting, also avoiding

bright lights and chaotic environments. Sensory seeking like may want to smell and touch a lot of objects. Have a different sense of pain, heat, or cold leads to a lack of express what hurts them. Finally, According to (Huerta. et al. 2012), children with ASD might exhibit one or more of these deficits. The expression of autism sort of varies along several dimensions, with that in mind it is important to remember that each child with autism spectrum disorder is going to have a different spectrum of symptoms and deficits.

C. Speech and language symptoms

Many children with Autism Spectrum Disorder have difficulty in talking and understanding languages. Include symptoms: language delay special after the age of 2, also children with autism might speak in an atypical tone or with an unusual rhythm or pitch. As well as, repeatedly sounds words and phrases without any intention of communicating or interacting with others. Moreover, most children with ASD find it difficult to start or maintain a conversation, also, find it hard to mand for their needs. Addionaly do not understand basic statements or questions and tern taking when speaking. Finally, children with ASD have a lack of humour, irony, and sarcasm they take what is being said literally (word by word). (Smith et al., 2019)

6. Diagnose of autism spectrum disorder

According to the (Centers for Disease Control and Prevention, 2019), there are no biological markers or medical tests, like a blood test, that can be performed to determine whether the child does or does not have autism. For that reason, to diagnose the child, we have to perform a close analysis of the child's symptoms and behaviours.

A. Diagnose of autism spectrum disorder according to The Diagnostic and Statistical Manual for mental disorders DSM

To help us with diagnosing ASD there is a manual or a guidebook called the Diagnostic and Statistical Manual of Mental Disorders (DSM). Their current requirement for diagnosing ASD are split in into two main categories that we mentioned before.

a. Social communication and interaction deficits.

b. Restrictive or repetitive behaviours interests and activities.

B. Diagnose of Autism Spectrum Disorder according to The Childhood Autism Rating Scale

In the 1960s and 1970s, researchers were able to establish assessment scales that were used to help identify ASD, based on the core symptoms, one of these measuring methods is CARS.

CARS-2: Childhood Autism Rating Scale–Second Edition (Schopler el. at. ,2010)

CARS-2 was developed by Eric Schopler Mary E. Van Bourgondien Glenna Janette Wellman Steven R. Love in 2010

The Childhood Autism Rating Scale–Second Edition (CARS2) is 15 items rated on a 7-point scale range from 1 to 4, a higher score indicates great severity, and a low score indicates a low effect.

CARS is used to identify children 2 years of age and older with autism and distinguishing them from developmentally disabled children (severe cognitive deficits) who are not autistic.

It includes two rating scales:

1. CARS Standard Version (CARS2-ST): used with children under the age of 6 and any individuals of any age with less developed verbal skills and IQs score below average.
2. Newly developed high functioning version (CARS2-HF): used with individuals estimated IQs scores with 80 or higher, verbally fluent and 6 years of age or older.

Alone with Questionnaire for Parents or Caregivers (CARS2-QPC): to collect more information to support in the decision-making form CARS2ST and CARS2-HF ratings.

Rating is based on 4 aspects of behaviour. (Schopler el. at. ,2010)

According to (Davis, 2011) the frequency: how often the behaviour accrues

1. Frequency: how often the behaviour accrues
2. Intensity: describes the extremeness of the behaviour and how difficult it is to sprees
3. Peculiarity: describes the extends to which the behaviour is unusual for a person of that age.
4. Duration measures how long the behaviour last

Scoring: The rating is base on the client's behaviour when compared with a typically developed human in the corresponding age range. The behaviours are the bases of the question used throughout the assessment (the 15 items)

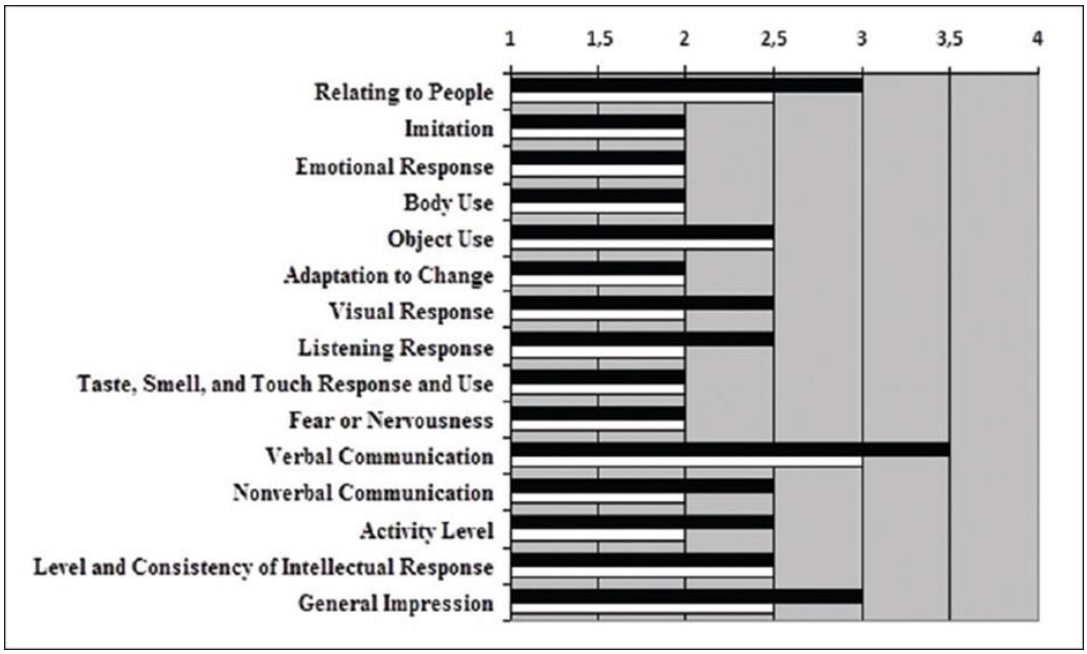

Figure 2: Profile of the scores of the 15 items included in the Childhood Autism Rating Scale, 2nd Edition.

Note: reprinted from the journal of paediatric neurosciences. Retrieved from http://www.pediatricneurosciences.com/viewimage.asp?img=JPediatrNeurosci_2016_11_3_225_193363_f1.jpg

Huerta. et al. (2012), mentioned "A study of 54 children aged 18 months to 11 years with diagnoses of autistic disorder found complete agreement between the CARS and DSM-IV criteria". According to Rellini et al. (2004), there are different dimensions to the presentation of autism spectrum disorder. Some children with autism will never develop speech, while others are very talkative or verbose. Some children with autism have tremendous sensitivity around other people and they are perturbed, sometimes even by the proximity of others. Other children are very interested in interacting with other kids, but they lack basic knowledge of how to carry these kinds of interactions successfully. Some children have tremendous learning difficulties, whereas, others are very bright and talented in many different ways. "because of this variability in symptom type and severity, diagnostic decision-making is a complex process; no singular algorithm can be applied to the diagnosis of ASD." (Huerta. et al. 2012, p.2). Diagnosing is also difficult due to its being a developmental disorder meaning, the symptoms of autism are expressing differently depending on the child's age and cognitive level. A different set of symptoms in an 18 Month that in a five-year-old, then 16 years old. Autism changes with development so, a child who cannot speak at a young age may look different with autism then,

when they learn to speak and they may be able to communicate then but would face problems in social interaction. (Huerta. et al. 2012)

7. Treatment

National Center on Birth Defects and Developmental Disabilities, Centers for Disease Control and Prevention (2019) proclaim: there have currently been no treatments for ASD, but some methods use with young children have been created and researched. These interventions can reduce symptoms, improve cognitive, everyday life skills, and maximize the child's ability to function and participate in the community.

Dixon. el at. (2009)points out that the growing number of infants and adolescents diagnosed with ASD over the past two decades, successful and adequate therapies are required for the children. ASD is in need for an appropriate and adequate child's care. Even though, there are multitudes of autism treatments available, very few have been the subject of scientific research. A treatment based on applied behaviour analysis is the only treatment that has been supported by substantial empirical research. Autism Speaks states that “ABA is widely recognized as a safe and effective treatment for autism”; and “Behavior analysis is a scientifically validated approach to understanding behavior and how it is affected by the environment.” As cited in (Hagopian. el at., n.d.). The National Center on Birth Defects and Developmental Disabilities, Centers for Disease Control and Prevention (2019) define that behavioural intervention methods focused on the development of social communication skills, especially when the child naturally develops these skills and the reduction of limited interests and repeated, challenging behaviours. While there is no cure for autism spectrum disorder, intensive, early treatment can make a big difference in the lives of many children. Tartakovsky (2020) level 1 includes high-functioning individuals who need “support.” Level 2 includes individuals who require “substantial support,” and level 3 includes individuals who need “very substantial support.”

8. Linguistics theories and autism

The primary diagnostic criteria for autism under the DSM-5 are "verbal communication" disorders, any approach to children teaching autism must have a significant component of language intervention. The question is what language theory should be utilized to frame the assessment and process? Language theories are varied in their biological or cognitive form (Brown, 1973; Chomsky, 1957; Piaget 1952; Pinker, 1994; Slobin, 1973). Noam Chomsky is recognised for his intense critique of Skinner 's study of verbal behavior as one of the most

respected psycholinguists (Chomsky,1959). However, considering Chomsky's prevalent perception of Skinner and his linguistic beliefs as false, Chomsky 's argument is yet to be extended to autism challenges by those who uphold Chomsky's stand on language acquisition. In comparison, the key aspect of today's 'successful therapies' for children with autism is in clinical science, including Skinner's study of verbal behaviour. In addition, behavioural psychology, like Skinner's verbal behavioural analysis, provides children with autism a foundation of modern effective treatment. However, cognitive psychology still provides the foundation for many speech therapies and intervention services used by children with autism. (Esch et al.,2010),

In this theatrical context of language, it is common to divide language into "expressive" and "receptive" components. Skinner objected to this dichotomy and conceptualised the foundation of language because the most important aim of teaching children with autism is to communicate what is named “expressive language” is made up of several different language functions. That is, the same word can have different definitions (or "meanings"), and a child with autism can illustrate one feature of a word, but not another. A child may say "spoons," for example, when he sees a spoon or because he wants a spoon("mand) " or he may say" spoon " when he hears" knife, fork and ... " (intraverbal). From Skinner's point of view, although the same word is given in each example, the word is evoked by different antecedents and therefore, has different functions. Children with autism can emit one feature (often tact) but not the others. Therefore, if one word "expressive language" occurs across all these three functions, the evaluation and intervention process can neglect substantial distinctions and potential language deficits. (Sundberg, 2016) In the next chapter, we will present Skinners' theory of Verbal behaviour in more details.

The second chapter reveals Skinner's linguistic approach 1957. In it, we will describe the verbal behaviour approach and the connection between speaker and listener. We would then describe the basic values of behaviours and how they are guided and reinforced. Next, we will address the verbal behaviour and linguistic properties: separate from and function to guide us to the definition of the Skinner 's key verbal operators (Mand, Tact, Ecoic, Intraverbal). Eventually, we will explain how an interpretation of Skinner will help children with autism spectrum disorder ASD learn languages more effectively and efficiently.

1. Verbal Behaviour

Applied Behavior Analysis Programs Guide (2020, para. 02) stated that "Verbal Behaviour is one aspect of Applied Behavioural Analysis (ABA). It is a method of teaching communication to people who have not yet acquired language." ABA strategies for particular problem behaviour have been proven to be consistently successful and ABA has been shown to be beneficial when used for learning reasons, independent living ability, communication, cognitive skills, and vocational skills. (Volkmar et al., 2014) Moreover, the verbal behaviour approach considers language as a form of behaviour that is tied to the standards of behaviour. ASCEND's research has shown how verbal behavior promotes language comprehension, thus increasing language usage in social contexts. (ASCEND, 2020)

Special Learning Inc (2020, para. 02) mentioned that verbal behaviour (VB) and applied behavior analysis (ABA) "are both derived from philosophies established by Skinner, they use different approaches to teaching language. Some believe that Verbal Behavior Intervention is a good addition to ABA. In addition, Barbera (2007) declared that the book verbal behaviour written by Skinner (1957) is a very complex book, presumably why it has been mostly neglected for decades. It was not until Dr. Jack Michael and his Ph.D. student Mark Sundberg at Western Michigan University started adapting verbal behaviour's language teaching principles to children with a variety of developmental disorders that anyone made mention of Verbal Behaviour 's interventions.

2. Development of Verbal Behaviour

Skinner studied animals, such as pigeons, to examine how systematic changes in consequences and antecedents can result in systematic changes in behaviours. He gathers all his knowledge of how learning works and started applying it to language among his student at Harvard University

inside a graduate-level course. His notes form theses lectures became the premise for the book, Verbal Behavior (1957). (Frost & Bondy, 2006)

Applied Behavior Analysis Programs Guide (2020) noted that the book was criticized as a result of it had been no empirical studies or experiments to support it; it was merely a collection of theories supporting Skinner's observations. Nonetheless, in the nineteen seventies Mark Sundberg, Vincent Carbone, and James Partington started to investigate his theories as a method for treating certain language deficiencies. This led to the development of a therapeutic approach based on the ideas of Skinner. Since then, the intervention has enabled many people, including autistic children, to learn language alone or in combination with other methods.

Timeline:

1957 – Skinner wrote Verbal Behavior

1960's – Lovaas begins research at UCLA with children with autism using operant conditioning methods (discrete trial training)

1970's – Michael begins teaching verbal behavior at Western Michigan University – Sundberg begins researching verbal behavior with Michael and Partington

1982 – Sundberg started the Analysis of Verbal Behavior journal

1998– Sundberg and Partington published Teaching Language to Children with Autism or Other Developmental Disabilities and The Assessment of Basic Language and Learning Skills (ABLLS)

2008– The Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP) developed by Mark Sundberg

3. Defining the Verbal Behaviour Approach

In 1957 Buress Frederick Skinner published a book named Verbal Behaviour (VB) which described his theory of language acquisition. He assumed that language was acquired in the same way as all behaviours are acquired, through association and reinforcement. (Skinner,1957). Also "skinner (1957) believed … that language is just another learned behaviour: he, therefore, coined to term verbal behaviour to replace the cognitive-linguistic term language. "(Maul el at., 2016, p.28)

Skinner refers to verbal behaviour as "…behavior reinforced through the mediation of other people… (p.2)" and specified that "…the 'listener' must be responding in ways which have been conditioned precisely in order to reinforce the behavior of the speaker ". (Skinner,1975. p.2) Simply put, the speaker behaves in a way that is under the stimulus influence of the audience (the listener) and the listener then provides the reinforcing consequence. Frost and Bondy (2006) pointed that Skinner's definition of verbal behaviour aided us to identify behaviours that are not verbal behaviour, they said" Behaviors that lead to direct access to reinforcing consequences are not communicative because access to those consequences is not dependent upon another person." (Frost & Bondy, 2006, p.104), for instance, if a child moves towards a table, and takes a book, we will say that his behaviour targeted directly the book therefore is not communication. On the other hand, we would say that this behaviour is verbal behaviour only if the student tells the teacher at the table "I want this book," and then the teacher gives it to the student. So verbal behaviour takes place between two people, it involves interaction between the speaker and the listener, in which, the speaker has access to and influences the environment through the behaviour of the listener. Skinner (1957) also extends this theory to nonverbal languages such as body gestures and others modalities. Frost and Bondy (2006) add that when thinking about verbal behaviour we need to decide whether the modality is really important in the definition that is "speech" is not necessary for verbal behaviour to take place and communication can happen if different modality. There are extensive sophisticated language systems in a non-speech modality such as written languages, sign languages, pictures as in (PECS). Also a mean of language where the "speaker" stimulates the skin of the "listener." In recent years we have voice output devices and electronic systems anything that I do to influence another person would be verbal behaviour.

According to (Special Learning Inc, 2020) B.F Skinner has invented the term verbal behavior (VB). Verbal Behavior is a language teaching method that promotes the idea that the meaning of a word is found in its functions. To teach the meaning of a word to a child with a language delay, one's must first teach its function (operate). Rather than just teaching a word, we also need to teach them how to use those words functionally. For instance, a child with ASD may say the word "restroom" when he or she observes one, but may not be able to say "restroom" when he or she needs to use the restroom or respond correctly when asked for what it is used for. Barbera (2007) added that VB is an important tool to teach language skills to ASD and other disorders. She said in identifying verbal behaviour as "Language is treated as a behavior

that can be shaped and reinforced while careful attention is paid not only to *what* a child is saying but why he or she is using language. ". (Barbera, 2007, p.19)

Later in the book Skinner refines his definition by noting that"…the 'listener' must be responding in ways which have been conditioned precisely in order to reinforce the behavior of the speaker [by the verbal community]…" (p. 225) Skinner is pointing that language takes place within a particular community, we learn in English how to respond to certain sounds characteristically, by saying (apple) in an English community (audience)will give the speaker an apple but if the speaker says the same sound combination "apple" in a French community he will not receive the apple. In other terms, a speaker behaves in a manner that is under an audience's (a listener's) stimulus influence, and then the listener provides the reinforcing effect (consequence). A child learns the grammar and vocabulary of a verbal community by reinforcement of a similar verbal group (the French, the English, the Spanish). Whereas nonverbal behaviour is reinforced directly through contact with the physical environment essentially if the speaker acts on the physical world directly, that is the speaker picks up a glass of water and drinks it, here the speaker is arranging his own reinforcer there is no communication in this act. (Frost & Bondy 2006)

4. Three-term contingencies

Maul et a, (2016, p.34) said that "Skinner focus on the cause and the effect of the verbal behaviour", and broke it down into 3 parts that he named the "three-term contingency" often known as the ABC of behaviour where is he analysed and describes verbal behaviour in terms of the:

a. The antecedents, their evoking stimuli
b. The communication behaviours
c. The consequences (e.g. how the listener reacts)

A. Antecedent Conditions

Maul et al. (2016, p.34) demonstrated that "Antecedent conditions might include some state of deprivation or aversive stimulation, referred to … as a motivating operation (OM): some aspect of the environment that stimulates a response: or the verbal behaviour of others.". For instance, if it is been many hours since the speaker has had something to eat, the speaker much more likely to ask for food and if the speaker enters a room and sees a shelf full of books, he is much

more likely to start talking about books. We should also remember there are other ways that we can make contact with the environment: we can smell, taste, hear, see, and feel things. Every type of interaction can influence and stimulates our verbal behaviour Another type of antecedent that can influence our verbal behaviour is the verbal behaviour of someone else, for example, a person can come up to the speaker and begins a conversation with him. The speaker may not be responding to some aspect in the environment or any state of deprivation but is rather responding to the words the other person is using. Over time the speaker can learn to speak to himself, has his own verbal behaviour, when we think about syntax or grammar, how do we learn to say "I want a ball? We don't say ball I want, but it comes out in a certain order, and my attitude towards the word ball begins to affect certain terms the speaker uses, but we are going to stick to the earliest aspects of verbal behaviour, when we are initially influenced by the verbal behaviour of others. (Pomaville 2016, Maul et al, 2016).

B. Consequence Conditions

Maul et al. (2016, p.34) explained that "Consequences are the result following the behaviour and may direct and tangible, such as receiving an item that is requested, or social and educational, such as specific praise or big smile." The consequence is something that happens directly after a behaviour occurs: the outcome that follows a behaviour that might influence the rate of that behaviour. For example, if the speaker asks for "water" and someone gives them water, the speaker is much more likely to say that word again, on the other hand, if the listener does not hand the speaker water, he is much less likely to say that word again. For instance, a child is looking out a widow and suddenly goes "car" while pointing out of the widow his caregiver would say "yes it's a car" in this situation what has fallowed his verbal behaviour is a social consequence he has garbed his caregivers' attention she/he is interacting with him but, he is not changing anything would regard to motivating operations. Skinner also described this as educational, his point was that we are teaching children to use particular words in particular situations. (Maul et al, 2016).

Rather than classify verbal behaviour such as phonemes words or phrases linguistically, Skinner divided them into functional units based on the associated antecedent and impact(consequence) stimuli. In fact, Skinner has characterized the function units (verbal operators) of verbal behaviour into mand, tact, echo, and intraverbal. (Maul et al, 2016). Table 01 provides a description of verbal operant based on their typical antecedent and consequence.

Table 0 1: *Functional Units of Verbal Operants*

Antecedent	Behavior	Consequence
A state of deprivation or an aversive stimulus	MAND	Primary reinforcement that reduces deprivation or aversive stimuli
An environmental object or event	TACT	Social reinforcement
Verbal behavior of another person	ECHOIC	Social reinforcement
The speaker's or another person's prior speech	INTRAVERBAL	Social reinforcement

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C. Generalising a behaviour

Maul et al. (2016, p.34) said: "Reinforcing the desired verbal behavior, while exposing the child to a variety of stimuli and conditions, increases the probability that the behavior will generalize, thus potentially improving communication even more. "(When a verbal behaviour is formed, the conditions it takes place in and the reinforcement(stimuli) used to provoke it are essential to enhance the impact of the response. For example, if a child is taught the verbal behaviour "ball" this behaviour (word) will be reinforced through generalisation: by presenting the child to several different types of balls (tennis ball basketball and football), colures (red, blue and yellow) and even different sizes (small, medium and big). (Maul et al., 2016)

5. Form and Function of Language

Frost and Bondy (2006 p.104) point "Skinner developed the study of operant behaviors-behaviors defined by their impact upon the environment rather than by their form." Skinner 's account has created a potentially pragmatic way to teach language and discuss impairment. It provided scientists and practitioners a taxonomy for the classification of language units, as well as a systematic method for evaluating and, most importantly, modifying language. (LaFrance & Miguet, 2014) Formal features include the topography of the verbal response (i.e., form, structure), and functional features are the cause of the response. Both elements must be taken into account for a full account of language. Skinner said "It is important in the study of language

to distinguish between the formal and functional properties of language." (as cited in Sundberg, p.527, 2007).

A. Form

The field of structural linguistics focuses on the topography or the form of language characterise by Phonetic: is the properties of sound, how speech sounds are produced, perceived and how the can be analysed acoustically whereas, phonology investigates the principles governing the sound systems of particular languages and language in general and the pattern of sounds. Also, morphology: seeks to define how words are built and syntax is the study of sentence structure and word order. Add to that semantic: investigates the meaning of words and sentences, in the opposite to, pragmatic that identifies the use of language and its effect. Grammar (conventions or rules) Lexicon (collection of words) (George Yule, 2010)

Moreover, Sundberg (2007, p. 527) said, "The formal description of a language can be accomplished also by classifying words as nouns, verbs, prepositions, adjectives, adverbs, pronouns, conjunctions, and articles.". Some elements of the formal description of the language include preposition phrases, clauses, modifications, gerunds, tense markers, particles, and predicates. Sentences are then composed of the syntactic arrangement of the lexical categories of speech with adherence to the grammatical norms of a given verbal community. Other formal properties of language also include articulation, prosody, intonation, pitch, and accentuation. Language also can be categorized without the involvement of a speaker or without any knowledge as to why the speaker said what he did. Sentences can be analysed as grammatical or non-grammatical from a text or clip recorder. For example, incorrect use of word tense can be easily identified from a child's recording that says, "Juice all gone." (Sundberg, 2007)

B. Function (verbal operant)

Sundberg and Michael (2001 p.701) mentioned that:" The unit of analysis is the functional relation between a type of responding and the same independent variables that control nonverbal behavior, namely, motivative variables, discriminative stimuli, and the consequences that have followed that type of responding." Skinner viewed this unit as a verbal operant, where the operator means a form or class of behaviour as distinguished from the respondent and referred to such units as a verbal repertoire in a single individual. (Skinner,1957, pp. 19-22). In defining these operants, he developed new terminology to describe these functional relationships to reduce confusion with lay terminology or vocabulary. (Sundberg, Michel 2001)

Sundberg (2007, p.527) argued that one widespread misunderstanding about Skinner's verbal behaviour approach to language is that he dismissed the structural linguistic classification of language. Nevertheless, he found no lack of ability in classifying or describing it. But instead lacking to account for the "cause" or classification functions. (analysing how and why ones say a word). Also, LaFrance and Miguel (2014) mentioned that verbal behaviour represents, nevertheless, a movement away from the traditional perspective that takes for granted that language is an independent entity and that all communication is merely a transmission of ideas. On the other hand, the net result is parsimonious yet powerful measures when language is developed and treated like all other behaviours; these contribute necessarily to an effective and efficient language intervention also, enable people with language deficiency to communicate meaningfully and with awareness.

6. Speaker and Listener

The concept of verbal conduct clearly distinguishes between speaker behaviour and listener behaviour. Sundberg (2007, p. 529) said: “Verbal behavior involves social interactions between speakers and listeners, whereby speakers gain access to reinforcement and control their environment through the behavior of listeners.”

In comparison to other language approaches, Skinner 's verbal behaviour is mainly concerned with the behaviour of the speaker. He avoided terms such as expressive language and receptive language due to the fact that they are simply separate representations of the same basic cognitive processes. The listener must understand how to reinforce the verbal behaviour of the speaker; ensures that listeners are encouraged to respond to words and communicate with speakers. It is necessary to educate the child to respond correctly to the verbal stimulus presented by the speakers and to behave verbally as a speaker. Skinner also states that the speaker and listener play various roles in verbal discourse and have to be analysed separately. The key to Skinner's (1957) functional study of speakers’ behaviour is the distinction between the echoic, mand, tact, and intraverbal. These four types of verbal behaviour are traditional all grouped into an “expressive language”. Skinner indicates that the expressive classification system incorporates significant differences between functionally independent language forms. Skinner also demonstrates textual, transcriptive, and copying-one-text relations in addition to these four main verbal operators. As Skinner terms them, "elementary verbal operators" are seen as separate functional units that form the foundation of advanced verbal (language) skills.

(Sundberg, 2007 & 2016, Sundberg & Michael, 2001). (Listening behaviour is also important but it will not be conducted in this research).

Sundberg (2016) revealed that for some cases learning any type behaviour will make it easier to learn others, but that needs to be acknowledged as a motivational process, an antecedent stimulus, responses, and consequences, instead of, learning the meaning of words as listeners, and then using them as a speaker in various ways. Then let's discuss the mand, tact, echoic, and intraverbal, as well as the different control sources that define these types of verbal behaviour.

7. The Primary Verbal Operants

Verbal behaviour (VB) focused on the acquisition of functional language skills. Skinner (1957) has classified verbal behaviours into core functional units named them the verbal operant, such as mand, tact, echoic, and intraverbal. Chapters 3 to 7 of the Verbal Behaviour book written by Skinner (1957) distinguished between these several different types of verbal operants. Technical definitions and examples of each elementary verbal operant are provided in Table 02.

Table 2: *Verbal Operants*

Mand	Asking for reinforcers that you want. Saying *shoe* because you want a shoe.
Tact	Naming or identifying objects, actions, events, etc. Saying *shoe* because you see a shoe.
Echoic	Repeating what is heard. Saying *shoe* after someone else says *shoe*.
Intraverbal	Answering questions or having conversations in which your words are controlled by other words. Saying *shoe* when someone else says, *What do you wear on your feet?*

Note. Retrieved "Verbal Behaviour " by M. L. Sundberg, 2007, Journal Title, Volume(issue), page (529). Copyright 2006 by The Behavior Analyst Certification Board, Inc., (BACB).

A. Mand

Skinner (1957) coined the term" mand" for this type of verbal relation because the term is conveniently brief and is similar to the plain English words "command," "demand," "countermand," "repri**mand**," and "**mand**atory." (Sundberg, 2016 p.12)

Skinner defined mand as" verbal operant in which the response is reinforced by a characteristic consequence and is therefore under the functional control of relevant conditions of deprivation or aversive stimulation." (Skinner 1957, pp.35,36) These "relevant conditions" are today's

motivating operations. Sundberg 2007) explained that the mand is a verbal operator for whom the motivation operation and specific reinforcement functionally governs the form of a response. For example, if food deprivation has been used in the past by saying “cookie” to generate cookies being delivered, food deprivation is successful as a reinforcement and revocation activity as a mand "cookie." As demonstrated in Table 03.

Sundberg (2016) explained that the mand is a kind of verbal behaviour where words, signs, or icon exchanges are regulated functionally by motivational operations (MOs) affecting the speaker. In other terms, the speaker delivers words requesting a thing or action or not. For instance, when a child needs milk for his cereal that is missing, he may ask for milk that is lacking. The word "milk" is controlled mainly by motivational operations that is related to cereal consumption. Skinner terms the reinforcing of the mand "specific reinforcement" so that the reaction determines the motivator and the results are specific to that motivator. Also, the same child may ask to "up" if the child has completed eating and wants to leave the high chair this mand is on aversion removal (a mand regarding removing an aversive). Maul et al. (2016, p. 36) added that the precedent of a mand is a state of motivation caused by deprived conditions or exposure to aversive stimuli. A special characteristic of the mands is that they typically state the desired reinforcement “(what do the speaker want the listener to provide or do)”. As a consequence, the listener frequently responds in a manner that confirms the verbal response of the speaker. (Maul et al, 2016, p. 36) Mand's typical effects include receiving the item (positive reinforcement) or removing aversive stimulus (negative reinforcement). Table 03 provides examples of mands along with the antecedents and the consequences.

Table 3: *Mand*

Antecedent	Behavior	Consequence
Hunger (deprivation)	Child says, “I want a cookie.”	The child receives a cookie (positive reinforcement)
The child wants a toy ball (deprivation)	Child signs “ball.”	The child receives the ball (positive reinforcement)
One child is feeling threatened by another child (aversive stimuli)	The first child says, “Go away!”	The *threatening* child goes away (negative reinforcement)

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Maul et al. (2016) explained that environmental factors may also influence mand production and can contribute to the historical event that provokes a specific mand, for instance, if the person feels cold (an aversive stimulus), environmental factors may influence whether they ask (mand) for a jacket or tells someone to turn on the heater.

Skinner said “Mands are very important for the early development of language, and for the day-to-day verbal interactions between children and others. Mands are the first type of communication acquired by a child “(as cited in Sundberg 2016, p.12) The earlier uses of mand often arise when the child is starving, sleepy, ill or afraid, or needs social attention or toy they transmitted (translated) their needs as crying, scream or eye contact. When a baby grows up, crying and eye contact may also be used as a mand instrument to request for a toy or help or for the avoidance of aversive stimuli to shift of objects and people. After typically developing children will learn to replace cries with language or other forms of communication. Manding not only allows children to monitor the transmission of reinforcers, but it also begins to identify speaking and listening positions that are necessary for further language development. (Sundberg, 2016)

Skinner (1957) states that the mand is the only verbal behaviour that benefits speakers directly, that means that the mand gets the speaker what he needs such as food, toys, movement, attention, or aversive stimuli removal. As a result, mands often become strong forms of verbal behaviours through specific reinforcing, often satisfies an immediate deprivation or removes aversive stimulus. Moreover, mands would become high forms of verbal behaviour since they fulfil a child's immediate need. Children often have a high rate of manding due to these special effects. Consequently, a child learns to mand for several different reinforcers, particularly requesting verbal information using words like "what," "when," and "where" and the child rapidly acquires new verbal behaviour. (Sundberg,2016)

Maul et al. (2016) added “Mand make up many of everyday behaviour, when a child realises that he or she can obtain a desired item or an action by acting in a certain way, the foundation for commination is established.“ Throughout the process, mands become very complex and plays a significant part in social interaction, communication, academic activity, workplace, and practically all human behaviour. The essence of the current mand repertoire is probably one of the most important keys in identifying a child with autism. Given the role of the mand in the typical language development and the relationship with problem behaviour where a child is unable to express the needs, an assessment of a child's present capacity of mand repertoire can

reveal several clinical problems. (Sundberg 2016)

B. The Tact

Skinner defined tact as" verbal operant in which a response of given form is evoked (or at least strengthened) by a particular object or event or property of an object or event. (skinner, 1957p. 82)." LaFrance and Miguel (2014) and Sundberg (2016) says that tact is a verbal operator regulated by a pre-existing entity, object, action, or properties that are nonverbal, reinforced by a general form of reinforcement at least during the learning of this behaviour. For example, labelling objects in the environment, a child can see a glass of water (nonverbal stimulus) as he or she learns to mark items in their setting and say 'water,' so it could be accepted in some way. Sundberg, (2016, p.13) said: "The tact is a type of language where a speaker verbally identifies things, actions, attributes, etc. in the immediate physical environment…verbal operant under the functional control of a nonverbal S^D and it is followed by generalized conditioned reinforcement. The speaker has direct contact through all of his sensory modes with these nonverbal stimuli. This form of linguistic comportment is known as tact, for example, if the child said "Dog," as he saws the dog, but he does not want the dog it is considered a tact. And, if a child feels a dog in the dark and says "dog," it would also be called a tact because the preceding stimulation is nonverbal.

Frost and Bondy (2006) (Sundberg 2016) pointed out that Skinner selected the term "tact" form the word contact meaning the verbal behaviour is evoked by making direct contact with the speaker's physical environment. For example, a ball could be a particular object in the environment. A property of the ball would be its colour or its size and the event in the environment would be the bouncing of the ball a property of the bouncing would be bouncing quickly or slowly or high or low the consequence for the tack would be social or educational. What we see with young typically developing children is that they will see or hear something interesting get mom or dad's attention and then mane the item or even the do this purely in order to get that social reaction form mom and dad. The tact association is closely associated with many language training programs for children with language retards with what is commonly known as "expressive labelling."

The antecedents for tact are discriminatory environmental stimuli (events, people, or objects) that the speaker would like to name. The consequence of the tact is secondary reinforcement (social reinforcement); consequently, listeners or audiences are critical. Typical social reinforcements may include a head nod, a smile, or an expression of the agreement of the

listener. Increased attention on the part of the listener can also be socially reinforcing. (Maul et al, 2016)

Table 4: *Tact*

Antecedent	Behavior	Consequence
The child sees a ball or a picture of a ball	Child says "ball"	The listener responds, "Yes, that's right!"
The child sees a very large dog	Child signs "big dog"	The listener responds, "Wow, that is a big dog!"
The child hears a dog barking	Child says "doggie barking"	The listener responds, "Yes, I hear it too."

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Sundberg (2016) mentioned, in a child's environment, there are several nonverbal stimuli that a child ultimately needs to learn to tact. The first tacts that children obtain (e.g. Mummy, ball, kitty, car, cup, book), frequently contain toys, common home-grown things, pets, and kids' items. There are various types of nonverbal stimuli. They may be nouns, verbs, relations between objects (prepositions), object properties (adjectives), action properties (adverbs), etc. It can also be simple like a shoe or complex like a cancerous cell. Add to that, there can be many nonverbal properties (e.g. colour, size, location) to a stimulus configuration, with the response being regulated by these various properties, as in tact: "A red fire truck underneath the table." Nonverbal stimuli may be observable (e.g., a car) or unobservable (e.g., pain), subtle (e.g., a wink), or salient (e.g., neon lights), or have common characteristics of different nonverbal stimuli (e.g. colour, size). Since nonverbal stimuli in the physical world differ and are universal, tact is no surprise in language studies (Skinner, 1957).

C. Echoic

All children who acquire speech must use it. Skinner describes this as "verbal behavior is under the control of verbal stimuli, the response generates a sound-pattern similar to that of the stimulus… resulting in a generalized conditioned reinforcer." (Skinner 1957, P. 55) in this case, the sounds that I make are similar in form to the sounds that you have made. Several studies (LaFrance & Miguel 2014, Sundberg 2007, Maul et al, 2016) defined echoic as a form of verbal

operant that takes place when a speaker repeats the verbal behaviour of another speaker. is composed of a verbal operator under previous vocal influence stimulus that is identical to the response. The echoic response is reinforced, like in tact and intraverbal, through some generalized reinforcement such as praise and attention. An individual may say "hello" to another individual who walks by, to whom this transitional may respond "hello"-verbal stimuli that take the same form and maintain certain types of socially mediated reinforcement, such as the reaction or the smile of another person. Another example, after listening to the mother's term, a child who says "cookie" is echoed. Echoic is also the repetition of other people's voices, phrases, and sentences, common in everyday speech. The echoic operant is controlled by a verbal discriminatory stimulus with a point-to-point correspondence and a formal resemblance to the response. Point to point interaction between the stimulus and the response or answer product takes place when the beginning, middle, and end of the verbal stimulus corresponds to the start, middle, and end of the response.

The ability to mimic or echo other people's verbal behaviour (phonemes and words or phrases etc..) is essential for learning to identify objects and actions. One parent might ask, "It's a ball, can you say ball? "If the child could answer" bear, "the parent would say " Yes!" after, without a prompt echo, the child learns to mane(tact) a ball. It also happens in a couple of simulations. If the child is able to say "ball" when the parent says "ball" for example, in the presence of the picture of a ball or a ball in real life, it will be possible to teach that child is a "bear." In children with language delays, the echoic repertoire is very important and plays a vital role in teaching complex communication skills. (Sundberg, 2007)

Table 5: *Echoic*

Antecedent	Behavior	Consequence
The child hears the word “ball”	Child says “ball”	The parent responds, “That’s right!”
The child sees someone sign, “He has a blue shirt.”	Child signs “blue shirt”	The parent responds, “Yes”
A parent says, “Mmmm . . . this pizza is yummy!”	Child says “Yummy!”	The parent smiles and nods, indicating he knows the child agrees

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Skinner (1957) describe what the echoic is not and said: “Echoic behavior is easily confused with responses which are self-reinforcing because they resemble the speech of othersheard at some other time…. verbal stimulus of corresponding form does not immediately precede it.”(Skinner 1957. P. 58) repeating sounds words that may be self-reinforcing for instance playing with your voice is not verbal behaviour because no one else is manding or reinforcing. Also repeating a word heard before (in time, there is no immediately preceding stimulus) so the sound made is not echoic.

Motor imitations may have the same verbal properties as echo behaviour as expressed by their character in the acquisition of sign language by children who are deaf. For instance, a child can first learn to imitate the cookie sign and then mand it without an effortful command. For the many children who have a poor echoic repertoire, time is spent teaching moto imitation rather than more productive types of verbal behaviour. A strong imitation repertoire enables a teacher to immediately use Sign Language to teach advanced language forms mand, tact, and intraverbals). This helps a child to easily learn how to communicate with others. (Sundberg, 2016)

D. Intraverbal

Skinner defined interverbal; as “…responses under the control of audible or written verbal stimuli supplied by another person or the speaker himself…”(p.55) showing “no point-to-point correspondence with the verbal stimuli that evoke them…”(p.71) and reinforced by a “generalized conditioned reinforcer…”(p.53). Intraverbal is a verbal behaviour produced as a consequence of other verbal behaviour, but not similar in form to the previous one. It is a type of language where the speaker responds verbally (including sign language) to the words (or signs) of others or he can also respond to his own words. In addition, intraverbal practices include talking about non-existent things, events, and activities. For instance, to answer questions such as, "Last night, what were you doing? "Or what's your favourite sport? "It's an intraverbal behaviour like saying" spoon "when someone says" knife, fork, and ... "it's also an

intraverbal behaviour. Many intraverbals are simpler and consist of more repetitive verbal actions, since they have been established as a unit. If a speaker says "salt and ..." a hearer can add the intraverbal "pepper" to the phrases. See Table 06. (Sandburg,20016; Frost & Bondy,2006; Maul et al, 2016)

Technically speaking, an intraverbal is a type of verbal operator, that is under the influence of a previous verbal stimulus and whose response does not match the preceding stimulus. Once the verbal behaviour evokes a verbal response that does not correspond to the verbal stimulus point-to-point. Meaning, that the verbal stimuli and verbal response do not match as in the echo. The intraverbal produces a generalized conditional reinforcement, like any other verbal operator (except mand). Maul et al. (2016, p. 42) say “Therefore, the antecedent for an interverbal is an immediately preceding response. The consequence for interverbal is social reinforcement that may be overt or subtle” In the beginning, the intraverbal response is reinforced by a general form of reinforcement. For instance, an adult may ask a child what your favourite animal? and the child may answer by identifying any animal within his / her vocabulary. The adult's initial question evoked the child's answer, but neither Verbal behaviour (language) adult or child was identical to the other. (LaFrance& Miguel 2014, Sandburg 20016)

Intraverbals emerge early in development as a response to the verbalization of others. As the child's verbal repertoire develops, there may also be intraverbal reactions to the child's own prior verbalizations. Typically developing children offer high-frequency intraverbal responses in the form of singing songs, telling stories, describing activities, explaining issues, and so forth. They often learn history, science, and maths facts as intraverbal responses. The intraverbal reaction is also an important aspect of other intellectual behaviours (e.g. when asked 'What needs a plant to grow? The answer would be “water, soil, and sunshine, “or when it says 'five and five equal “ten” consequence of learning. The intraverbal repertoire is limitless. Typical adolescents and adults have hundreds of thousands of intraverbal associations in their language repertoire and may produce thousands of them every day. (Frost & Bondy,2006; Sandburg 2016)

Table 6: *Intraverbal*

Antecedent	Behavior	Consequence
The listener says, "salt and . . ."	Speaker says "pepper"	The listener responds, "That's right!"
The child recites to himself, "Columbus sailed the ocean blue . . ."	Child continues, "in 1492"	The child is reinforced by completing the rhyme and remembering the fact accurately
A teacher asks, "Why are you late?"	The student says, "because I had car trouble"	The teacher responds, "I understand."

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Sandburg (2016, p. 15) said: "A high percentage of children with autism fail to acquire a functioning intraverbal repertoire." There are several reasons for this, but one avoidable factor is that the intra-verbal relation is not assessed as a distinct verbal ability and is taught accordingly. It is often assumed that intraverbal skills, such as mand, will simply develop from tact and listening skills training. Usually, by the time a child's conversational, social, and verbal abilities are defined as poor or impaired. Barriers have been formed, such as direct control, rote reaction, or negative behaviour make it difficult to establish a functional intra-verbal repertoire. Typical children will develop intraverbal behaviour following its acquisition of solid mand, tact, and listener repertoires. For certain children, the development of intraverbal behaviour can be detected at about the age of two. Many of the early intraverbal relations such as songs, animal sounds, or intraverbal associations and relationships of one and two words are quite simple. More complex intraverbal answers, for example, answering multiple questions on components, will not normally take place with typical children until around three or four years of age. (Sandberg 20016; Sundberg 2011)

LaFrance and Miguel (2014) explained in the teaching of verbal operators, language interventions developed by taxonomy Skinner (1957) have proven to be highly effective. This model focuses on the function instead of the type of spoken word and emphasizes the importance of context (verbal operators). That verbal operants must be learned as the language

develops to achieve a proper basic vocal / linguistic repertoire. The work of Skinner has significantly affected the way language skills are taught. Through focusing on meaning and purpose, Skinner's taxonomy has provided behaviour analysis as a powerful tool for the teaching and development of language, in particular where the repertoire is significantly affected. The acquisition of any form of the verbal operator (e.g. tact) does not automatically result in the acquisition of any other verbal operator (e.g. mand). It means that learning to say cookie doesn't automatically mean a child will ask for a cookie when he or she needs it, as when a child is when he/she sees a cookie. We will experiment with these verbal operant and testify their intervention to language development also, see if the children with autism spectrum disorder's language repertoire will significantly improve.

In this chapter, we will provide a practical implementation of the verbal behaviour approach to children with Autism Spectrum Disorder where we will experiment with their linguistic ability. To testify the validity of this approach we compared it to group children with autism spectrum disorder (ASD) that have been exposed to the traditional approach. Going through the protocol of both approaches during 9 months. After collecting the result from both approaches, following this, the finding will be dissected.

1. Aim

The aim is to evaluate children with Autism Spectrum Disorder's (ASD) language ability by identifying their linguistic strengths, deficient and the gaps in their language development. Through, collecting and collating information based on descriptive statistical analysis and applying a treatment approach to demonstrate that language develops in a systematic manner using the verbal behaviour approach (VBA).

2. Methods

A. Participants

The participants of the study were 40 children with Autism Spectrum Disorder (33 boys and 7 girls), ranged in age from 4 to 9 years. 20 Children were recruited from the Public Health Institution in Mostaganem where we applied the verbal behaviour approach (VBA) and the other 20 from Mental Handicap Association, the Children's Center in Mostaganem where we used the traditional approach (TA) of teaching language between (Novermber-2019) and (august-2020). All children assigned a diagnosis of ASD based on meeting the criteria of autism on the Childhood Autism Rating Scale–Second Edition (CARS2), as well as, meeting the criteria on the Diagnostic and Statistical Manual of Mental Disorders (DSM-V). Based on DSM5 criteria participants were marked with autism level 1 and level 2. Children's linguistic ability was tested using The Verbal Behavior Milestones Assessment and Placement Program, where all children at the beginning of the experiment were marked with minimally verbal (only producing sound or from 1 to 5 words). Additionally, a typical developing age-matched controlled group was not needed because the VB MAPP includes an aged sample. Tables 7 and 8 provides details of the participants.

Table 8: *Participant for group 1 VBA*

Participant 01	age	level
average	5.6	1.45
standard deviation	1.187656	0.510418

Table 7 :*participant for group 02 TA*

Participant 02	age	level
average	6.55	1.35
standard deviation	1.316894	0.48936

B. Materials

The material of this research was the language assessment tool The Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP). VB-MAPP is a criterion-referred assessment tool, program guide, and ability tracking system designed for children with autism and other individuals with language delays. The VB-MAPP program is based on Skinner's (1957) analysis of verbal behaviour, formed developmental milestones, and research in the field of behavioural analysis, developed by Dr. Sundberg (2008). It is the most up to date verbal behaviour-based assessment tool. The VB-MAPP provides more information on language level and communication for an individual child than the frequently used standardized language assessment. (Esch et al., 2010).

VB-MAPP Milestones Assessment: aimed at providing a representative sample of the child's current verbal and related skills. The assessment includes 170 measurable learning and language milestones that are associated and balanced across 3 developmental levels (0-18 months, 18-30 months, and 30-48 months) of typically developed children (that are developmentally matched to typical children.). The skills assessed include mand, tact, echo, intra-verbal, listening, motor imitation, independent play, social and social play, visual perception and match-to-sample, linguistic structure, group and classroom skills, and early academics. The overall results of the VB-MAPP will include valuable information that will guide the development of effective, individualized language, social skills, and learning programs. 5 items and 5 points for each skill area. Each item scored as a 0, ½, or 1 based on criteria in the protocol. Totals for each skill area are added for all three levels and placed on scoring form out of 170. A sample of a VB-MAPP Milestones assessment scoring form is presented in Figure 3. This is the score for participant 03, a six-year-old boy with autism who has no functional speech. His overall score for the VB-MAPP Milestones Assessment (November 2019) is in the Level 1 range, as indicated by a score of 27.5 out of 170. This puts his language skills around the age of development at 0-18 months. His comparative scores

across domains are out of balance with each other, suggesting that certain skills are much better than others. His main strengths are in the areas of visual perceptual and match-to-sample abilities, motor imitation, echoic, vocal, while his deficiencies are in the areas of mand, tact, and listening skills (are the key domains of early language development). Participant 13 VB-MAPP shows that a range of language skills required intervention and development. For example, its profile would indicate that an intensive intervention program would be implemented, with the goal being to build a functional mand repertoire as well as to target tacts, listening skills, and social skills. His abilities in matching-to-sample, motor imitation, and echo domains can be used to teach mands, tacts, listeners skills, and social skills.

Figure 3: A sample of a VB-MAPP Milestones assessment for participant 02.

The reasons behind choosing VP MAPP as a language assessment in this research because it corresponds with Skinner's classification of the verbal operants (echoic, mand, tact,

intraverbal). The VB-MAPP will help to identify linguistic strengths and deficiencies the gaps in language development, as well as, the general and specific language level compared with typically developing peers of the same age. The VB-MAPP will guide the order of teaching skills. The evaluated results are related to specific ages, and that provide an understanding of the development of the child compared with the typical age norms. The VB-MAPP can be used to direct the intervention program and ensure that each verbal operant is established systematically. For example, if a child acquires listener skills, but not tacts, tact training will become an important part of his training. Or, if he can tact, but not mand, then the mand training should be included in the program. At the end of the day, all verbal operants need to be established and fairly balanced. Feather more, the general results of the VB-MAPP provide valuable information as a guide to the development of more effective language skills and social skills. (Sundberg, 2008)

C. Procedure

The current study was based on the first group (G01) (N;20 participants) where we applied the verbal behaviour approach and taught the 20 participants (mand, Tact, echoic and, intraverbal). Whereas, the second group (N;20 participants) used the traditional approach for teaching language. The Verbal Behavior Milestones Assessment and Placement Program (VB MAPP) was used as a language assessment to examine the progress in each area across nine months. All participants were examined using the VB MAPP in 3 different periods. At the beginning, we assessed all participants language levels using VB MAPP and we used the result of the first group (G 01) as a baseline to start the treatment (experiment). In March 2020 VPMAPP was applied again with all the participants where we recorded the scores for the skill. Finally we applied the test again in August to track mastered skills for each domain. So, overall, the measurement of the progress in language and communication skills was conducted three times for nine months. The result of each participant and how we collected data would be included in the appendix.

3. Experimental procedure

A. Group 1: verbal behaviour approach

Participants from group 1 were recruited from the Public Health Institution in Mostaganem. It is a public medical center that consists of speech pathologists and psychologists where they take care of children with autism and other mental disabilities. Treatment consisted of

participants attending a tracking assessment session with their parents at the clinic every two weeks. Participants attended an hour speech session to develop their language skills along with a psychotherapy session to deal with their behaviour. We worked in correlation with the parents where they attended phycological session (usually the mum) to develop their awareness about autism where, they were taught how to deal with an autistic kid and we informed about the program and ask to complete it (most of the time asked to work on generalization), generalise the skills learned in the speech session in the natural environment to maintain the skills learned. Speech session took place at the table, Figure (4) were the Verbal behaviour was introduced at the paying area Figure (5)

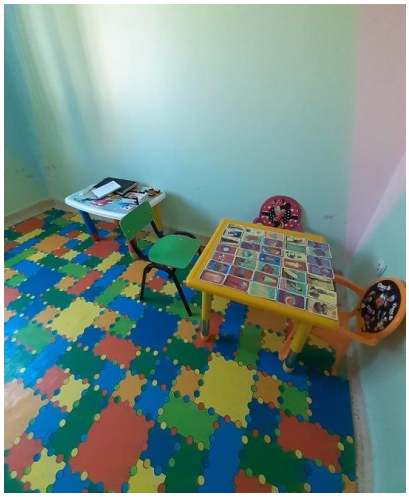

Figure 4 : Playing area

Figure 5 :Table area

For group 1 treatment experimental procedure consisted of two parts: before vocalization training and vocalization.

1). Before vocalization

a. Pairing and eye contact

Pairing, beginning with the learner on the first day and continues with it every day, is ongoing progress. Pairing is done during the day and it is an important component to establish instructional control (only through playing with them). Next, eye contact (smiling) and eye control. We used a range of approaches to promote and improve eye contact. Which can include improving the normal and spontaneous nature of eye contact and increasing the duration of eye contact during a conversation. Once we implement a new skill, it's important to teach it in gradual measures, while slowly progressing your expectations as the learner progresses. We

began engaging in eye contact in informal and private situations. The first step is to pause until the learner responds. So that if he/she asks for something, pause before answering or offering it to him. It could be enough to encourage him to turn in your direction and see if you've noticed him. When he does, he will respond automatically and after praise him for making eye contact. This could be so plain as to say, "I like how you look at me," or just "Good looking." The next step is to work up the duration of eye contact by asking the learner to keep an eye on you and wait a few minutes for what he wants by elling the learner during this break, how his interaction with the eye helps you to answer his requests.

We used error-less teaching procedure for the learners not to get frustrated for making mistakes. The therapist would prompt their response if a mistake is made in the process by correct it and start over again. Listener behaviour allows the learner to listen and respond to a stimulus correctly. It allows a child to pay attention to what is being said. Before we start working on verbal operants, we need to make sure that our learners will follow our instructions, for example, come here, sit down, fold your head, walk with me, pause, wait ,and have these essential skills. Because most vocal training is done at the table-time. Learners who need to acquire receptive language skills would greatly benefit in the process of developing verbal operators. The teaching procedure for the listener's behaviour is done by the therapists providing instructions for certain desired task, in other words, as the learner is about to do something the therapist gives them instruction and make the learner experience this contingency for a multiples times before moving on to develop the verbal operants. For example, given them instruction or how to do a certain activity (game) as shown in figure 6. The teaching procedure for the listener's behaviour is also done through matching the sample activity where the therapist places four pictures for certain items on the table and says: show me "banana" and immediately point to the banana picture. The therapist then will fade the pointing prompt. After, the therapist re-arranges the layout of the pictures and says, "Give me a banana" and wait a few seconds for the learner to respond. The learner then touches the picture banana and then therapist will reinforce by saying good or well done. As demonstrated in Figure 7.

Figure 7: Fallow game instruction for listening activity.

Figure 6: Matching the sample for listening activity.

b. Motor imitation

We teach motor imitation to the learner who faces trouble imitating actions. Learners need to know how to imitate simple actions before they can learn to complicate ones. The therapist needs to show the action to the learner then they will imitate that action. We start with the verbal stimulus where the therapist sits in front of the learner and attracts his attention, wait for eye-contact, and says do this (moto action) for instance, tapping the table or clap, here the therapist will use a full physical prompt means do it for the learner. After a multiple of trails, the therapist will then fade the prompt where they say “do this” meaning moto action and wait for the learner to respond by taping the table or clapping, the therapist then reinforces the learners’ action by saying good job (generalized reinforcement), Motor imitation builds up the road to develop echoic behaviour because motor imitations have the same verbal properties as echoic behaviour. Therefore, for children who have a poor echoic repertoire, time is spent teaching motor imitation and this will help a child to easily learn how to communicate with others.

2) Vocalization:

a. Teaching echoic

Imitating verbal sounds is the first step to speak. When a child can echo back a sound or a word, before beginning to tact or mand, therefore the ability to repeat words when asked to do so plays a significant role in the production of other verbal operants. Since many children with autism are unable to emit echoic behaviour, special training techniques are required to improve the echoic repertoire. The first purpose of echo training is to encourage the learner to repeat words and phrases provided at the request of parents and therapists.

We begin with direct echoic training with vocal stimulus. The approach involves a mixture of methods form prompting to shaping to fading and reinforcing. First, the therapist's usage prompts such as pointing towards the mouth for the learner to feel excessive movement and demonstrate physical lip prompting by uses a mirror to make the learner watch the lips movement. Then, the therapist will fade the prompts and pure echoic responses are reinforced. These procedures are efficient for many children to establish and reinforce echoic control and articulation. (facial massage is added used when needed).

Children with a low level of vocal production can find it difficult to develop echoic behaviour. These children's treatment starts with primarily enhancing vocal activity. The procedure is to specifically reinforce all verbal behaviours. Thus, if the child emits a particular sound at random, the therapist reinforces this behaviour and conduct an echo trial with that sound and shaping it immediately after the reinforcement has been delivered. then, wait for the learner to repeat. Once echoic control is initially established, then the aim is to develop a wide repertoire in which a child could repeat new words and sentences. We when through the alphabet sound, the animals sound, food (vegetables, fruits, and cereal), people, clothes, transportation, pets, and animals' colours and shapes with the help of games Figure 8 and 9. Next, we moved on to verbs associated with the masculine and feminine, furthermore, subject, propositions, and adjectives. We start with one-word then moved on to 2 words phrase. With the help of picture card (flashcards) by presenting each card at a time as demonstrated in figure 10. After we made sure that the children will maintain this skill which was the duty of the parents. We made sure that the parent repeats what was taught at the table time.

Figure 9: Pictures of card for different items.

Figure 8: Teaching colours with the help of game.

The ultimate purpose of echoic, however, is to pass the response to other verbal operators (tact, mand, and intraverbal). Placing an echoic trail within a mand frame can often be more effective for maintaining an echo stimulus control, because, the mand behaviour's motivation is strong and can be used temporally to develop the echoic behaviour. For example, if the child shows a strong motivation for the game, an echo trial will be performed when the motivation is high in the presence of a non-verbal stimulus which is the game. After the mand, prompt must be faded, and the reinforcement changes from the specific reinforcement (receiving the object) to generalized conditioned reinforcement (therapist saying "good job"). For some learners, shifting from motivation to echo control may occur more easily if an image of the object is used rather than the real object itself. When a child can emit a word under an echo stimulus control, a transfer to stimulus control procedures can be used to bring the same response form under control stimuli such as naming objects (tact) and answering questions (intraverbal).

Figure 10: flash cards

b. Teaching a tact

In tact the antecedent here is a nonverbal stimulant (picture or object), the behaviour is the tact (labelling the picture or the object), and the consequence is generalized reinforcement which turns into verbal praise. The learners are given cards with various pictures on them. They are asked to tact(label) each photo. By doing so, we are building a foundation for communication skills. Labelling object, action, property anything that in the environment is one of the first steps that can lead to an intraverbal and mand behaviour. The teaching procedures aim to bring a verbal response under non-verbal stimulus control. When a child has a good echo repertoire, then tact training can be very easy. The child learns to tact objects, actions, properties of objects and actions, prepositional relations, abstractions, private events, and so on.

In the beginning, the therapist presented a non-verbal stimulus along with an echo prompt and then fade the echo prompt. The therapist presents an object or a picture with an echo prompt "ball" and then waits for the answer "ball" as shown in Figure 11. The next step is fading the echo prompt and bringing the answer under the full influence of the non-verbal stimuli. The therapist will fade the echo by displaying the object or the picture and saying "what is it? "and then wait for the learner to answer "ball". After the therapist checks if they are able to retain this skill over a couple of trials. As with echo training, a transfer occurs more rapidly at this stage in the process where the picture of the object is used rather than the real object. With some children, the tact training is more complicated and special techniques may be required. For instance, a mand frame may be used to develop tact. The procedure is similar to that defined for teaching echoic behaviour. Training begins with a motivation for the desired object (non-verbal stimulus) and an echo prompt is used. After, the therapist aim is to free the response from motivational control by presenting generalized conditioned reinforcement (the therapist saying "well done") rather than specific reinforcement (delivering the object).

Going to the next stage to teach more complex tact will allow the usage of the transition of stimulus control. For example, the teaching verbs introduce f a non-verbal stimulus of movement and a response such as a "jump" to be put under the influence of the jumping activity also, it can be demonstrated by the usage of pictures at the table as presented in Figure 12.

Figure 11: flash card of a ball.

Figure 12: flashcards depicting verbs.

Teaching tacts including prepositions, adjectives, pronouns, adverbs, and so on also requires the development of non-verbal stimulus regulation. The more complex is the verbal behaviour under the control of private stimuli, such as those involved in emotional states (sad, happy, scared, pain, itching, full bladder, hunger, etc.) these control variables that affect the learner

cannot be directly contacted by the teacher or the parent, where it is difficult to develop accurate tact behaviour. The therapist cannot present the appropriate private stimuli within a person's body and thus cannot reinforce the right tact responses in the same manner as the correct tact of the objects and actions are reinforced. Teaching the child to accurately say "happy" the therapist presents a picture of a child smiling in showed in Figure 13.

Once tact control is initially established, the aim is to expand their vocabulary were children can tact new words and phrases. We started with one-word, then move to two words phrase, then sentence. We when through labelling food (vegetables, fruit, and cereal), people, clothing, transportation, pets, and animal colours and shapes Figure,11, 12, 13, and 14. Then, move on to verbs, subject, proposition adjectives. Property of objects, prepositional relations, abstractions, private events, the masculine and feminine association also tense (past and present). After that, we had to make sure that the children would maintain this ability which was the role of parents. We made sure that the parent would repeat what was taught at table time by generalising these skills to the natural environment. We made sure that the parent would tact the words used in the natural environment. Also, to increase the probability of tact behaviour will have to generalise this behaviour. For instance, when a child was taught the verbal behaviour “car” this behaviour (word) is being reinforced by generalisation requiring the parent to present to the child a variety of different types of car (car, pickup, van, and truck), colours (red, blue, silver and black) and even different sizes (small, medium and big).

Figure 13: flash cards of verbs and facial expressions

Figure 12: teaching colours using games

c. Teaching the mand:

Verbal behaviour starts with instruction mands, as the key language form. Mand makes students understand how communication appears to work. A student can get what he or she wants without a breakdown using words. Among the verbal operants mand is the only one that truly

benefits the speaker. Whenever mand is not typically performed, we need to monitor the environment because negative behaviour will develop such as crying, violent acts, social isolation, or self-injury form the child to serve the mand purpose. Most autistic children would just yell and scream any random word at the thing they want when they first began the treatment (therapy) and if they didn't get the material, would throw a tantrum. The mand enables a child to get what he wants and when he wants it. Mand training is complicated by the fact that the response must be functionally controlled by the relevant motivation. Mand training can, therefore, be carried out only when the relevant motivation is strong. Before teaching mand we must know what, motivates the learner and when that motivation is strong?. To figure out what motivates the learner, we exposed them to a lot of different things (toys/ video games, puzzles, food) in Figure 15. Watch the child and see what he/she is interested in by looks at the item or reaches for the item. Then we restrict access to those items during the day so, they are more motivated (if the get access to those items all day they are not going to ask for it). To know when that motivation is strong? For example, when we are working on teaching food. We will teach them how to mand for different types of food when they are hungry not after dinner. When teaching the mand we made sure that, the learner has a hight motivation for it. The leaner will not become satiated with mand quickly so that we must allow for multiple trails. For example, if we are teaching asking for food “bread” we are not going to give the full bread, bocouse they are going to get full and therefore not mand for more. To get multiple trails, break that bread into pieces, and make sure to deliver it quickly and easily.

Figure 14: ways of exposing games and puzzles

The word that we teach for mand must go through, echoic, tact then mand. We started with items that are available and the motivation for them is frequently strong for the child. For

example, food (break, chip, apple, orange, biscuit, and for drinks water, juice and milk) Toys (ball car, train, puzzle). physical actions (come here, give me, open/close the door, sit down/ sit up, push, spin, and hug). Teaching the mand begins in the natural environment where motivation is strong (it can take place at the table too).

To start the teaching procedure for the mand we present a variety of highly preferred items (toys, puzzles) Figure 14. First, present the items (a nonverbal stimulus) and wait for the learner to show interest or need for an item. Next, the learner will reach for an item, for example, "game" then the therapist will withhold that object and prompt by saying the word "game" (a verbal stimulus), then, wait till the learner says "game" after, therapist delivers the game. Here learner will imitate what the therapist said. The next step is to fade the echoic prompt (because we don't want the learner to rely on prompt). The teaching procedure for mand fading prompt is: the learner, reaches for the game then the therapist withholds the game and pauses for three seconds till the learner says "game". The therapist will then deliver the game to the learner. If the learner does not say "game" give the item's name (up to three times if necessary), If the learner does not repeat, give them the item anyway so they would not become frustrated. The final step is to fade the nonverbal stimulus (on the object) to bring the response form under the sole control of the motivation. When we started the treatment, we removed all they item the learner like, and gave them the name of the item they want and let them repeat it. They were able to ask for any toy after a few weeks of practice, and the tangles came to an end quickly. The objective of early mand training is to develop several different mands by bringing different response forms (words) under the functional control of different motivations. It is important to note that motivation varies in strength over time, and the effects may be temporary.

We have introduced the utterance "what do u want?" later in the treatment, not at the beginning because we are teaching children who are not able to ask for anything yet. If we start by asking the question "what do you want?" and repeat it every time they may become reliant on it as a type of prompt and then, they are not going to request for anythings in the future unless the listener says "what do u want?". We start with one-word utterances, then the goal is to mand using full sentences to communicate. After we had to generalise these skills in the natural environment which was the duty of the parents. We made sure the parent taught the learner words that are related to items used in the natural environment easy to deliver and consumed or dissipate and easy to remove when necessary.

d. Teaching Intraverbal

Many children with autism suffer from deficient intra-verbal repertoires, while some can produce hundreds of mands, tacts, and echoics. For example, a child may say "apple" when hearing "apple" spoken by therapist (echoic), say "apple" when he sees an apple (tact), and ask for an apple when he is hungry (mand), but may not say "apple" when someone asks, "What do you want to eat? alternatively, having a good repertoire of vocabulary does not mean establishing intraverbal behaviour or using it to communicate. Early intraverbal training aims to begin verbal responses that are free from mand, echo, and tact sources of control. That is, no new topography of response is taught; rather, known words are brought under a new type of stimulus control. Teaching intraverbal behaviour of the children with autism does not take place until the child has a well-developed (mand, tact, echo). Motivation can help independent variables to facilitate the transfer of stimulus control. At the end of the day, though, a child has to learn how to produce intraverbal responses that are free from motivational influence. For example, if the intraverbal aim is a verbal stimulus, "we are going home by..." and the child likes cars so, to evoke a 'car' verbal response, the therapist involves transferring control from motivations and non-verbal stimuli to verbal stimuli (echoic stimuli may also be used). The therapist presents the verbal stimulus (we go home by ...) while the motivation is strong along with the nonverbal stimulus by using the object image and, finally, the nonverbal stimulus is fades meaning we do not use a picture.

At the beginning we used simple and straightforward intraverbal relations, using songs, filling the black activity ("the boy is reading a . . ."), animal sounds ("the horse goes . . ."), moving on to common associations ("mom and . . .", brother and …. Big and …) after we moved on to (WH) questions for example ("What do you eat?"). by doing so it will help improve intra-verbal behaviour by increasing the content and variety of verbal stimulation. The therapist is going to use tact as a prompt, it is called a tact to intraverbal transfer procedure with the help pictures as demonstrated in Figure 16. Then remove the prompt (pictures).

Figure 15: flash cards depicting actions

Complex intraverbal teaching is done by having multiple components involved in one verbal stimulus enhances another, as in "What do you do for breakfast?" "On" What are you eating for dinner? "Expansion questions may also be used, such as" What else do you do for lunch? " add to that, when do you eat? and what are you going to eat? In particular, these techniques can help establish an articulate intra-verbal response that is free from tact and echo behaviour. As with other verbal repertoires, using typical developmental sequences is a useful guide to the progression of increasingly complex intraverbal behaviour. Done at the table with the help on pictures book as demonstrated in Figure 17.

Figure 16: Picture book

B. Group 2 Traditional approach

Participants from group 2 where recruited form the Mental Handicap Association, the Children's Center in Mostaganem in Figure 18. It is a privet school that takes care of children with autism and other mental disabilities during working days from 8 am to 4 pm.

They teach children with autism spectrum disorder language based on the topography of language (based on the structure of a language). Meaning focuses on the form of language, characterise by teaching learners first, the alphabet and numbers, second, the words by classifying them into nouns, verbs. Then, phrases after moving on to sentences where children were taught how to structure phrases and sentences without taking into consideration eye contact, motor imitation, facial expressions, motivation other formal language properties include articulation, intonation, pitch, and the most important part is the function of language.

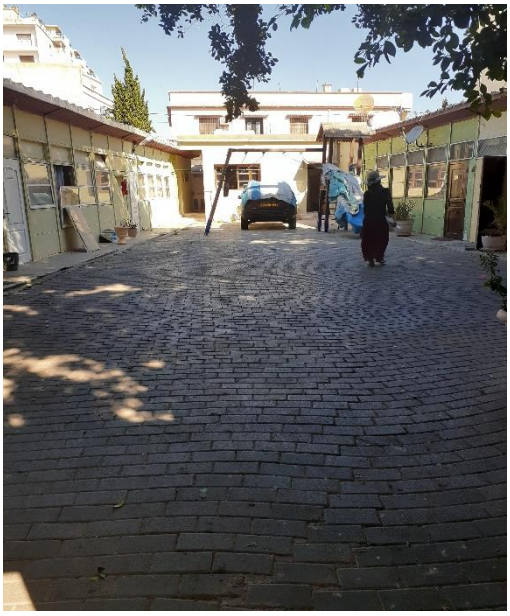

Figure 17: Mentally Handicapped Association, Children's Center at Mostaganem

4. Data collection

This paper is descriptive research that explored the linguistic repertoire of children with Autism Spectrum Disorder (ASD) using the language assessment VB-MAPP.

Figure 18: VB MAPP scoring milestone assessment sample for a participant 04 form group 01

A VB MAPP scoring milestone assessment sample for a participant form group 01 is presented in Figure 19. This is the score for participant 04, a four-year-old boy with autism who has no functional speech at the beginning of the experiment. His overall score for the VB-MAPP

Milestones Assessment (November 2019) is in the Level 1 range, as indicated by a score of 31.5 out of 170 marked by the colour yellow. This puts his language skills around the age of development form 0-18 months. His comparative scores across domains are out of balance with each other, suggesting that certain skills are much better than others. His main strengths are in the areas of listening skills, echoic, vocal, while his deficiencies are in the areas of mand, tact, and motor imitation and visual perceptual and matching-to-sample skills (are the stating points of early language development). Participant 04 VB-MAPP shows that a range of language skills required intervention and development. For example, its profile would indicate that an intensive intervention program would be implemented, with the goal being to build a functional mand repertoire as well as to target tacts, listening skills, and interverbal behaviour. His abilities in listing skills and echo domains can be used to teach mands, tacts, and then move on to interverbal behaviour. After applying Verbal Behaviour approach by working on with participant 04 on the verbal operants. A VB MAPP scoring milestone assessment was applied again in (march 2020). His overall scoring has most of level 1 move on to level 2 range, as indicated by a score of 61 out of 170 marked by the colour red. This places his language abilities around the developmental age of approximately 18-30 months. His comparative scores across domains are beginning to balance with each other demonstrating development in certain skills such as mand, tact, echoic, and vocal indicating that participant 04 has begun to emit some functional speech, but he still needs to develop these skills. In (August 2020) the VB-MAPP Milestones Assessment was applied to indicate the score of 99 out of 170 marked by the colour green. This puts his language skills around the age of development form 30-48 months. Where we see and improvement in verbal operants (mand, tact, echo, vocal, and linguistics) that have paved the way for developing interverbal behaviour. the rest of the VB MAPP scoring milestone assessment sample for the 39 participants are in the appendixes.

5. Result and discussion

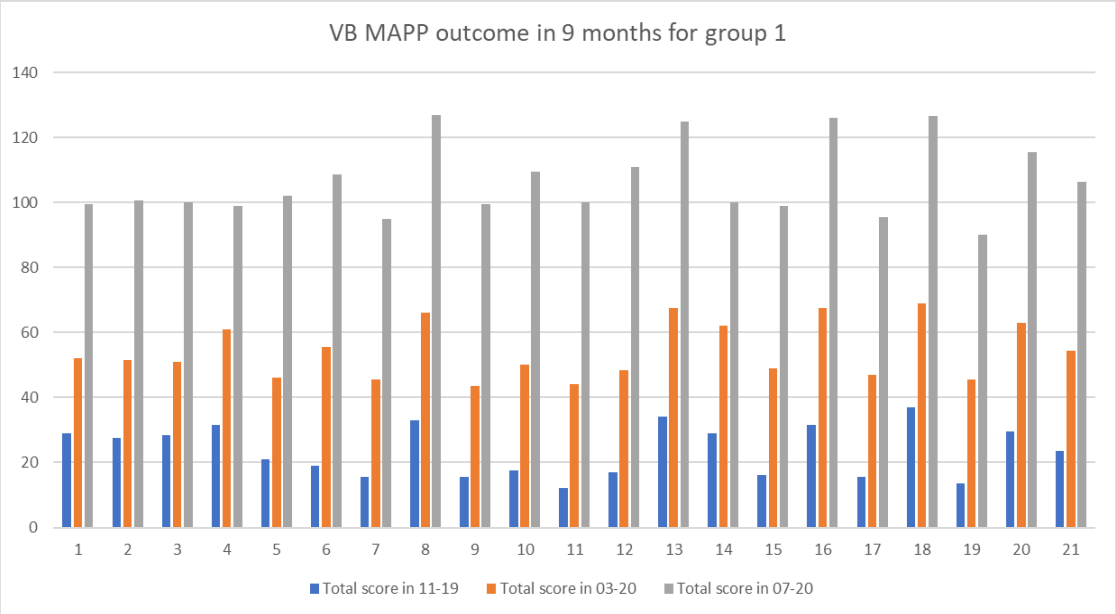

Figure 19: VB MAPP outcome for group 1.

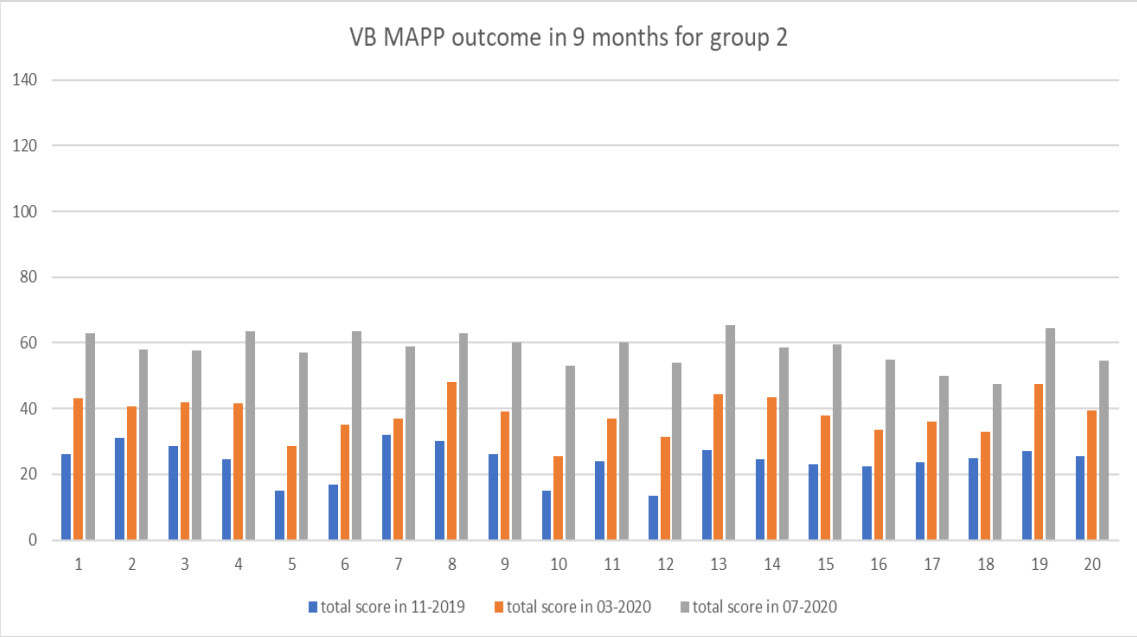

Figure 20: VB MAPP outcome for group 2.

Figure 20 shows the VB MAPP assessment milestone score for group 01 that was assessed to the Verbal behaviour approach. While figure 21 represents the VB MAPP assessment milestone score for group 02 that has been applied to the traditional approach. Extracting the average

score from both graphs represented in figure 1 and 2 resulting in figure 22 demonstrate a better view of the differences between groups 01 and 02.

A. VB MAPP Average Score

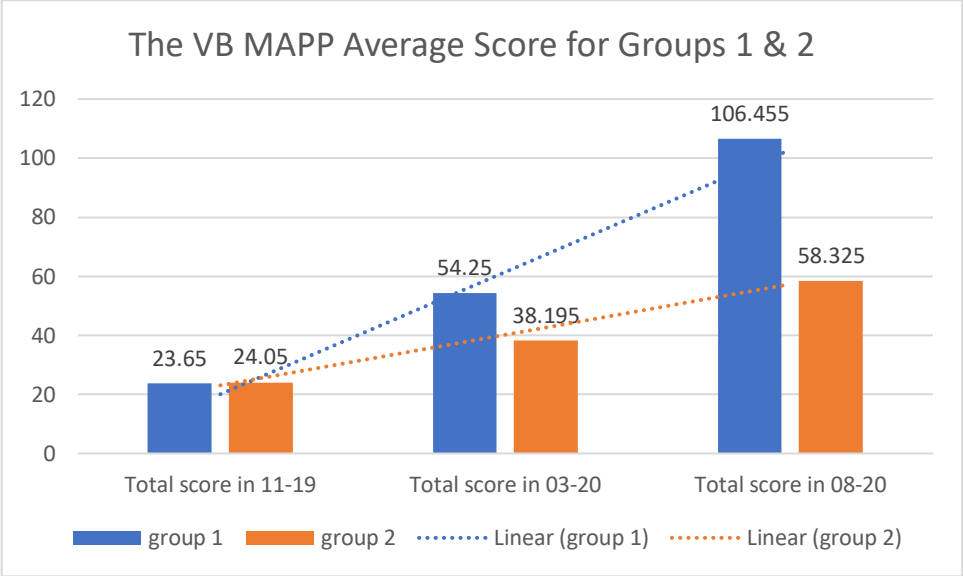

Figure 21: VB MPP Average Score for groups 1 and 2

Figure 22 represents the average score for group 1 is (23.65) while group 2 (24.05) at the begging of the experiment in November 2019. Where the Verbal behaviour was applied to group 1 while group 2 were under the traditional approach. After 4 months form applying both approaches, resulting in an increase of (30.6) in group 1 marked by the average score of (54.25) and a slight development in the average score group 2 (38.195) with an increase of (14.145). In August 2020 the VB MAPP average score for group 1 showed a significant increase by (52.205) reaching to (106.455) at the end of the experiment. In contrast, to group 2 the increase was (20.13) resulting in the total score by (85.235). At the end of the experiment, the considerable increase in group 1 is due to the use of Verbal Behaviour focusing on function language (mand, tact, echoic, and intraverbal). On the other hand, group 2 did not show a development in language repertoire due to the application of the traditional approach where it did not consist of the used of functional language.

B. Average Mand Score

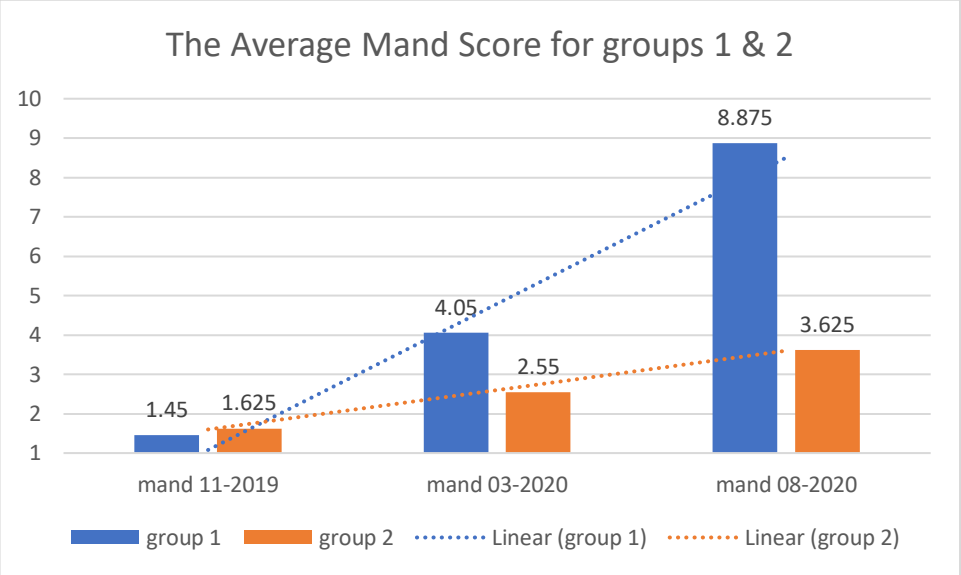

Figure 22: The Average Mand Score for groups 1 and 2.

Figure 23 illustrates the average mand score for groups 1 ad 2. In November 2019 the two groups are comparable were group 1 scored (1.25) similarly group 2 scored (1.63). The mand repertoire score for groups 1and 2 are equivalent indicating that participants from both groups can do up to 2 mands using echoic prompt. In March 2020 after 4 months form applying the verbal behaviour approach to group 1, we can see an increase in the average score for the mand resulting in (4.05) indicates that the participant for group 1 can emit 5 mands in 1 hour without an echoic prompt. Never the less, group 2 after 4 months from applying the traditional approach express an upgrade of (0.96) resulting in (2.55) pointing out that participant for group 2 can only generalize 3 mands across 2 people during a day. In August 2020 the VB MAPP average mand score for group 1 showed a symbolic increase by (4.83) resulting in (8.88) while group 2 remains relatively low marked by the rise of (1.08) resolving in (3.63). Ultimately applying the mand behaviour to group 1 and teaching the participant how to mand for the most relevant items by working on motivation know how to motivate the learner by expressing them to a relevant preferable item in the environment with the help of echoic prompt and generalisation, where the words taught, had to go through echoic, tact then mand behaviour resulted in the participant manding moving form manding using words to manding for more than 10 items using the 2-word phrase. Where group 2 participants can emit 3 mands in one hour (using one word) by implementing the traditional approach (TA).

C. Average Tact Score

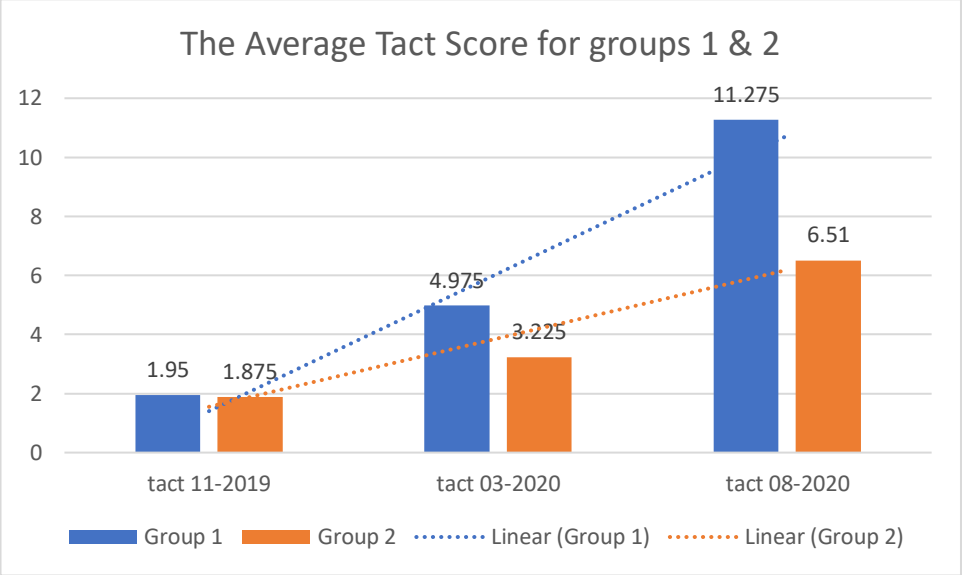

Figure 23: The Average Tact Score for groups 1 and 2.

As it is shown in Figure 24 in November 2019 the average score for both groups are indistinguishable, group 1 is (1.95), and group 2 (1.88). That the tact behaviour for both groups' lines in tacting 4 times at the beginning of the experiment. Few months following the application of both approaches (VB and TA), resulting in an increase of (3.03) for group 1 at a score marked by the average of (4.98) where participants of group 1 can tact up to 10 items. As with, group 2 there was a slight rise in the average score with (1.35) depicting an increase of (2.23) in March 2020, where participants of group 2 could tact only 6 items using echoic prompts. This trend supports the verbal behaviour approach by it play a role in improving and developing the tact repertoire for children with ASD due to the tact training for group 1 by focusing on labelling items under a non-verbal stimulus and echo prompting with the help of using images for a different item of objects in the environment. Otherwise, the good scores on tact behaviour for group 2 based on the usage of the traditional approach were due to this approach being based on teaching words. Beyond this, in August 2020 participants form both groups we examined again and the average tact score for group 1 reveal a score of (11.28), indicated a dramatic growth of (6.3) while group 2 (6.51) with only (3.29). Group 1 could tact more than 100 items with the association of colour and shape and the naming function of 5 items. Where that participant of group 2 could tacts up to 25 items. In review, reaching a good tact repertoire for group 1 was owned to_the heavy training and associating the tact with the mand to maintain this behaviour due to the use of motivation and specific reinforcement, also

by fade the prompt and relying on general reinforcement. And maintain the vocabulary learned by generalising each item by presenting it to the child in different places, sizes, and colour. (with the help of pictures).

D. Average Echoic Score

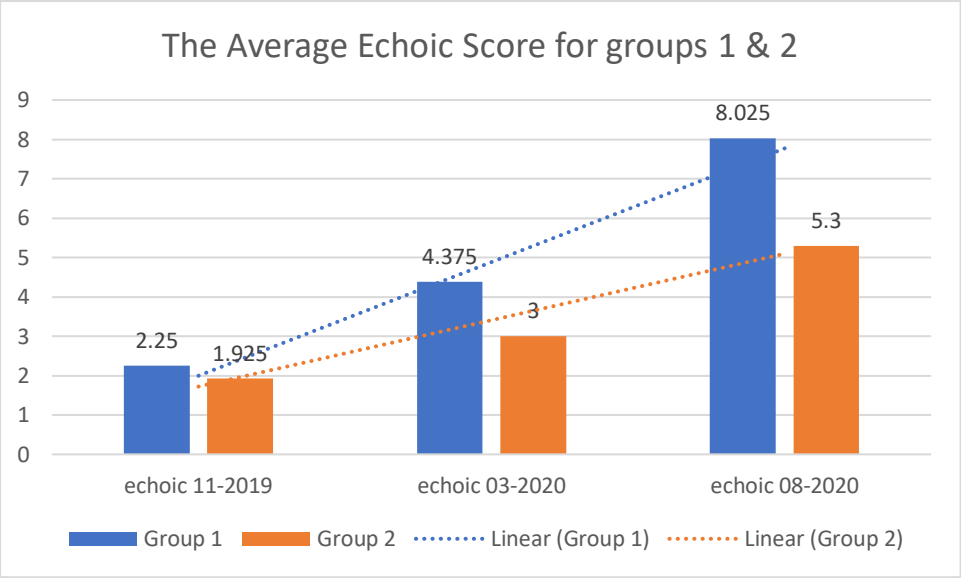

Figure 24: The Average Echoic Score for groups 1 and 2

The column graph in figure 25 represents the average echoic score in November 2019, for group 1 demonstrated by (2.25) just as so, to group 2 by (1.93). The echoic repertoire score for groups is almost identical when launching the experiment where participants from both groups can echoic at least 5 words one syllable. In March 2020, fallowing the application of the verbal behaviour approach to group 1, we can see a shift in the average score for the echoic behaviour resulting in (4.38), indicates that the participant of group 1 at this stage can echo more than 20 words 2 syllables. As for, group 2 who implemented the traditional approach displayed an insignificant rise in echoic behaviour scouring up to (3) revealing that participants of group 2 can only echo up to 10 words with one syllable. This small drift indicated that the traditional approach is not increasing the participants with ASD echoic repertoire. However, group 1 thanks to the application of VB was the reason for the enhancement of children's vocal activity by working on shaping words through pointing to words the mouth where the learner could feel excessive mouth movement. In August 2020 participants form both groups we examined again using the VB MAPP assessment gave the following result: group 1 the average score for the echoic behaviour covey a substantial increase by (3.65) resulting in (8.03) in contrast to, group

2 where there was a supplement transform of (2.5) but remains relatively low marked by (5.3) at the end of the experiment. Where group 1 could echo a combination of up to 70 (word and phrase) 3 syllabics. Alternatively, group 2, in the final analysis, could only echo 25 words (one syllabic + 2). Considering all this, the application of Verbal behaviour approach by working on echoic behaviour through teaching children with ASD motor imitation and working on eye contact has increased their echoic repertoire also, focusing on motivating the children by combining echoic behaviour with mand behaviour where the reinforcement is specific to enhance their vocal activity. Also, by generalization this behaviour by asking the child to echo items they see around them throughout the day. (with the use of images). As for, the good development in echoic behaviour for group 2 where we used the traditional approach was due to this approach being based on teaching through echo prompting.

E. Average Vocal and Linguistics Structure Score

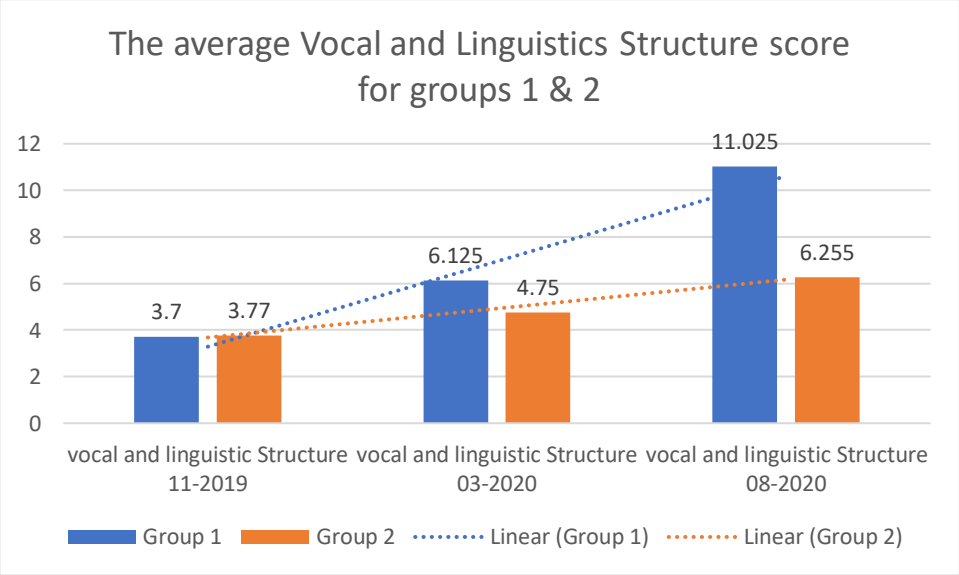

Figure 25: The Average for Vocal and Linguistics Structure Score for groups 1 and 2.

The average score for both groups is close where group 1 is (3.7) while group 2 (3.77) at the begging of the experiment in November 2019 as demonstrated in Figure 26. Currently, participants from both groups can spontaneously emit 3 different whole words during an hour of observation. In due course of 4 months form applying both approaches, resulting in an increase of (2.43) in group 1 marked by the average score of (6.13) and a slight development in the average vocal and linguistics structure for group 2 with (4.75) an increase of (0.98). Pointing that group 1 could articulate 10 understandable tacts where that tact is out of sight. As to group

2 can spontaneously vocalize more than 10 whole words during an hour of observation. In August 2020 the VB MAPP average score for group 1 showed a significant increase by (4.9) reaching to (11.03) at the end of the experiment. In contrast, to group 2 the increase was (1.51) resulting in the total score (6.26). signifying group 1 can emit more than 10 different 2-word utterances associated with the use of tact and mand (functional speech) and emits noun inflection by combing root nouns with suffixes for plurals and possessions (use of subject in a phrase). Despite, group 2 only moved a step farther where the participant could articulate 10 understandable tacts where that tact is out of sight. At the end of the experiment is due to the use of the Verbal Behaviour approach group 1 has developed a good verbal repertoire moving on form emit 3only 3 words to uttering 2-word phrases. On the flip side, group 2 did not show an increase in language repertoire maintain the same level where the participant could only utter words due to the traditional approach not consist of functional language.

F. Average Intraverbal Score

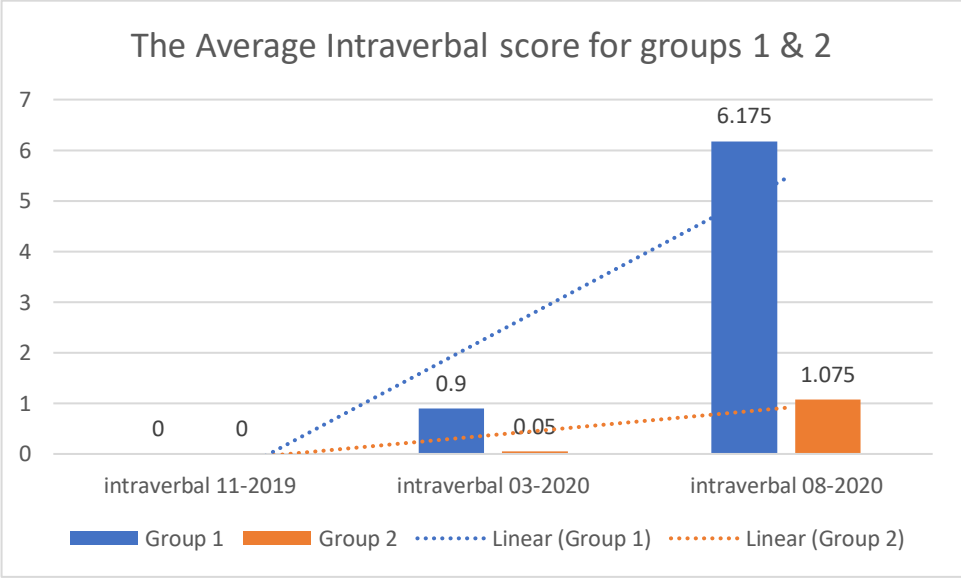

Figure 26: The Average Intraverbal Score for groups 1 and 2

Figure 27 reveals the average intraverbal score in the VB MAPP for groups 1 and 2, wherein November 2019 both of them scored (0) at the begging of the experiment indicating that participants from both groups could not perform any type of communication. Succeeding the application both approaches in March 2020, produced by a slight increase of the intraverbal average in group 1 by (0.9), in the time, group 2 with only (0.5). signifying that participants from group 1 could complete 10 different fill-in-blank tasks of any type, for example, song-fill-

in, animal, or object sounds) regardless to group 2 where participants could barely manage to do so. In August 2020 the VB MAPP assessment was conducted to participants from both groups resulting in the intraverbal average score for group 1 showed a significant increase by (5.28) reaching to (6.18). In contrast, to group 2 the increase was minimally low (1.03) resulting in the total score (1.08). Participants from group 1 could provide their names when asked, answer up to 25 different WH question (e.g. what do u like to eat? Where is mom?) and spontaneously emits 20 intraverbal comments (that could be part of mand) for example mother says" I am going out and the child spontaneously says "I want to go". However, participants from group 2 could only complete 10 different words form fill-in-blank tasks.

Ultimately, the positive results of the high level of echoic, mand and tact that were obtained by group 1 at the end of the experiment lead to good intraverbal behaviour by the usage of words, phrase, sentences, due to the application of the Verbal Behaviour approach while focusing on function language (verbal operants). Demonstrating functional language where participants could echo a combination of up to 70 words and phrase (3 syllabics), tact more than 100 items with the association of colour, shape, and tact the function of 5 items. Add to that, participants could mand using a 2-word phrase with the absence of echoic or tact prompt. participant from group 1 could hold up a good conversation by answering up to 25 WH questions. On the other hand, group 2 did not show markable development in linguistics ability based on the application of the traditional approach. Where children with ASD where taught language based on the topography of language (form). Participants from group 1 in the period of 9 months with the help of the Verbal behaviour approach developed form producing less than 5 words to more than 100 words also, using phrases and sentences in functional speech. Moreover, these participants moved from level one (0-18 month) to almost level three (30-48 months) of typically developed peers based on the VB MAPP measurement and from the average score of (23.65) to (106.455) at the end of the experiment. Otherwise, group 2 developed from producing less than 5 words to 25 words. Stepped from level one (0-18month) to a slightly reaching level 2 (18-30) of typically developing peers along with not full achieving level one with average score form (24.05) to (58.325) in 9 months.

Based on the results obtained in this paper that validates the verbal behaviour approach corresponds to the research established by (Sundberg, Michael 2001) revealing that the procedures and techniques of applied behaviour analysis have greatly benefited children with autism. Suggested that additional benefits can be made by applying certain aspects of the verbal behaviour analysis of Skinner by emphasising on verbal operators as a relevant analytical unit.

Based on reinforcement in assessing and teaching verbal abilities as an essential influence. Skinner’s approach may help in the language acquisition for children with autism by focusing on the words and functions of language rather than traditional focuses on words and meanings.

In this research, the influence of family and parents of a participants, especially mothers, give abig contribution especially in assisting the implementation of the Verbal behavior approach by generalising and maintaining the skills learned at the table time and outside. According to (Lovaas 2011), in addition to treatment, the position of parents was still required for domestic handling. Families, both fathers, and mothers should be the leaders of whoever decides to be involved in the care of autistic children. This shows the family's role is a significant factor in influencing the progress of participants' treatment.

General Conclusion

The present research aimed to develop children with autism spectrum disorder's language ability using the verbal behaviour approach. We testified the validity of Skinner's verbal behaviour approach, by comparing it to the group of children with ASD who have been exposed to a traditional approach, in a process of nine months of applying both approaches.

The verbal behaviour approach exhibited a significant development in language ability where participants developed form producing less than 5 words to more than 100 words, using words phrases and sentences in functional speech. In addition, these participants moved from level one (0-18 months) to almost level three (30-48 months) of typically developed peers based on VB MAPP measurements and from the average score (23.65) to (106.455) at the end of the study. As a direct consequence of relying on the language functions of the verbal operands (echoic, tact, mand, intraverbal) in contrast to, the application of the traditional approach that did not display a significant development in linguistic ability. Where it demonstrated a development from less than 5 words to 25 words with minimal use of words in functional speech, as well as, moving from level 1 (0-18 months) to a slightly level 2 (18-30) of typically developing peers with low performance in level 1, in view of focusing on language form in the process of teaching language rather than function.

These findings demonstrate the importance of implementing the verbal behaviour approach to treat language deficiency in children with autism spectrum disorder and it validates our hypotheses presented at the beginning of this research that the verbal behaviour approach is effective in teaching language to children with autism spectrum disorder. Moreover, by using The Verbal Behavior Milestones Assessment and Placement Program as a language assessment we have understood that children with ASD go through the same language development stages as typically developed children but with a noticeable delay.

The study contributes to our understanding that in the process of teaching language we should focus on the function of language as well as the form. The use of verbal behaviour approach signifies that language develops systematically. Additionally, the use of the VB MAPP in this research indicates that language can be measured scientifically. Form it we exclude that language does not develop if we do not use for communication it and interact with other people. verbal behaviour approach pushes individuals with autism to communicate by building an atmosphere where they are trained and forces to interact and communicate vocally or non-vocal with other people.

This study has one main limitation considered to be durational. As we know autism is a complex disorder and language development is a long process due to the period of this research, we were confined to only nine months of language training and data collection.
Based on the time limit and language development bing a long process the outcome in this study should be taking into consideration for feather researches. Future research projects should include additional outcome studies for both methods as well as, more empirical scientific data. And for further studies, they may concentrate on other verbal behaviour categories and skills such as writing, reading. Moreover, research into the development of spontaneous language in autistic learners.

The practical implication of this study is that the results of this research could be seen as evidence for local state managers of the efficacy of the verbal behaviour approach as a language treatment and the need to open special centres for children with autism. In addition, special schools should incorporate this treatment to improve language and communication skills. Also, all caregivers on the autistic field (teacher, parents, and speech pathologist) should be informed about this approach.

As we know The Verbal Behavior Milestones Assessment and Placement Program: The VB-MAPP is an assessment tool, program guide, and ability tracking system designed for children with autism and other individuals with language delays by Sundberg is based on the English language and it was translated into Arabic. Linguists and speech pathologists should work together to develop assessments and programs for children based on the Arabic stranded language or the Algerian dialect.

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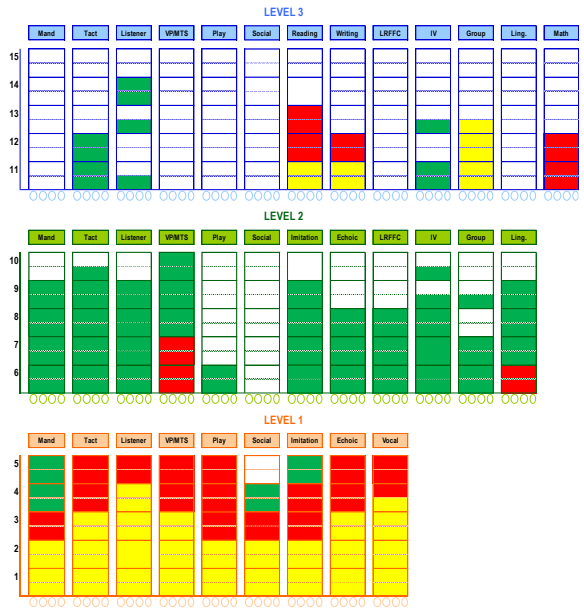
Appendix

VB MAPP milestone scores for Group 1:

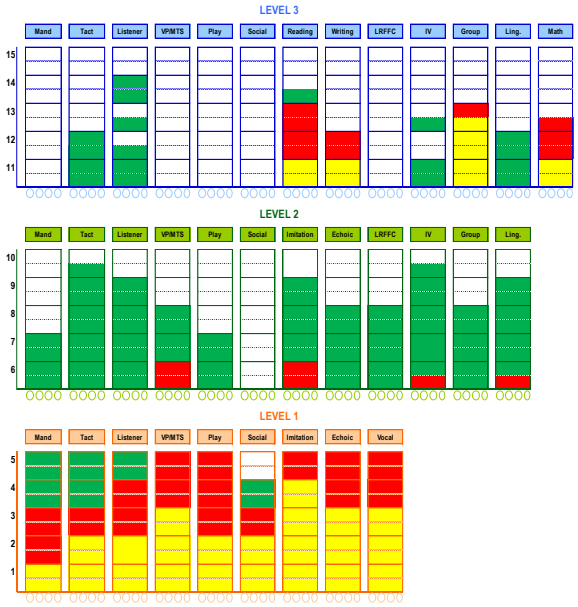
Child's name:	Belkacem
Date of birth:	28-08-2014
Age at testing:	5 2 5 3 5 4

Key:	Score	Date	Color	Tester
1st test:	29	Nov-19		
2nd test:	52	Mar-19		
3rd test:	99.5	Aug-20		
4th test:				



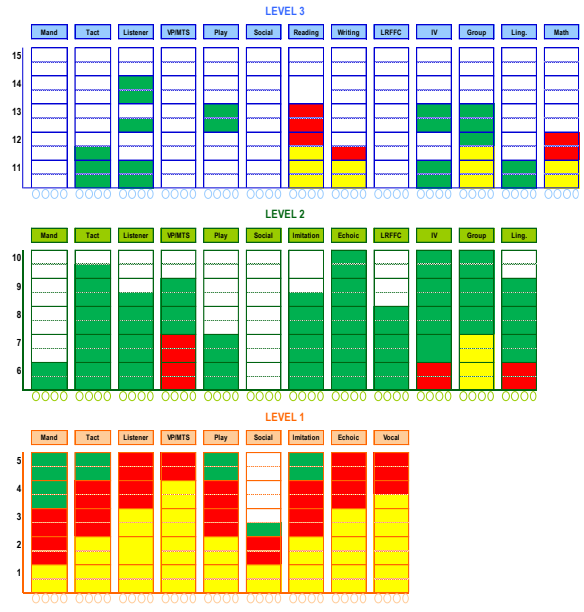
Child's name:	habib
Date of birth:	07-07-2013
Age at testing:	6 2 6 3 7 4

Key:	Score	Date	Color	Tester
1st test:	27.5	Nov-19		
2nd test:	51.5	Mar-19		
3rd test:	100.5	Aug-20		
4th test:				



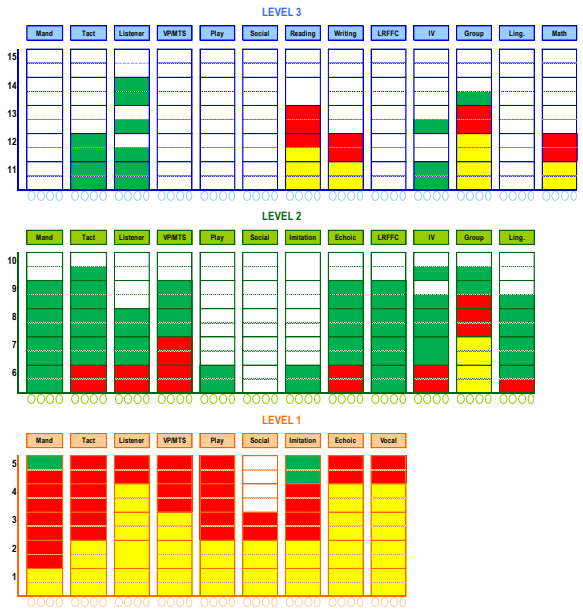
Child's name:	mustafa
Date of birth:	18-05-2013
Age at testing:	1 6 2 6 3 7 4

Key:	Score	Date	Color	Tester
1st test:	28.5	Nov-19		
2nd test:	51	Mar-19		
3rd test:	100	Aug-20		
4th test:				



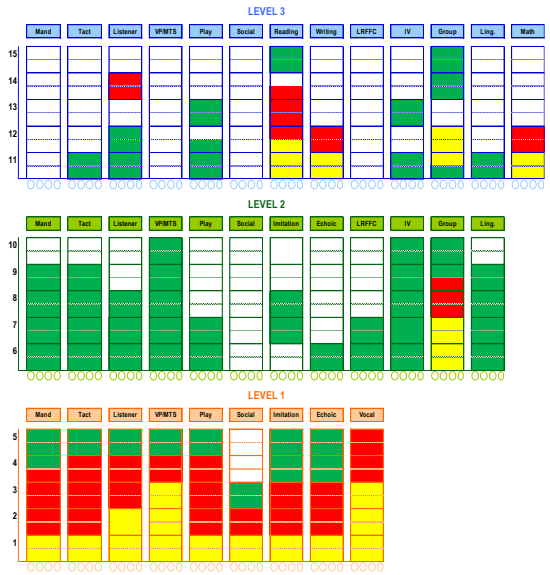
Child's name:	javad
Date of birth:	30-10-2015
Age at testing:	4 2 5 3 5 4

Key:	Score	Date	Color	Tester
1st test:	31.5	Nov-19		
2nd test:	61	Mar-19		
3rd test:	99	Aug-20		
4th test:				



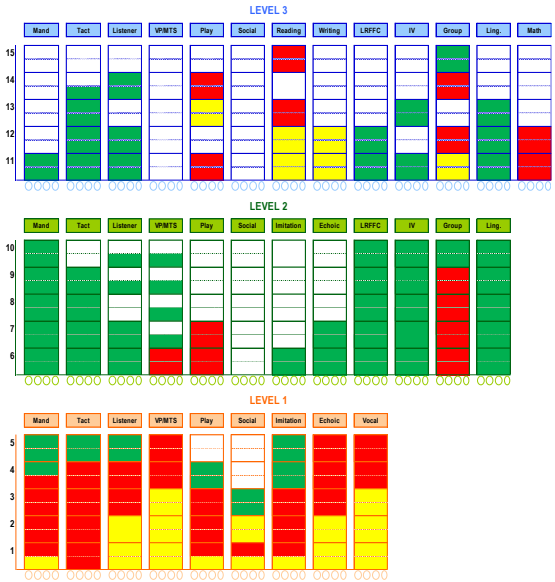
Child's name:	Sidi ahmed
Date of birth:	14-06-2014
Age at testing:	1 5 2 5 3 6 4

Key:	Score	Date	Color	Tester
1st test:	21	Nov-19		
2nd test:	46	Mar-19		
3rd test:	102	Aug-20		
4th test:				



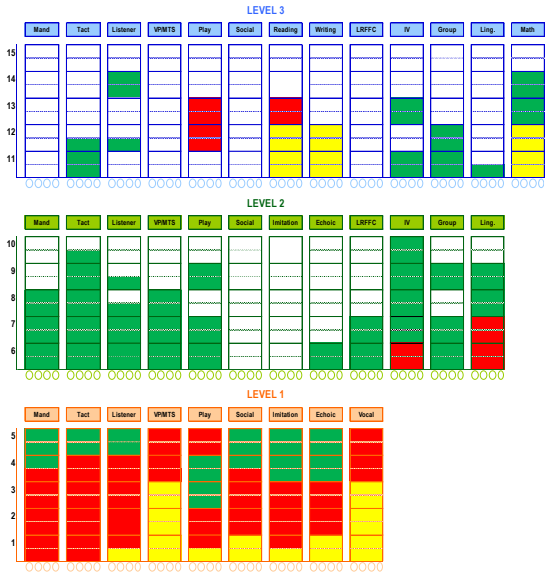
Child's name:	mohammed
Date of birth:	20-07-2013
Age at testing:	6 2 6 3 6 4

Key:	Score	Date	Color	Tester
1st test:	19	Nov-19		
2nd test:	55.5	Mar-19		
3rd test:	108.5	Aug-20		
4th test:				



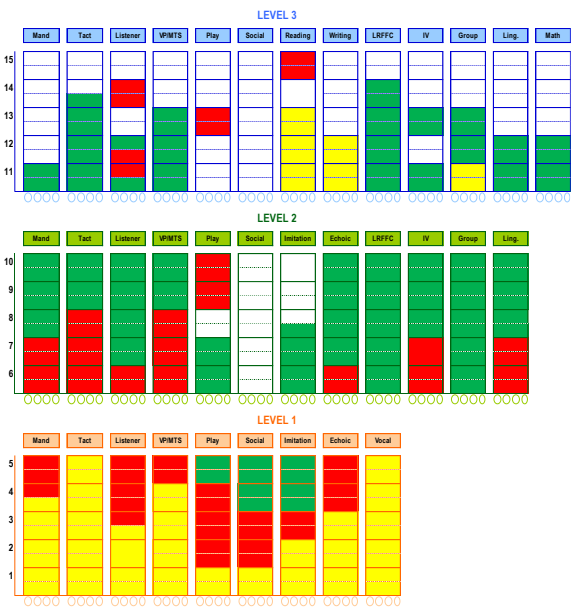
Child's name:	ishak
Date of birth:	09-04-2014
Age at testing:	5 2 5 3 6 4

Key:	Score	Date	Color	Tester
1st test:	15.5	Nov-19		
2nd test:	45.5	Mar-19		
3rd test:	95	Aug-20		
4th test:				



Child's name:	amine
Date of birth:	21-02-2011
Age at testing:	8 2 8 3 9 4

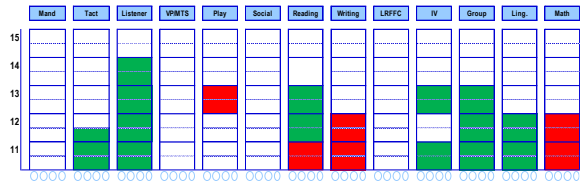
Key:	Score	Date	Color	Tester
1st test:	33	Nov-19		
2nd test:	66	Mar-19		
3rd test:	127	Aug-20		
4th test:				



Child's name:	moussa
Date of birth:	02-01-2014
Age at testing:	1 5 2 6 3 5 4

Key:	Score	Date	Color	Tester
1st test:	15	Nov-19		
2nd test:	43.5	Mar-19		
3rd test:	99.5	Aug-20		
4th test:				

LEVEL 3



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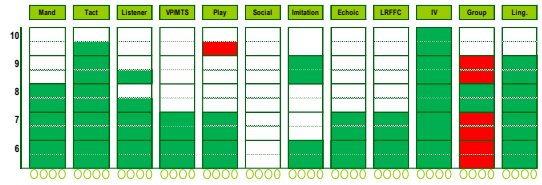

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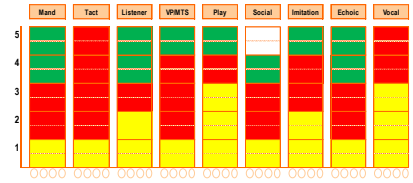
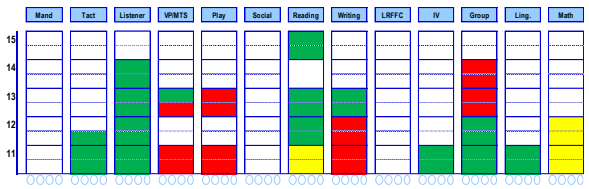


Child's name:	zakaria
Date of birth:	23-05-2015
Age at testing:	4 2 4 3 5 4

Key:	Score	Date	Color	Tester
1st test:	17.5	Nov-19		
2nd test:	50	Mar-19		
3rd test:	109.5	Aug-20		
4th test:				

LEVEL 3



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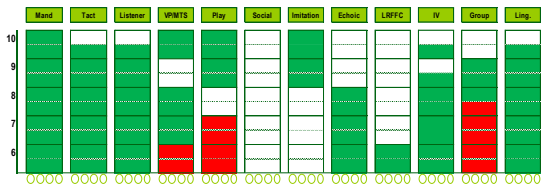

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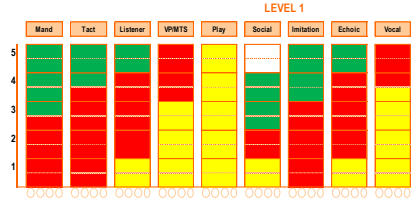
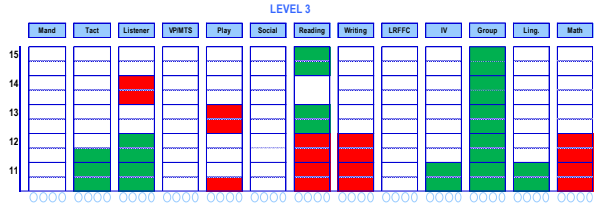


Child's name:	Haytham
Date of birth:	08-09-2014
Age at testing:	1 5 2 5 3 5 4

Key:	Score	Date	Color	Tester
1st test:	12	Nov-19		
2nd test:	44	Mar-19		
3rd test:	100	Aug-20		
4th test:				

LEVEL 3



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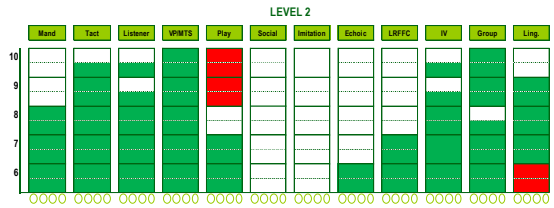

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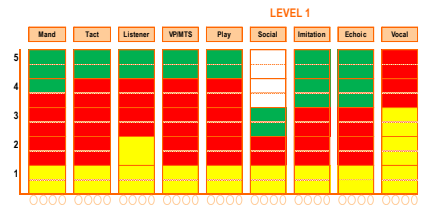
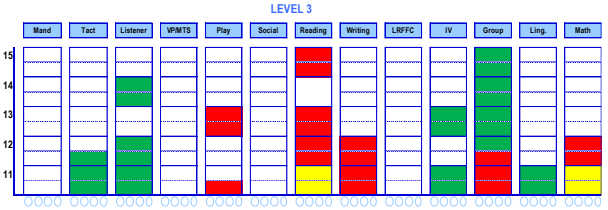


Child's name:	ayah
Date of birth:	01-20-2014
Age at testing:	4 2 5 3 5 4

Key:	Score	Date	Color	Tester
1st test:	17	Nov-19		
2nd test:	48.5	Mar-19		
3rd test:	111	Aug-20		
4th test:				

LEVEL 3



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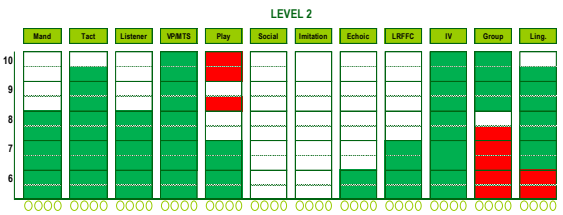

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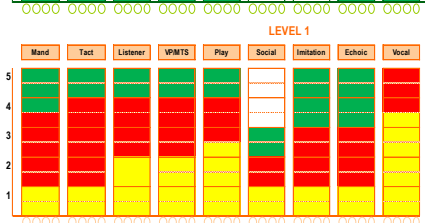
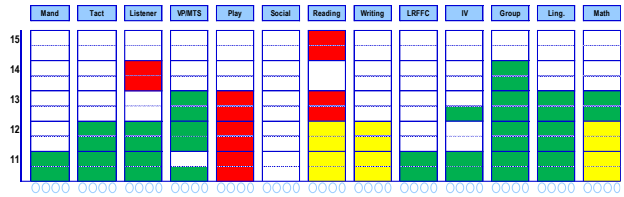


Child's name:	abdelhadi
Date of birth:	19-07-2014
Age at testing:	5 2 5 3 6 4

Key:	Score	Date	Color	Tester
1st test:	34	Nov-19		
2nd test:	67.5	Mar-19		
3rd test:	125	Aug-20		
4th test:				

LEVEL 3



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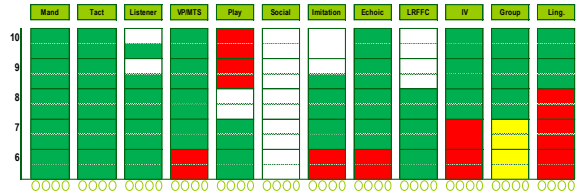

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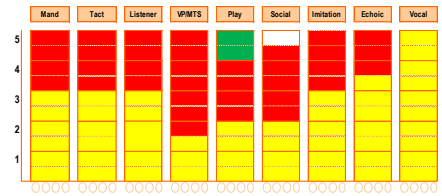
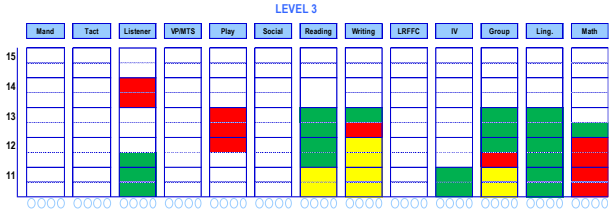


Child's name:	sala7
Date of birth:	04-08-2013
Age at testing:	7 2 7 3 7 4

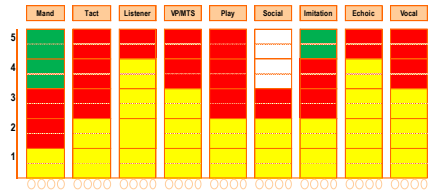
Key:	Score	Date	Color	Tester
1st test:	29	Nov-19		
2nd test:	62	Mar-19		
3rd test:	100	Aug-20		
4th test:				

LEVEL 3



LEVEL 2

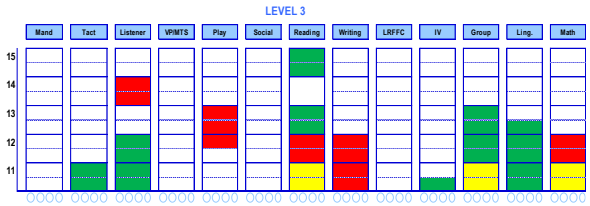
LEVEL 1



Child's name:	riyad
Date of birth:	03-04-2013
Age at testing:	1 6 2 6 3 7 4

Key:	Score	Date	Color	Tester
1st test:	16	Nov-19		
2nd test:	49	Mar-19		
3rd test:	99	Aug-20		
4th test:				

LEVEL 3



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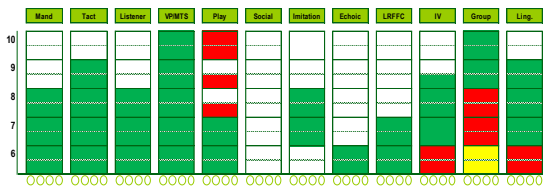
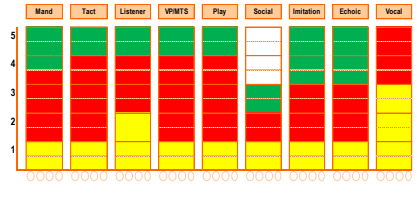


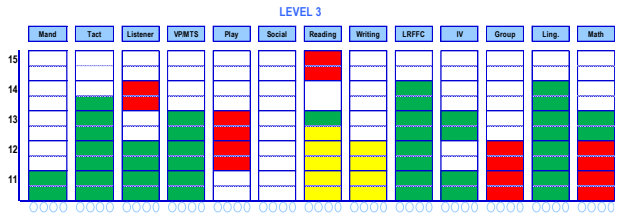
LEVEL 1



Child's name:	meriem
Date of birth:	24-02-2011
Age at testing:	1 8 2 9 3 9 4

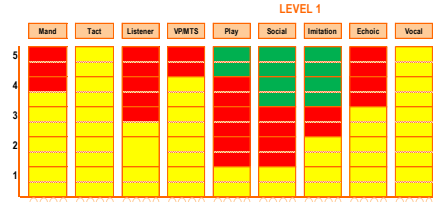
Key:	Score	Date	Color	Tester
1st test:	31.5	Nov-19		
2nd test:	67.5	Mar-19		
3rd test:	126	Aug-20		
4th test:				

LEVEL 3



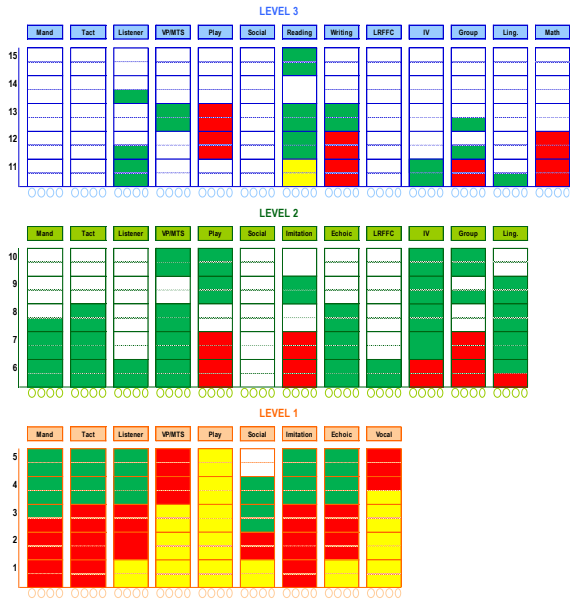
LEVEL 2

LEVEL 1



Child's name:	khaled
Date of birth:	05-09-2014
Age at testing:	1 5 2 5 3 5 4

Key:	Score	Date	Color	Tester
1st test:	15.5	Nov-19		
2nd test:	47	Mar-19		
3rd test:	95.5	Aug-20		
4th test:				

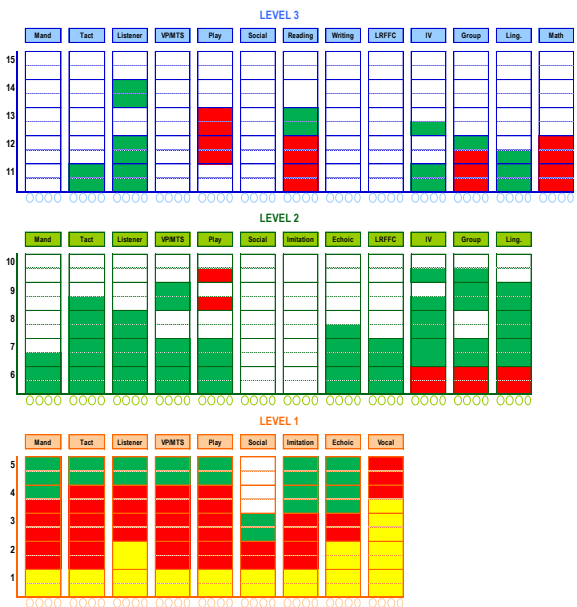


Child's name:	leyla
Date of birth:	29-07-2012
Age at testing:	1 7 2 7 3 7 4

Key:	Score	Date	Color	Tester
1st test:	37	Nov-19		
2nd test:	69	Mar-19		
3rd test:	126.5	Aug-20		
4th test:				

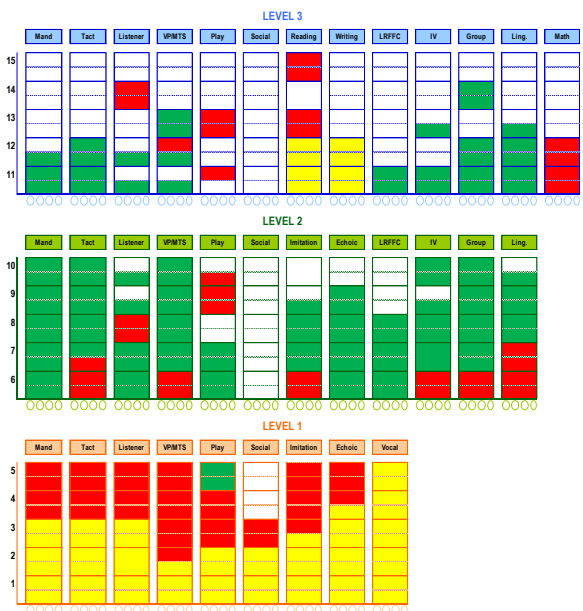
Child's name:	rayan
Date of birth:	04-08-2013
Age at testing:	1 6 2 5 3 5 4

Key:	Score	Date	Color	Tester
1st test:	13.5	Nov-19		
2nd test:	45.5	Mar-19		
3rd test:	90	Aug-20		
4th test:				



Child's name:	ilyas
Date of birth:	23/05/2014
Age at testing:	1 5 2 5 3 6 4

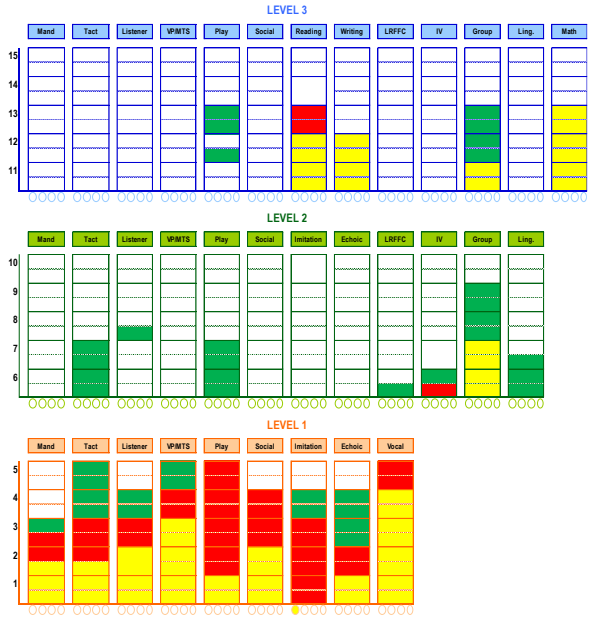
Key:	Score	Date	Color	Tester
1st test:	29.5	Nov-19		
2nd test:	63	Mar-19		
3rd test:	115.5	Aug-20		
4th test:				



VB MAPP milestone scores for Group 2

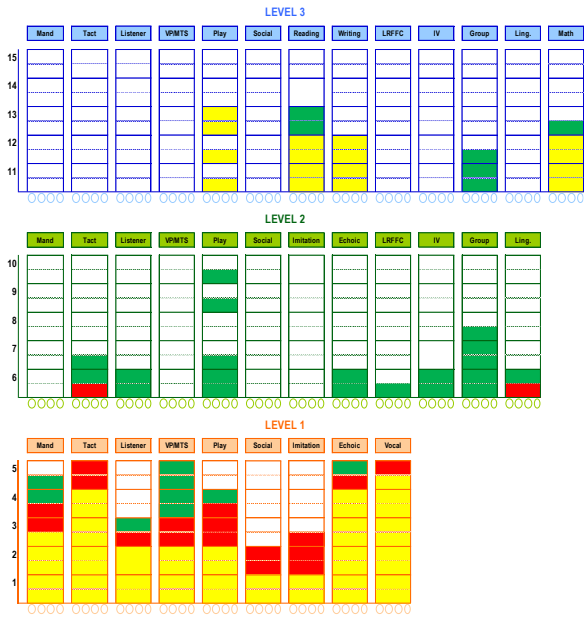
Child's name:	Rahaf
Date of birth:	10/04/2011
Age at testing:	1 8 2 8 3 9 4

Key:	Score	Date	Color	Tester
1st test:	26	Nov-19		
2nd test:	43	Mar-20		
3rd test:	63	Aug-20		
4th test:				



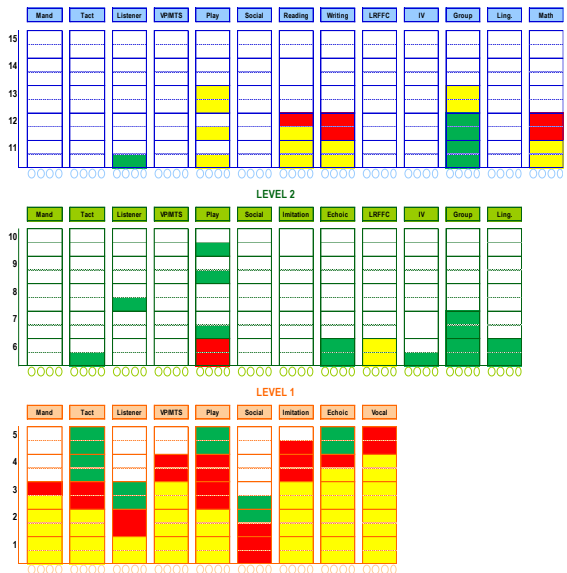
Child's name:	Omar
Date of birth:	20/03/2011
Age at testing:	1 8 2 8 3 9 4

Key:	Score	Date	Color	Tester
1st test:	31	Nov-19		
2nd test:	40.5	Mar-20		
3rd test:	58	Aug-20		
4th test:				



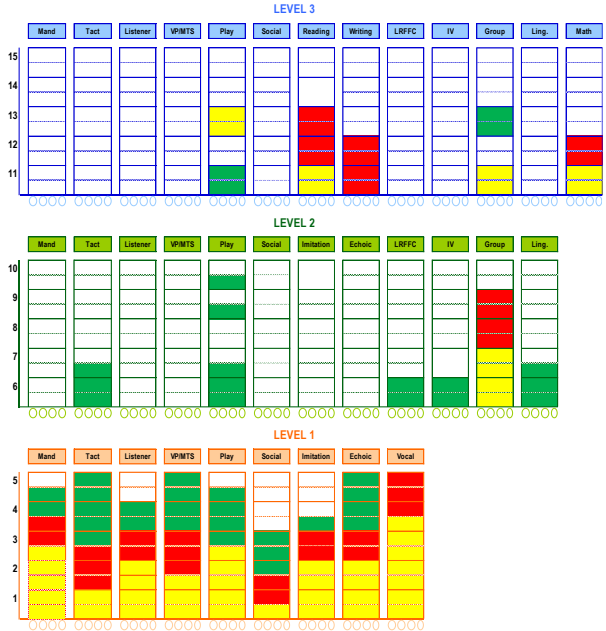
Child's name:	Ali
Date of birth:	16/03/2011
Age at testing:	1 8 2 8 3 9 4

Key:	Score	Date	Color	Tester
1st test:	28.5	Nov-19		
2nd test:	42	Mar-20		
3rd test:	57.5	Aug-20		
4th test:				



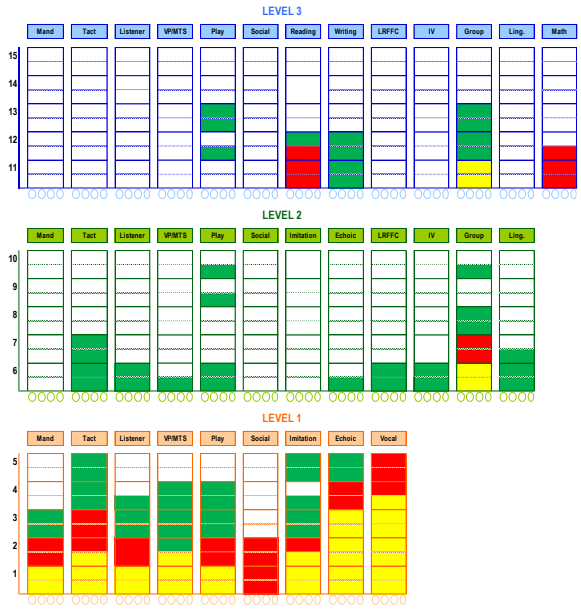
Child's name:	Israa
Date of birth:	17/11/2012
Age at testing:	1 5 2 7 3 7 4

Key:	Score	Date	Color	Tester
1st test:	24.5	Nov-19		
2nd test:	41.5	Mar-20		
3rd test:	63.5	Aug-20		
4th test:				



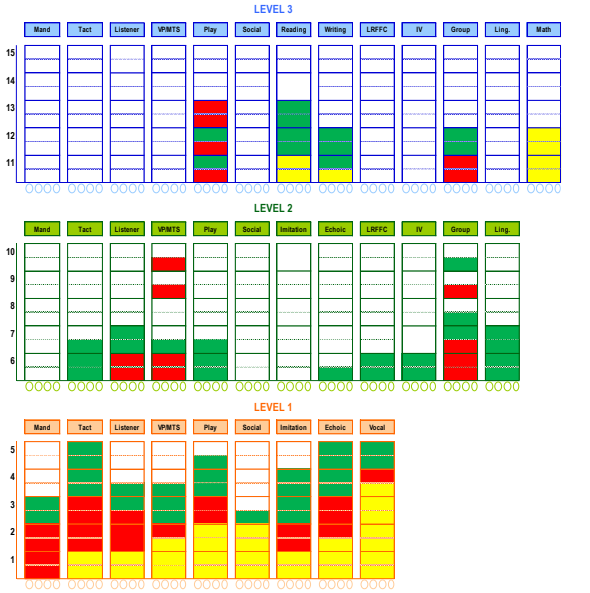
Child's name:	yahya
Date of birth:	06-05-2013
Age at testing:	1 6 2 6 3 7 4

Key:	Score	Date	Color	Tester
1st test:	15	Nov-19		
2nd test:	28.5	Mar-20		
3rd test:	57	Aug-20		
4th test:				



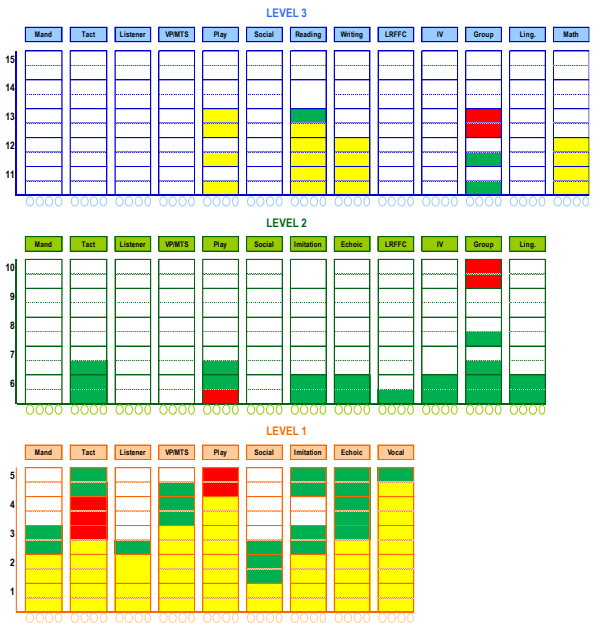
Child's name:	Youcef
Date of birth:	19/04/2014
Age at testing:	1 5 2 5 3 6 4

Key:	Score	Date	Color	Tester
1st test:	17	Nov-19		
2nd test:	35	Mar-20		
3rd test:	63.5	Aug-20		
4th test:				



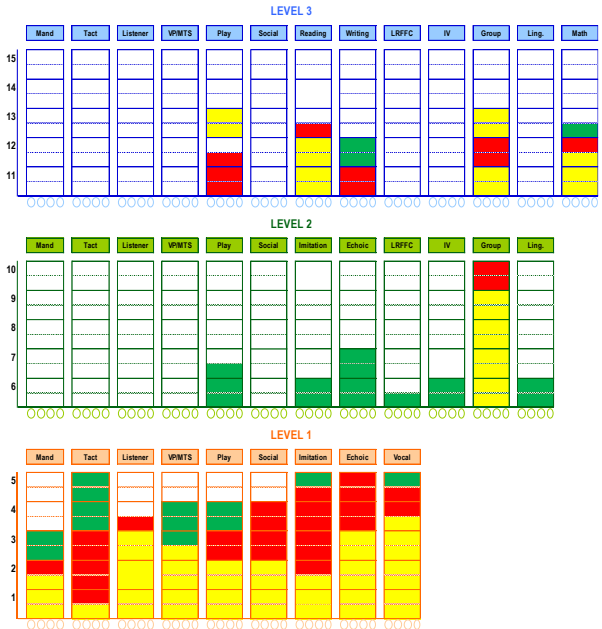
Child's name:	Mehdi
Date of birth:	10/01/2011
Age at testing:	1 8 2 9 3 9 4

Key:	Score	Date	Color	Tester
1st test:	32	Nov-19		
2nd test:	37	Mar-20		
3rd test:	59	Aug-20		
4th test:				



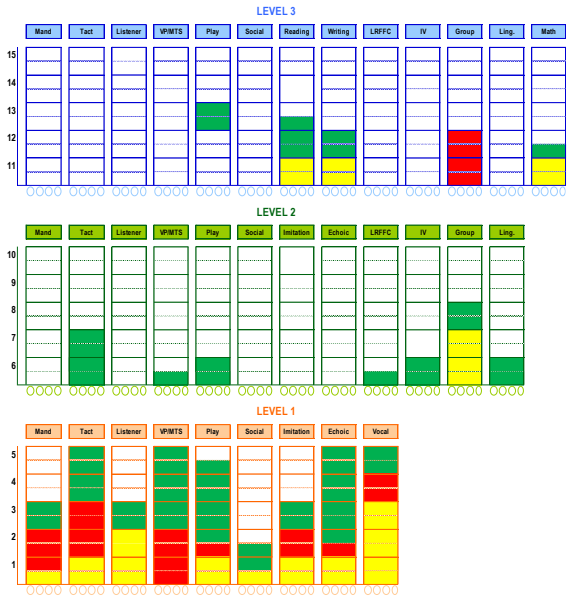
Child's name:	Caimaa
Date of birth:	13/04/2012
Age at testing:	1 7 2 7 3 8 4

Key:	Score	Date	Color	Tester
1st test:	30	Nov-19		
2nd test:	48	Mar-20		
3rd test:	63	Aug-20		
4th test:				



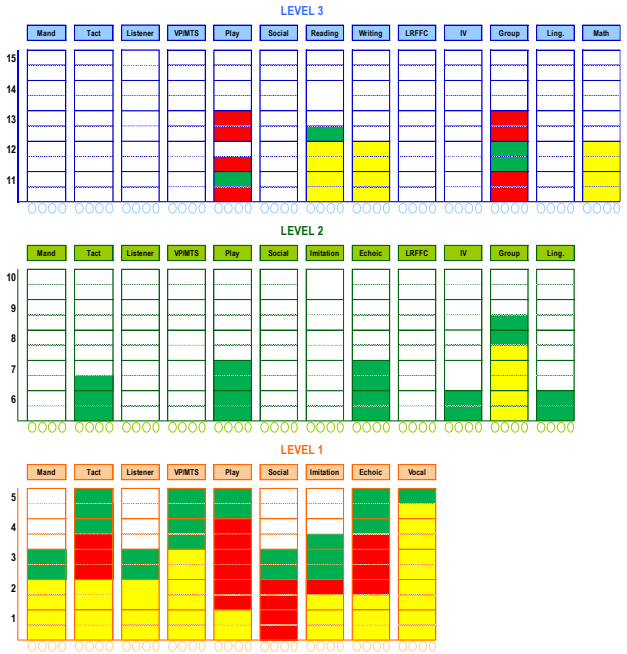
Child's name:	Mehammed
Date of birth:	02/09/2014
Age at testing:	1 5 2 5 3 5 4

Key:	Score	Date	Color	Tester
1st test:	15	Nov-19		
2nd test:	25.5	Mar-20		
3rd test:	53	Aug-20		
4th test:				



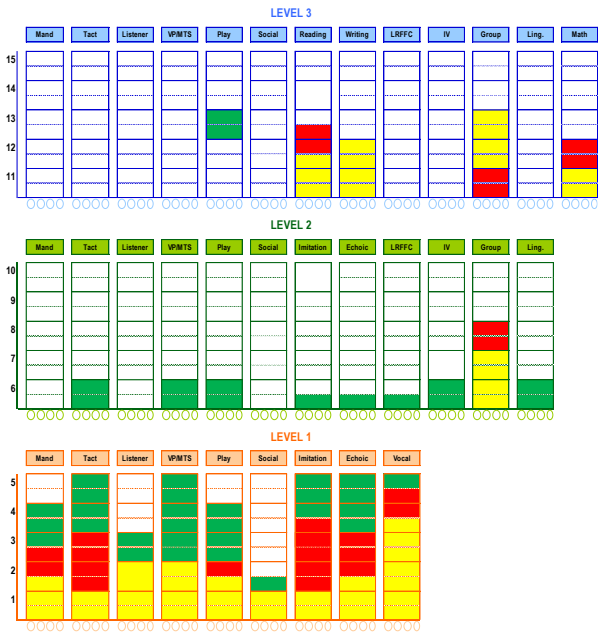
Child's name:	Salah
Date of birth:	22-04-2011
Age at testing:	1 8 2 8 3 8 4

Key:	Score	Date	Color	Tester
1st test:	26	Nov-19		
2nd test:	39	Mar-20		
3rd test:	60	Aug-20		
4th test:				



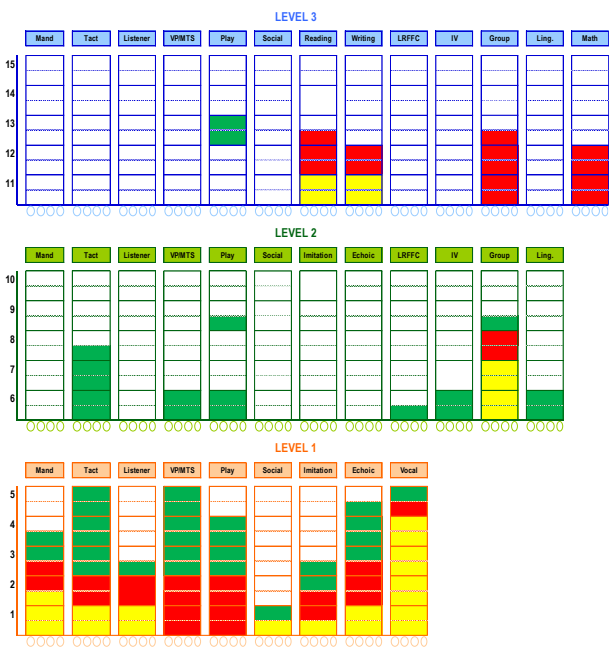
Child's name:	Djawed
Date of birth:	1-07-2011
Age at testing:	1 9 2 9 3 9 4

Key:	Score	Date	Color	Tester
1st test:	24	Nov-19		
2nd test:	37	Mar-20		
3rd test:	60	Aug-20		
4th test:				



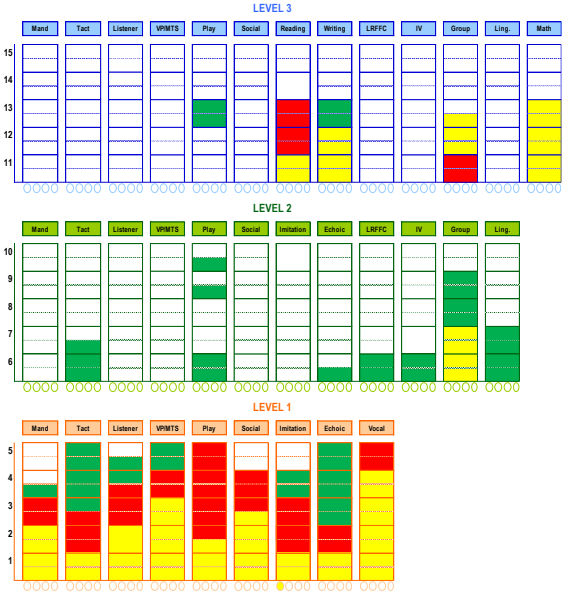
Child's name:	Salah
Date of birth:	08/08/2013
Age at testing:	1 6 2 6 3 6 4

Key:	Score	Date	Color	Tester
1st test:	13.5	Nov-19		
2nd test:	31.5	Mar-20		
3rd test:	54	Aug-20		
4th test:				



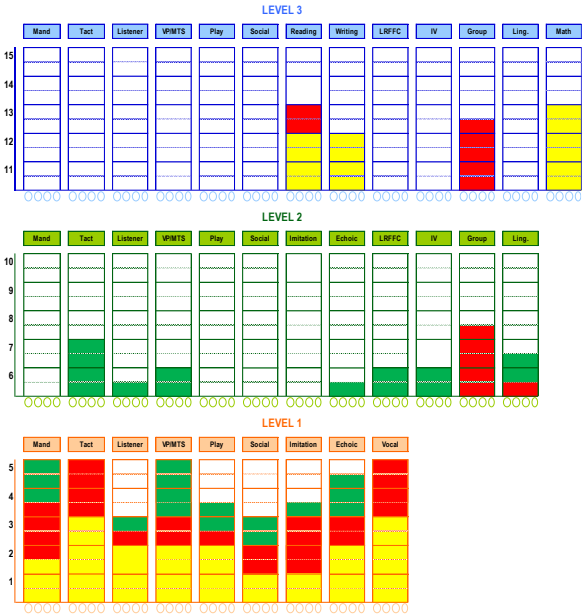
Child's name:	sarah
Date of birth:	24/05/2013
Age at testing:	1 6 2 6 3 7 4

Key:	Score	Date	Color	Tester
1st test:	27.5	Nov-19		
2nd test:	44.5	Mar-20		
3rd test:	65.5	Aug-20		
4th test:				



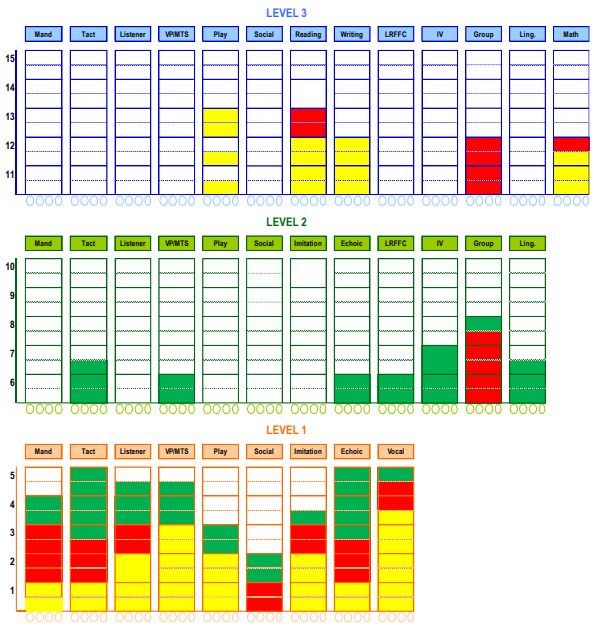
Child's name:	sali
Date of birth:	09-08-2013
Age at testing:	1 6 2 5 3 5 4

Key:	Score	Date	Color	Tester
1st test:	24.5	Nov-19		
2nd test:	43.5	Mar-19		
3rd test:	58.5	Aug-20		
4th test:				



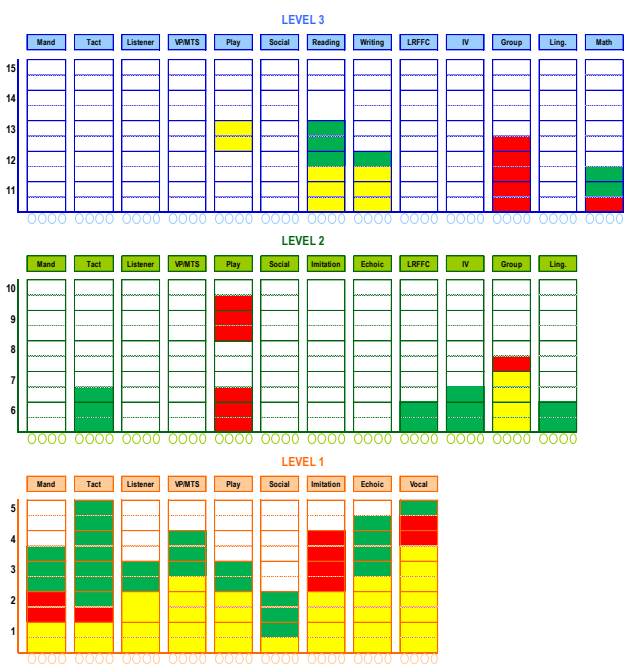
Child's name:	waled
Date of birth:	18-08-2014
Age at testing:	1 5 2 5 3 5 4

Key:	Score	Date	Color	Tester
1st test:	23	Nov-19		
2nd test:	38	Mar-20		
3rd test:	59.5	Aug-20		
4th test:				



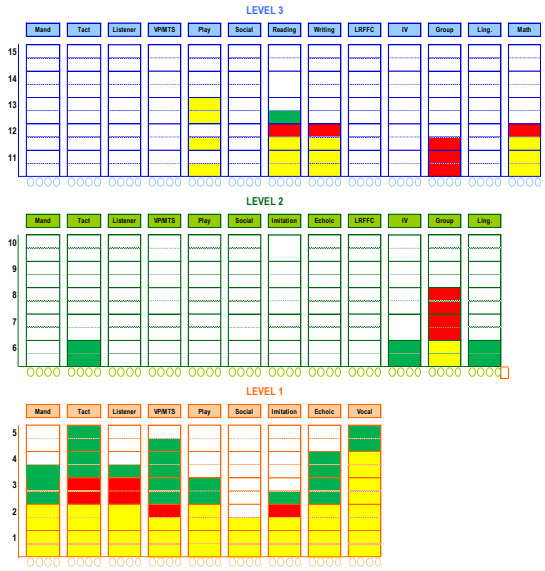
Child's name:	yacin
Date of birth:	06-09-2014
Age at testing:	1 5 2 5 3 5 4

Key:	Score	Date	Color	Tester
1st test:	22.5	Nov-19		
2nd test:	33.5	Mar-20		
3rd test:	55	Aug-20		
4th test:				



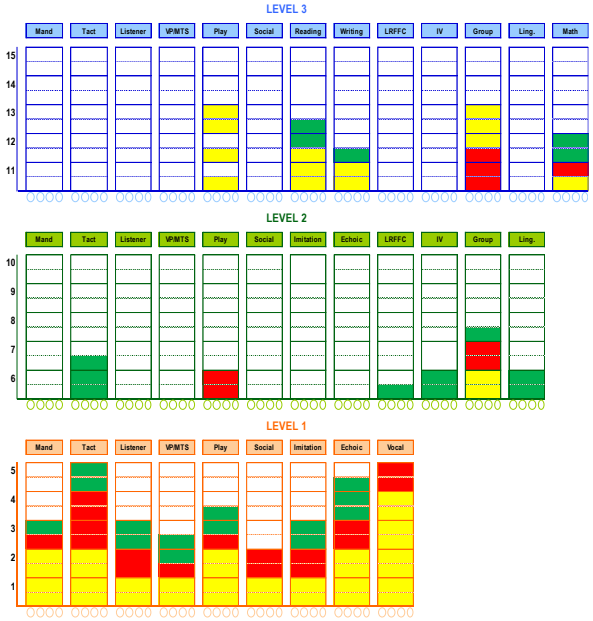
Child's name:	mansour
Date of birth:	04-04-2012
Age at testing:	1 7 2 7 3 8 4

Key:	Score	Date	Color	Tester
1st test:	25	Nov-19		
2nd test:	33	Mar-20		
3rd test:	47.5	Aug-20		
4th test:				



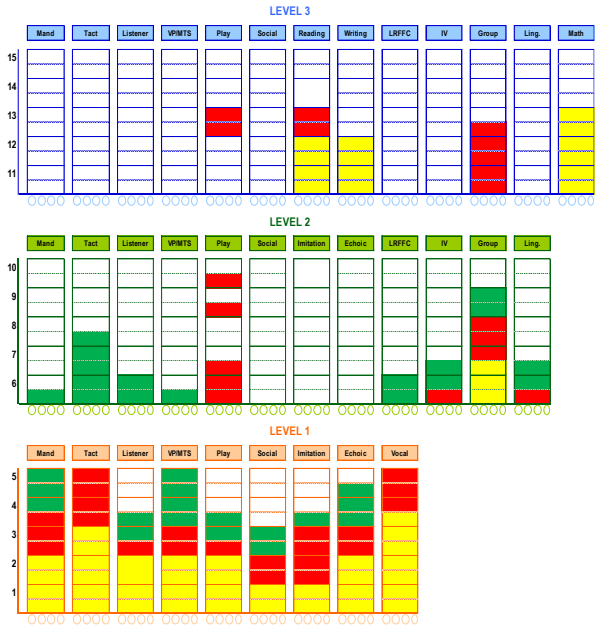
Child's name:	ibrahim
Date of birth:	04-05-2014
Age at testing:	1 5 2 5 3 5 4

Key:	Score	Date	Color	Tester
1st test:	23.5	Nov-19		
2nd test:	36	Mar-20		
3rd test:	50	Aug-20		
4th test:				



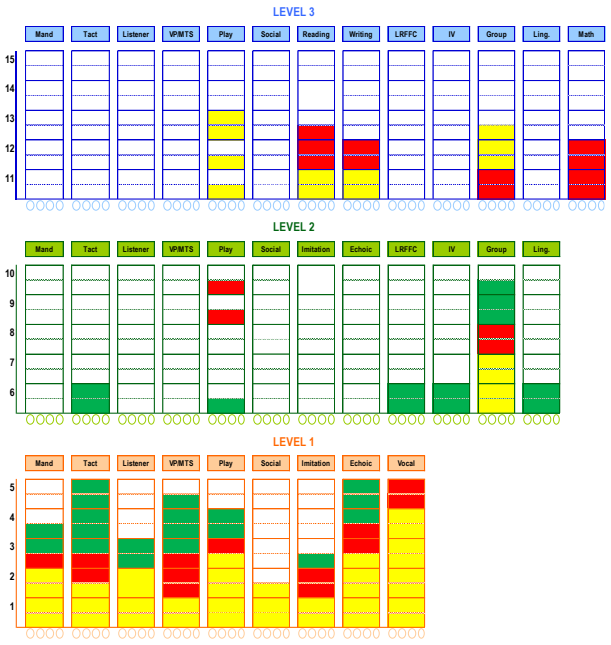
Child's name:	fatima
Date of birth:	05-09-2014
Age at testing:	1 6 2 6 3 6 4

Key:	Score	Date	Color	Tester
1st test:	27	Nov-19		
2nd test:	47.5	Mar-19		
3rd test:	64.5	Aug-20		
4th test:				

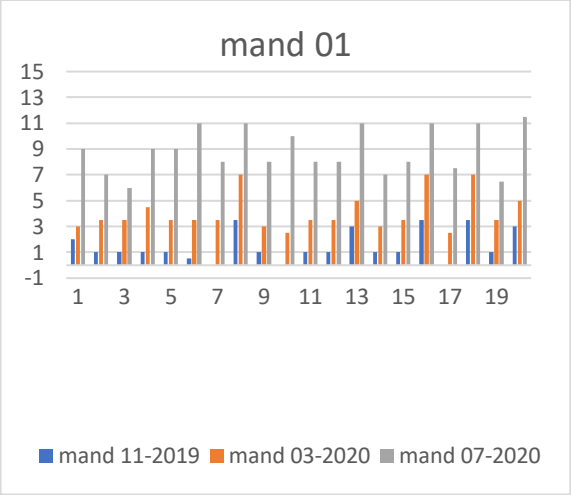


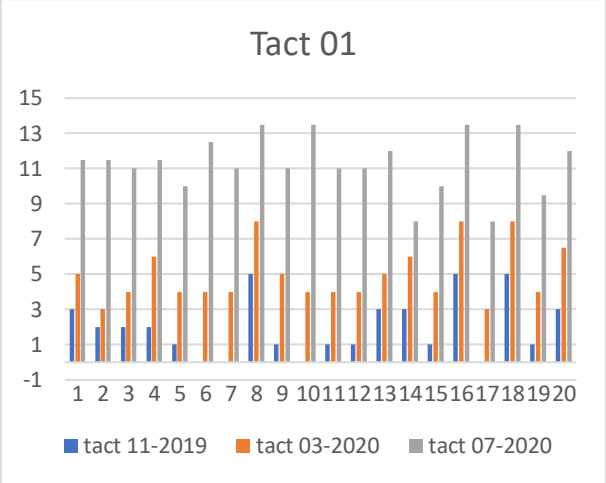
Child's name:	abdualiah
Date of birth:	30--06-2013
Age at testing:	1 6 2 6 3 7 4

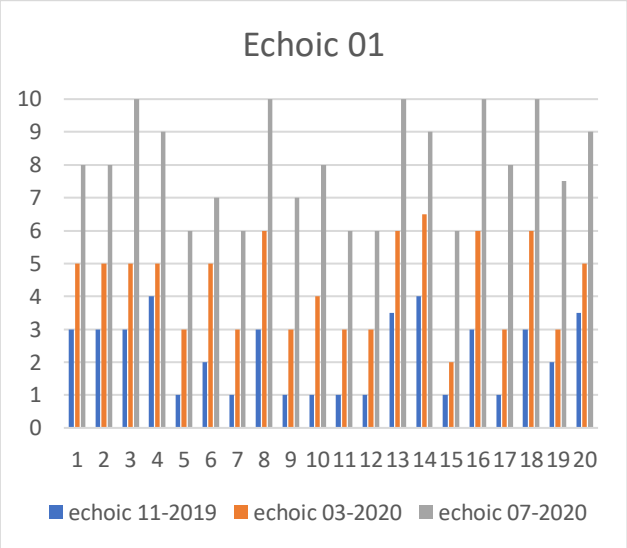
Key:	Score	Date	Color	Tester
1st test:	25.5	Nov-19		
2nd test:	39.5	Mar-20		
3rd test:	54.5	Aug-20		
4th test:				

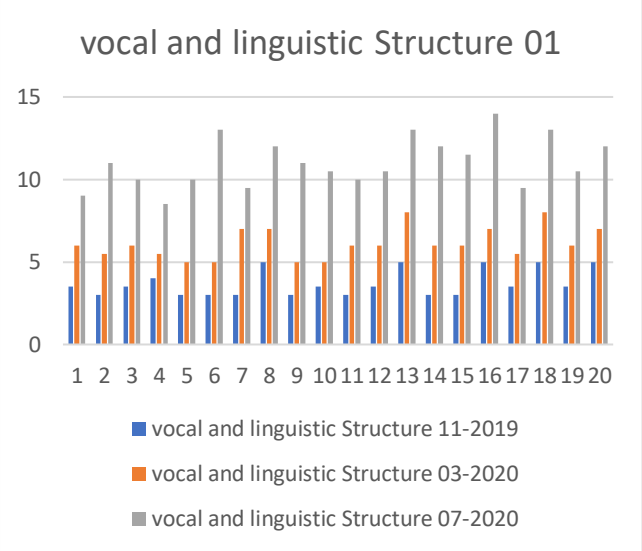


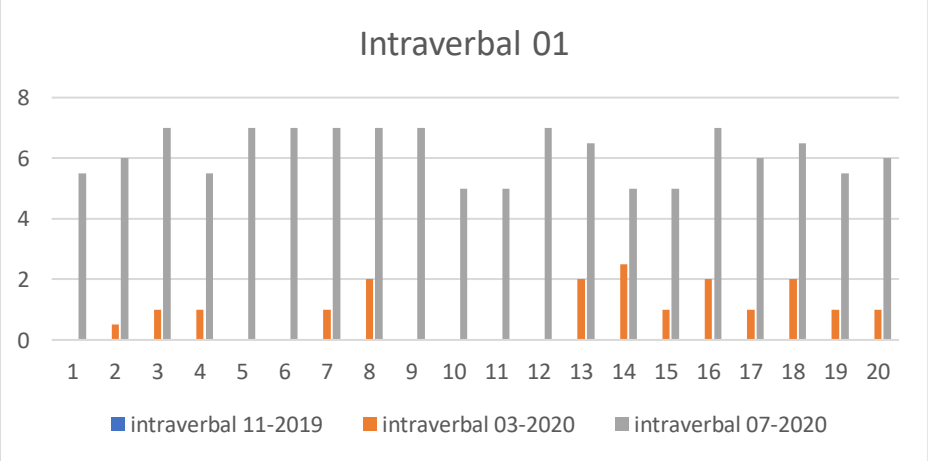
Results for group 01:











Results for group 2: