THE EFFECTS OF APPLIED VERBAL BEHAVIOUR APPROACH "AVB" IN TEACHING CHILDREN WITH AUTISM

A thesis submitted for the degree of Doctor of Philosophy

By

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June 2009

Acknowledgements

I would like to express my gratitude to all the people who have helped me and supported me to finish this thesis. I would like to thank:

- Professor Roy Evans, my supervisor. I would like to thank him for his endless support and guidance.

- Doctor Jones for her valuable comments and support during the first draft's discussion.

- My family mainly Dr. Hussein, Sam, Ali and Ryan. For starters, without Hussein's endless support, time, tutorial and patience, I wouldn't have made it. While as for Sam, for accepting on cutting down on all our mother-daughter activities and encouraging me to finish my thesis once and for all. Ali who gave me the idea in the first place to start this research. Seeing him thriving and becoming a handsome teenager, while coping with the diagnosis of Autism and overcoming major difficulties, he's given me the determination to keep moving forward. And finally Ryan, the baby in the family who brought happiness and joy into our home.

- The Autistic Centre: Children, staff and parents and the Board of Trustees for their participation, time, energy, enthusiasm and support.

- Study Group: I can't thank them enough for their useful comments on early drafts which were of a great help.

Abstract

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WITH AUTISM

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March 2009

The idea which has initiated this research came firstly from being a mother of an autistic child and secondly, being an experienced Applied Behaviour Analysis/Applied Verbal Behaviour "ABA/AVB" therapist working with children with autism and related disorders. It has been the researcher ambition for some time to study the effects of implementing an ABA/AVB programme on children with autism, and to report on their performance.

The previous and current research has shown the importance of an early intervention in teaching children with autism. However, finding an appropriate intervention for an individual with autism is still debated among parents and professionals. Previous research has highlighted the importance of an ABA programme using the Lovaas model programme in teaching children with autism. No wider research on the AVB model has been conducted. This has led the researcher to investigate this issue further. This research has taken place at "The Autistic Centre" in Beirut.

This research is the author's attempt to study the effects and the impacts of implementing an AVB programme on children with autism. Children's performance on specific skills will be assessed, evaluated and reported by four parties:
1. The researcher.
2. The independent psychologists.
3. The teachers.
4. The parents.

The research used a combination of quantitative and some qualitative methods. The AVB Intervention used for this study was based on multiple baseline design across behaviour, participants and settings. The different use of methods for this research has contributed to the methodology, by using different methods to collect data and involving many parties who can evaluate the children's performance and report their progress from their own perspectives.

The present study demonstrated the efficiency of the AVB programme with ten children with autism. Its effects have been clear on the emergence of speech, collateral gains in social communicative behaviours and decrease of problems behaviours and the decrease of parental level stress.

This research also proposed several key suggestions based on the literature review and the research undertaken. It has also contributed to knowledge of the current research regarding the implementation of an AVB Programme as an educational provision and its effects on the child and the parents.

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Chapter 1- Introduction to the Study

The purpose of this introductory chapter is to clarify the ideas which initiated this research and formed the foundation of this study. It concerns the improvement in the learning strategies of children with autism. This research will study the effects of implementing an Applied Verbal Behaviour Intervention "AVB" on children with autism in the areas of academic functioning, language functioning and adaptive functioning. Children's performance on specific skills will be assessed, evaluated and reported by four parties:

1. The researcher
2. The teachers.
3. The parents.
4. An independent psychologist.

A brief analysis of the above themes and issues will lead to the research purposes and the justification of this study. Finally, the chapter will end with a summary of the structure of the thesis.

1.1 Researcher's Relationship with the Research

This section describes how the research coincided with the researcher's primary interests, which is in the field of autism and Applied Behaviours Analysis/Applied Verbal Behaviour "ABA/AVB" she has been working in the field of autism and Applied

Behaviour Analysis for over 12 years. The idea of this research initiated from the fact that the researcher had been using the ABA/AVB programme for more than 12 years to deal with her autistic son. In addition, she is an experienced therapist in training others to implement such a programme for children with autism and related disorders. Having worked with hundreds of young children with autism, the researcher has regularly witnessed the impact of applying an ABA/AVB programme on children with autism and their families. It has been the researcher's ambition for some time to study the effects of implementing an ABA/AVB programme on children with autism.

To conduct this research, "The Autistic Centre" was established in 2004 by the researcher and a team of professionals (psychologist, social workers and Paediatrician). The Autistic Centre was attached to a mainstream school (for more details about The Autistic Centre see section 1.4).

The researcher's role at "The Autistic Centre" was to:

- Assess the children pre and post AVB intervention.

- Train staff and parent on how to implement an AVB programme.

- Monitor the implementation of the AVB programme at the Centre.

- Measure parental stress level pre and post AVB intervention.

The researcher's work and contribution at "The Autistic Centre" was voluntary and she did not get paid for it.

1.2   Current Research

Autism is a complex developmental disability that affects the way a child communicates and relates to the world around him/her. It is a spectrum disorder (Wing, 1971). Impairments are seen in three areas: social, communication and behaviour. This Triad of Impairments affects the children at different degrees. Those with severe autism are anti-social, extremely aggressive and have great difficulties when it comes to communication skills. On the other hand, the high functioning autistic children have average or above average intelligence but also have major social difficulties.

Autism has been receiving the media's attention at present which is due to the publicity of possible causes and treatments of this disorder. In addition, the rate of children diagnosed with autism has increased vastly over the years.

Parents and professionals are faced with vast information on treatments and approaches which are offered for autism. Their search for information on the internet for example, might put them at risks of confusion as only few of the approaches have been evaluated and backed up by research.

Parenting a child with autism is stressful (Konstantareas, Homatidis et al., 1992; Siberg, 2002). Many parents' stress level is high which might be a result of the lack of effective communication approach with their autistic children. Finding the appropriate approach is highly requested by parents (Tissot, 2003).

The current research has shown the importance of an early intervention in teaching children with autism (Fenske, Zalenski et al., 1985; Howlin, et al., 2009). However, finding an appropriate intervention for an individual with autism is still debated among parents and professionals. Previous research has highlighted the importance of an Applied Behaviour Analysis "ABA" programme using the Lovaas model programme in teaching children with autism. The success rate of using Lovaas model was 47% (Autism Research Review International, Volume 1-7, 1987-1993). The replication studies of the Lovaas outcomes vary between 25 to 35% (Smith et al. 2000; Handleman and Harris, 2001; Cohen, et al., 2006). However, the author of the 2005 replicating study, Dr. Sallows states, *"We found that 48% of all children showed rapid learning, achieved average post-treatment scores, and at age 7, were succeeding in regular education classrooms. These results are consistent with those reported by Lovaas and Colleagues"*. (Sallows & Graupner, 2005, p. 417-438).

No wider research on the Applied Verbal Behaviour "AVB" model has been conducted. This has led the researcher to investigate this issue further. The reader is reminded that the researcher is an experienced ABA/AVB therapist and a mother of a child with autism.

1.3   Applied Behaviour Analysis ABA

Applied Behaviour Analysis "ABA" is the science of applying experimentally derived principles of behaviour to improve socially significant behaviour. It takes what we know about behaviour and uses it to bring about positive changes (Applied). Behaviours are defined in observable and measurable terms in order to assess change over time

(Behaviour). The behaviour is analyzed within the environment to determine what factors are influencing the behaviour (Analysis). (Lovaas, 1987; Cooper et al., 2007; Wikipedia, the free Encyclopaedia).

In 1938 Skinner published The Behaviour of Organisms, which he described operant conditioning the process by which learning occurs as the result of selection by consequences of behaviour. Skinner clarified the distinction between Ivan Pavlov's respondent/classical conditioning (conditioned reflexes) and operant conditioning, in which the consequence behaviour controls the future occurrence of the behaviour.

1.3.1. Classical conditioning (Pavlov)

Classical conditioning is a form of associative learning that was first demonstrated by Ivan Pavlov. The typical procedure for inducing classical conditioning involves presentations of a neutral stimulus along with a stimulus of some significance. The neutral stimulus could be any event that does not result in an overt behavioural response from the organism under investigation. Pavlov referred to this as Conditioned Stimulus (CS). Conversely, presentation of the significant stimulus necessarily evokes an innate, often reflexive, response. Pavlov called these the Unconditioned Stimulus (US) and Unconditioned Response (UR), respectively. If the Conditioned Stimulus and the Unconditioned Stimulus are repeatedly paired, eventually the two stimuli become associated and the organism begins to produce behavioural response to the Conditioned Stimulus. Pavlov called it Conditioned Response (CR) (Pavlov, 1927/1960).

The most famous example of classical conditioning involved the salivary conditioning of Pavlov's dogs. During his research on the physiology of digestion in dogs, Pavlov noticed that rather than simply salivating in the presence of meat powder (Unconditioned Response), the dogs began to salivate in the presence of the lab technician who normally fed them. Pavlov called these psychic secretions. From this observation he predicted that if a particular stimulus in the dog's surroundings were present when the dog was presented with meat powder, then this stimulus would become associated with food and cause salivation on its own. In his initial experiment, Pavlov used bells to call the dogs to their food and after a few repetitions, the dogs started to salivate in response to the bell. Thus a Neutral Stimulus (bell) became a Conditioned Stimulus (CS) as a result of consistent pairing with the Unconditioned Stimulus (US: meat powder). Pavlov referred to this learned relationship as a conditional reflex which is now called Conditioned Response (CR).

1.3.2. Operant Conditioning

Operant Conditioning is the use of consequences to modify the occurrence and form of behaviour. It is distinguished from classical conditioning (Pavlov) in that operant conditioning deals with the modification of "voluntary behaviour" or operant behaviour. "Operant behaviour "operates on the environment and is maintained by its consequences, while classical conditioning deals with the conditioning of respondent behaviours which are elicited by antecedent conditions. Behaviours conditioned via a classical conditioning procedure are not maintained by consequences. (Domjan, 2003).

Skinner outlined basic principles of behaviour, which include reinforcement, prompting, fading, shaping, schedules of reinforcement, etc… These principles comprise the pure science of behaviour (Skinner, 1957). The distinction between pure behaviour science and the Applied Behaviour Analysis "ABA" is made when any science is studied in both pure and applied ways. When the principles of pure science of behaviour analysis are used to teach (used in applied setting), the practice is called "Applied Behaviour Analysis". The science of behaviour is made up of these principles of behaviour. The applied behaviour analysis is made up of strategies based on those principles.

Interventions based on ABA focus on teaching tasks one-on-one using the behaviourist principles of stimulus, response and reward/reinforcement, (Howard, et al, 2005) with reliable measurement and objective evaluation of the observed behaviour (Myers, 2007). There is a wide variation in the professional practice of behaviour analysis and also among the assessments and interventions used in school-based ABA programs (Steege et al., 2007). Many ABA interventions rely heavily on Discrete Trial Teaching (DTT) methods, "the three contingency model" which use Discriminative Stimulus (SD) - Response (R), - and Reinforcement (SR) techniques to teach foundational skills such as attention, compliance, and imitations. However, children with autism have problems using DTT in order to learn skills in natural environments. (Myers, 2007).

There are different applications of the ABA Programme such as the Lovaas model and the Applied Verbal Behaviour "AVB" model (for detailed information, see chapter 2 and chapter 4).

1.3.3. Lovaas

A Lovaas technique (model) is a form of treatment guided by applied behaviour analysis. Lovaas model is a therapy for children diagnosed with autism or related disorders. The technique consists of an intensive behavioural intervention which is carried out early in the development of autistic children. It involves Discrete Trial Teaching DTT, breaking skills down into their most basic components and rewarding positive performance. It was also known for its use of aversive punishment towards unwanted behaviours. A Lovaas technique was developed by Ivar Lovaas based on research performed by himself and his assistants (Lovaas, 1987). This research reported that 47% of those children who had received 30-40 hours of intensive therapy per week were mainstreamed into regular classrooms, and were classified "indistinguishable" from their peers in follow up studies. Although, subsequent studies have shown that intensive behavioural therapy (Lovaas Technique) clearly benefited children with autism, Lovaas' original claims of effectiveness were overstated (Francis, 2005).

1.3.4. Applied Verbal Behaviour (AVB)

The term "AVB" has become shorthand for a program of Applied Verbal Behaviour that focuses on teaching verbal behaviour based on Skinner's analysis of language through a collection of teaching procedures taken from the science of behaviour analysis.

In Verbal Behaviour, Skinner outlined his analysis of AVB, which describes a group of verbal operants, or functional units of language. He explained that language could be analysed into a set of functional units, with each type of operant serving different function. The primary verbal operants are echoics, mands, tacts, and Intraverbals, and textual (See chapter 2 and chapter 4).

Skinner developed the premise that Verbal Behaviour (behaviour under the control of consequences mediated by other people who can interchange functions as speaker and listener) was best understood in a functional analysis (Skinner, 1957). This theoretical extension was a direct product of his basic research using what he referred to as "the three contingency model" with the basic behavioural unit being the response and its consequences in a specified situation (Antecedent-Behaviour-Consequence: A-B-C model). Skinner described operant conditioning or the process by which learning occurs as the result of selection by consequences of behaviour he also discussed how Antecedent stimuli, when correlated with the function altering effects of consequences, also alter future occurrences of that behaviour. This is known as a three term contingency/model (A-B-C), the basic unit of analysis of behaviour was the first description of Discrete Trial Teaching "DTT".

AVB model is now sometimes called "the four term contingency model" with setting conditions added as a fourth term. (Bijou, 1978; Morris, 1992). This consists of a Motivating Operation/Establishing Operation (MO/EO), Discriminative Stimulus (SD), Response (R), and Reinforcement (SR). However, the four-term model post dates

Skinner's work having arisen most notably in the writings of Dr. Jack Michael (1982). Skinner refers exclusively to the three term model without Motivating Operation/Establishing Operation (MO/EO) as such, despite the fact that Skinner does refer to the states of deprivation and satiation which are essentially the same thing which the Motivating Operation's term encompasses and extends upon.

AVB is more than DTT, more than structured teaching. Students with autism need to learn in all environments. Environmental contingencies have a lot to do with stimulus control. In order to generalize easily, generalization must be built into the teaching setting from the beginning, and the way to do this is with Natural Environment Teaching (NET). AVB model involves both NET and structured teaching DTT, as there are some skills which are difficult to teach first in the natural environment such as academic skills. They need to be taught using DTT and be generalized in the natural setting.

The previous research on ABA (Lovaas Approach) was conducted as an experimental research (controlled and randomised groups). Using the experimental research method in order to study the effects of an AVB programme on the children's academic functioning, language functioning and adaptive functioning was not possible and that is for different reasons: Firstly, because of the small number of children that participated in the study in the first year of the research (only 3 children were enrolled). Secondly, it was quite difficult to find a comparison group to match the control one. Therefore, an intervention study (the multiple baseline design) was more appropriate to use, than randomized experimental research, because this method has led the researcher to study in depth, the

effects of an AVB Programme, on each child participated in this study pre AVB and post AVB intervention. In addition, the multiple baseline design was used for this study (across setting, behaviours and participants), the AVB intervention was introduced to different baselines at different points in time, and a functional relationship is demonstrated if the behavior changes only when the intervention is introduced. The multiple baseline design has helped the researcher to show that behavior only changes when the AVB intervention is introduced, in order to rule out the possibility of the extraneous factors/variables that might influence the findings.

1.4   The Autistic Centre

Research has taken place in "The Autistic Centre" which is an attached "day unit" in a regular school in the suburb of Beirut in Lebanon. The purpose of establishing the unit in the first place was to respond to the evident needs within Beirut despite the violence and instability there, and to develop an educational provision for children with autism. Provision for children with autism in Lebanon is more than inadequate. Therefore, the Autistic Centre will add to the provision available and also broaden the scope of provision in the area.

Lebanon went through 15 years of civil war (1975-1990), followed by over a decade of post-war reconstruction. Reconstruction was taking place in a period of regional conflict and changes in trade arrangements, and was funded by an increasingly unsustainable public debt: payments now account for almost half the government budget. The Lebanese government has pushed forward with tight monetary policies, privatisation and tax

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reform. The government has cut investment in education, health and social welfare. Cuts to education budgets have meant that Lebanon has not been able to provide basic education to all children, promised in the 1998 education law.

In February 2005, the situation in Lebanon worsened after the assassination of Rafic Hariri (the former Prime Minister of Lebanon). This came just at a time when the Lebanese were congratulating themselves on recovering some degree of stability after the end of the bloody civil war. Lebanon was faced with a new period of instability as more assassinations of parliament's and government's members occurred after the Hariri's assassination. The Lebanese government's first priority was to gain some degrees of stability in the country while education, health and social welfare were not on its current agenda.

Disabled children in Lebanon have rights to education, set out in domestic laws on disability (law 220, decree 1834, 2000) and education (law 686, 1998). According to this legislation which is one of the most progressive in the Middle East, it addresses the rights of people with disabilities to education, employment, rehabilitation services and reduced tariff for public transport, visits to archaeological and touristic places, theatres and other facilities. However, this is far from being applied in reality. For example, even though the Lebanese Disability Law 220 clearly stipulates the necessity of making at least public premises physically accessible, there is a generalized lack of physical accessibility in Lebanese society. Furthermore, while the legislation clearly indicates that a person who is issued a disability card (from the Ministry of Social Affairs) can use any hospital in

Lebanon without being charged a penny. However, all the Lebanese hospitals are refusing to admit patients with a disability free of charge despite the fact that their acts are against law 220, bearing in mind that the medical services in Lebanon are extremely expensive and beyond the majority of Lebanese citizens' reach.

In Lebanon, most mainstream schools exclude children with disabilities. As a result, most disabled children miss out on education altogether. The minority of children with disability, who can get an education, pay a heavy price (very expensive school's fees). They are educated in special institutions that run by 46 non governmental organizations (NGOs) which provide education for 4758 disable children in Lebanon. Institutions isolate disabled children from ordinary life. About half the disabled children in institutions are separated from their families and are in residential institutions (Lakkis, 2003).

The population in Lebanon is estimated at 3.5 million. Lebanese Physically Handicapped Union "LPHU" house held surveys over the past seven year, conducted according to the World Health Organisation's definitions. The yielding disability rates were around 4 % or 140.000 people. Official studies, using local definitions have yielded lower rates (Disability in Lebanon: A Statistical Portrait, 2007). LPHU's study also shows that expensive institutions do not educate children effectively; confirming similar findings in international studies (Tobis, 2000). In 2001, the Lebanese Ministry of Social Affairs (MOSA) spent an average of $1.762 on each disabled child in institutions (Lakkis& Thomas, 2003).

In Lebanon there are no official statistics of the numbers of children who are affected by autism. However, according to the Ministry of Social Affaires there was an estimate of 60.000 people suffering from disability in general and that includes people with autism which was classified as mental retardation[1] (Disability in Lebanon: A Statistical Portrait, Community Development Project, 2007). The study was supported by UNICEF and conducted in December 1994 estimated that there were 110.000 disabled persons in Lebanon, of whom 53.000 were below the age of 18 years (UNICEF, 1995). The provision for children with autism within public and private education reflected a care perspective with little or no emphasis on the education potential of a suitably structured programme. The kind of provision available for children with autism depends on where are they on the Autistic Continuum. Usually only high functioning autistic are academically integrated in the mainstream classes while the severely autistic children are placed in special classes and separated from typically developing children.

1. 4.1. Aims and objectives of The Autistic Centre

- To offer early intensive AVB intervention for pre-school and primary aged children.
- To offer an approach to learning based on the principles of Applied Behaviour Analysis using the Applied Verbal Behaviour model.
- To provide a curriculum which meets each child's individual education plan.
- To offer access to the national curriculum where appropriate.

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[1] Mental retardation is a term still used in USA and also in Lebanon.

- To enable children, when possible, to integrate into mainstream schools.

- To provide parent education and build partnerships between parents and staff.

- To spread awareness about autism and related disorders.

- To provide a safe, caring enjoyable environment where children can thrive and grow towards independence.

- To provide a training and development programme for teaching staff leading to a recognized qualification at post graduate level from an established university in the United Kingdom.

- To set up a vocational training for older children with autism and related disorders.

- To provide a home-based programme for children who can not attend the school.

The founding principle is to enable each child who comes to The Autistic Centre to achieve their full potential in a safe, caring and enjoyable environment. The Centre will still be pursuing goals for integration and will continue to raise awareness for autism and broaden the scope of provision currently available. Its objective is to continue to demonstrate what kind of progress can be made using the AVB programme and to strive to develop skills that will enable each child to be included and where possible integrated into a mainstream setting.

1.4.2. Teaching Method at "The Autistic Centre"

AVB is the main teaching method at the centre. It is a structured teaching programme built on a discipline devoted to the understanding and improvement of human behaviours.

The Autistic Centre uses AVB programme to deliver a broad curriculum in line with each child's Individual Education Plan "IEP". Research into ABA has shown a direct correlation between the expertise of teachers and the eventual outcome of children. Therefore, the staff and parent's training is an integral part of ABA/AVB programme. The staff is trained in both the theoretical and practical approach to deliver an ABA/AVB programme (see chapter 4).

Every child accepted by the centre would already have a diagnosis of autism. As part of The Autistic Centre teaching system, every child has an Individual Education Plan "IEP" which links with the national curriculum. Each child's teaching programme involves breaking down tasks into learnable elements and teaching them until mastery is achieved. The child is constantly rewarded for desired behaviours with systematic use of Positive reinforcement, praise and positive pairing techniques (see chapter 4 for more details).

Each element of the teaching process is continuously charted and assessed. This enables staff to identify strengths and weaknesses and to help the child progress in a positive and targeted direction.

The Centre's curriculum also includes art, music and dance and there are regular activities for indoor and outdoor play.

Staff and parents at The Autistic Centre receive intensive training using the AVB manual: Teaching Language to Children with Autism or Other Developmental Disabilities by

Sundberg & Partington, (1998). The staff's skills are assessed on ongoing basis to ensure that the standards are maintained. The training of the Staff is an integral part of The Autistic Centre system which believes that investing in the staff is investing in the child's future.

The researcher's main objective in The Autistic Centre was to confirm the diagnosis of children with autism before enrolling them, followed by the diagnosis of their learning needs. The team which involves the researcher, the teachers and the parents at The Centre put the best practice from a variety of establishment sources together in order to provide an Individual Educational Plan "IEP" experience.

This study tracks these children over a period of 2 years, monitors their performances at fixed intervals and provides summative overview of the progress made by each individual child in response to the programme.

After a significant period of planning which elevated discussions concerning the principle basics of the intervention, the researcher made sure that the team had the core skills in order to deliver the chosen "AVB" approach in coherent consistent and reliable manner (see chapter 4 for more details).

As will be discussed later, the children were recruited to the programme using the snowballing routines i.e. number of children enrolled increased year by year to a maximum of ten children.

1.5   Researcher's Aims of the study

To pursue the research's objective, the researcher aims were to limit the investigation to study the effects of implementing an AVB programme on children with autism for the following reasons:

- The researcher is a trained and experienced ABA/AVB therapist which allows her to train the teachers and the parents in implementing the AVB programme.

- There are few centres in Lebanon which provide provision and services for children with autism. The quality of the services was in the area of providing cares and accommodation but the use of structured educational provision was limited.

- One of the centres in Lebanon which is run by a Lebanese Society was interested in this study but unfortunately, a new president for the society was elected who did not give consent for the researcher to conduct the study at their centre.

- The researcher and a team of professionals (psychologist, social workers and Paediatrician) have established an Autism society "The Autistic Centre" in Lebanon in order to implement The AVB program. The Autistic Centre was attached to a mainstream school.

At The Autistic Centre, teachers and parents were trained by the researcher in order to implement the AVB programme and to conduct assessment of the children using the relevant tests (for more details see Chapter 4).

1.6   Research Questions

The main theme of this research is to study the effects of implementing an Applied Verbal Behaviour Intervention "AVB" on children with autism in the areas of academic functioning, language functioning and adaptive functioning. Children's performance of specific skills will be assessed, evaluated and reported by four parties:

1. The researcher, who is going to assess the children's performance using: The Behavioural Language Assessment Form "The BLAF" and: The Assessment of Basic Language and Learning Skills "The ABLLS". Both assessments are designed by Partington & Sundberg (1998). In addition, the researcher will measure the parental stress level using Parenting Stress Index "PSI" Short Form (Psychological Assessment Resources Inc, 1995).

2. The teachers will report on the children's performance using the questionnaire which was designed by the researcher.

3. The parents will use the same questionnaires as the teachers in order to report on their children's performance.

4. The independent psychologist will use Childhood Autism Rating Scales (C.A.R.S) which is designed by Eric Schopler et al., (1988). CARS help to identify children with autism and determine the severity of symptoms through quantitative rating based on direct observation. For this research CARS was conducted by an independent psychologist in order to measure the children progress in different areas of functioning. The enrolled children at The Autistic

Centre were assessed by an independent psychologist, by using CARS before enrolling them at the Centre (baseline assessment: pre-AVB) and again at the end of the academic year (post-AVB). The independent psychologist is based in a leading hospital in Lebanon who offers a diagnostic assessment service for children with disabilities including autism. In addition, most of the participated children in this study had a CARS assessment which was conducted one year before enrolling at the Centre (children were attending different centres).

This study was set out with two aims:

- The first aim is to study the effects of implementing an Applied Verbal Behaviours Approach "AVB" on children with autism regarding the children's academic functioning, language functioning and adaptive functioning.

- The second aim is to study the effects of implementing the AVB Programme on the children's parents by measuring their stress level before and after the AVB intervention.

The first aim will be investigated through four main questions as follows:

1. Is AVB effective in teaching children with autism in the areas of Basic learner Skills, Academic skills, Social skills, Self-help skills and Gross Motor skills?

2. Is AVB only effective as an early intervention?

3. Will the children be more co-operative with teachers/parents requests while receiving AVB?

4. Is AVB an effective way to reduce mal-adaptive behaviour?

In order to answer the research questions, all the mentioned tests and forms will be used to indicate the progress or lack of progress of the participated children during the implementation of an AVB programme in the areas of the basic learner skills, social skills, self-help skills and Gross and fine motor skills.

To answer the second aim of this research, the Parenting Stress Index "PSI" Short Form which is designed by Richard R. Abidin, (1995) will be used in order to measure the parental stress level. As children with autism have a deficiency in communicating their needs in an appropriate way, parents are found puzzled of how to communicate and relate to their autistic children which consequently adds to their stress level

1.7 The Structure of the Study

The structure of this work follows the themes and research aims of this study; therefore, chapter 2 reviews the current knowledge on autism, educational provision, and treatments. It identifies the gaps in the literature and justifies the research questions. Chapter 3 discusses the methodology used for the research. Chapter 4 is to look in depth at the curriculum strategies, individual assessment and programme delivery, and to describe the implementation of an AVB Programme in The Autistic Centre.

The summary of results chapter is a major section to the reader which presents the outcomes of the AVB intervention. Therefore, it is going to be divided into 2 major

chapters, chapters 5 and 6 will describe the outcomes of the intervention study by presenting and analyzing the findings of the children's progress and performance by the independent agency and the researcher, their teachers and parents and then followed by a comparison of the results of both teachers' and parents' questionnaires.

Chapter 7 will draw together and will discuss the findings of the previous two chapters in order to measure the children's progress and performance by the researcher, the independent agency, their parents and their teacher's.

Chapter 8 will draw a conclusion out of the outcomes of this study. It will cover the following issues: research recommendations, contributions to the research, suggestions for further research, and research limitations.

The next chapter will review the relevant issues related to autism, and it will identify gaps in the literature.

Chapter 2- Literature Review

The aim of this chapter is to explore relevant issues related to autism. This research uncovers issues of areas of general agreement and areas of disagreement among researchers and professionals regarding autism. This literature review will investigate the history of autism, the triad of impairments, the classification of autism, the importance of early intervention, and early warning signs of autism, how children acquire language and their communication development, the core symptoms in autism, and the parental stress.

It will also cover issues related to the theoretical framework of language development, the aetiology of autism which refers to the cause of autism and possible factors. The prevalence of autism, this is an issue that is receiving lots of publicity regarding the fluctuation in numbers of autistic population. And lastly but not least, the interventions strategies, this section refers to the vast choices of intervention strategies for parents and professionals to choose from. This would raise a question as which strategy is more effective to the child's needs. The chapter concludes by a summary to identify relevant gaps in knowledge which justifies the research questions that are related to this thesis.

This literature review shows the importance of an early intervention in teaching children with autism (Fenski, Zalenski et al., 1985). However, finding an appropriate intervention for an individual with autism is still debated among parents and professionals. The research highlighted the importance of an Applied Behaviour Analysis "ABA"

programme in teaching children with autism and related disorders. There are different applications of ABA programme such as the Lovaas model and the Applied Verbal Behaviour model AVB. In the second half of the 1990's the Lovaas model has been widely known in the UK. However, AVB model has recently been popularised in the UK and many families are switching from the Lovaas model to the AVB model. The increased usage of the AVB approach when teaching children with autism led the researcher to study this issue further, in order to examine the effects of implementing an AVB programme on children with autism regarding their academic functioning, language functioning and adaptive functioning. In addition, this research will study the effects of implementing the AVB Programme on the children's parent by measuring their stress level before and after the AVB intervention.

2.1 Areas of General Agreement

This literature review provides the reader with a background to some of the existing knowledge about autism. It shows five areas of general agreement. These areas are the history of autism, the triad of impairments, the classification of autistic spectrum, the importance of the early intervention and the parental stress. In order to pursue the research objective, the above issues are examined to highlight when the symptoms of autism started to become to be recognised. It gives the description of the characteristics of autism and its classification and several subtypes of the disorder. It demonstrates the impacts of an early educational programme on the life of a child with autism. This section will also highlight the issue of parental stress for children with autism.

2.1.1 History of Autism

The first area of the general consensus is to look at the history of autism. Throughout history, people have probably lived with what we call today as Autistic Spectrum Disorders" ASD". The earliest published descriptions of behaviour that resemble autism dated back to the 18th century. In 1801 a Frenchman named Itard wrote an account of 12-year-old boy who had lived for some time in the wild. Itard decided to name the boy Victor. Victor made no direct verbal communication and was very self-absorbed. Itard assumed that Victor had grown up without any form of human contact. Victor never spoke, and would gesture if he wanted or needed something. He wanted items to be in the same place constantly and would also be very unhappy until an object was moved back to its former place. All Itard's papers were published and were called the 'Wild Boy of Averyon".

> *"Autism is not a modern problem even though it has only been recognized in modern times. In view of the short history of psychiatry, and the even shorter history of child psychiatry, we know that a disorder recently described is not necessarily a recent disorder. An increase in diagnosed cases does not necessarily mean an increase in cases." (Frith, 1989, page 16)*

The term autism is believed to have been first introduced around 1911 by a Swiss psychiatrist, Eugene Bleuler, who used the term to describe individuals exclusion of the outside world and virtual withdrawal from social life. The words "autistic: and "autism" developed from the Greek word "auto" meaning "self".

Kanner had first described autism as a specific condition; he published his famous paper on the disorder in 1943. "Autistic Disturbances of Affective Contact" (Kanner, 1943) and follow up (Kanner, 1971). In this paper Kanner describes 11 children all with similar

characteristics. He states that the children "have an inability to relate themselves in the ordinary way to people and situations from the beginning of life (Kanner 1943, p. 242) he continues describing the children as "dread of change and monotonous repetitiousness (ibid, p.246).

Kanner (1943) suggested that autism is associated with faulty parenting. He stated that "In the whole group there are very few really warm-hearted fathers and mothers (ibid, p.250). Kanner had a significant impact on the education of children with autism during the 1950's and the 1960's (Howlin, 1997a) as there were lacks of provision for children with special needs.

Asperger of Vienna, Austria, published another famous paper which described a similar condition as autism that later became known as Asperger's syndrome. These landmark papers provided the first theoretical attempts to explaining these complex disorders.

The work of Asperger (1944) did not become well known until the end of the 1980's when his book was translated into English.

The work of Kanner had led Bruno Bettelheim to use psychoanalysis as a treatment choice for autism (see Bettelheim, 1943; Bettelheim, 1967; Pollock, 1997). (Bettelheim's work will be discussed later in psycho-analysis section).

Kanner and Bettelheim's works were quite often confused as it was generally accepted that autistic children had frigid mothers (Bettelheim, 1943; Bettelheim 1967). For quite a long time, autism and psychosis continued to be confused. For many years after Kanner first described the disorder, autism was wrongly believed to be an emotional disorder, caused by bad parenting. This led an entire generation of researchers in the wrong direction and resulted in an entire generation of children with autism to be deprived of benefiting of the medical and scientific research. (Rimland, 1964). The work of Kanner and Bettelheim had been disputed and labelled "harmful" by current practitioners (Happe, 1995; Smith, 1995, p. 52).

However, Dr. Bernard Rimland, (1964) a research psychologist, uncovered issues related to autism in his book: "Infantile Autism: the Syndrome and its implications for a Neural Theory of Behaviour". Rimland's work is responsible for changing the idea regarding autism, from an emotional disorder or "blame the mother" orientation, into its current label as a biological disorder which is not caused by bad parenting. This book changed the way autism was perceived and had a significant impact on the future of the treatment methods for autism (Shaw, 1998).

For many years researchers looked for the underlying cause of autism, but they realized that this disability was more complex.

2.1.2 Autistic Disorder: The Triad of Impairments and Difficulties

The second area of the consensus looks at the triad of impairments. That is to say that

Autism is classified by The Diagnostic and Statistical Manual of Mental Disorders fourth edition "DSM-IV" (See appendix A) as a pervasive developmental disorder, a term which indicates "severe and pervasive impairments in several areas of development such as: reciprocal social interaction skills, communication skills, or the presence of stereotyped behaviour, interests, and activities (DSM-IV, 1994). All the children with this condition will be affected by a range of impairments, which includes all or some of the following (some examples below are provided by parents and professionals):

Qualitative impairments in social interaction: Children with autism have difficulties and problems with social relationships, often appearing inappropriate or paying little attention to others. Catherine Maurice in her book "Let Me Hear Your Voice" describes the social isolation of her daughter:

> *"Anne Marie was not shy, she was largely oblivious to people, and would sometimes actually avoid them, including a lot of the time, her own mother. She drifted toward solitary spaces: the corners of a room, behind the curtains, behind the armchair. If I was somewhere else in the apartment she never sought me out…" '(Maurice,. 1993, p.31)*

Qualitative impairments in Communication: Children with autism have difficulties with social communication such as problems in developing speech or meaningful communication, such as understanding gestures or facial expression. Some researchers have proposed a link between the inabilities of an autistic child's ability to express his/her needs or understand when others express their needs, and the disruptive behaviour by the autistic child. The most frequently cited example in the literature is aggression (for example, see Schopler and Mesibov, 1995; Koegel and Koegel, 1995; Howlin, 1998; Cohen, 2002), Cohen states that "lack of an effective communication system is associated

with increased tantrums, aggression, and even self-injury" (Cohen, updated edition 2002, p. 109). Craig Schulze is an educator with a PhD in human development who son was diagnosed with autism and he describes his son's speech without communication:

> *"I then enter the room carrying Jordan's dinner." put it on the table." He blurts out when he sees his food. It's a remark he's been making four times a day (during meal times and his snack) for over two weeks. He doesn't seem to really care where I put the food since he darts away from me the minute I'm in the room. Like so many of his most recent utterances, this habitual response seems more a ritual than an attempt at communication. It's spoken in a loud monotone with almost no emotion.* **(Schulze, 1993, p. 105).**

The language's of children with autism are quite literal, as Jason's mum describes her son's language:

> *"He called himself a "horse boy" rather than a cowboy because he rode a horse, not a cow. If Jason was asked if he was feeling "sick too", he replied "yes, I am three-sick". Jason says that his balding father has "five heads" which must be bigger than a forehead." (Stehli, 1995, p.2).*

Restricted repetitive and stereotyped patterns of behaviours interests, and activities:

Children with autism have difficulty with developing imagination, such as having problems in developing imaginative play or having a limited range of repetitive and rigid play skills. Judith rapoport in her book *"The boy who couldn't stop washing: The experience and treatment of obsessive compulsive disorder"* uses one parent description of his four-year-old son's repetitive fixed routine, which is often found in children with autism. He said:

> *"I went to father's night at my Jeffrey's pre-school. He was playing with a Fisher-Price toy, a schoolhouse, but his play was strange. He stood before the toy, jumped up and down, and flapped his arms as if excited it … When the jumping stopped, he would put his arms together and wiggle his fingers just above eye level… he did this for 35 minutes".* **(Rapoport, 1989, p. 29).**

In addition to the Triad of Impairments, it seems that children with autism have shown impairment in sharing the mental state of the non-impaired:

Theory of Mind

Theory of Mind refers to the notion that people with autism do not understand that other people have their own plans, thoughts and points of view. As consequences of the impairments of their ability, they behave as if they don't share a similar conception or to share a mental state the non-impaired have. The theory of mind deficit could be responsible for some of the behaviours of autistic children such as their inabilities to read the intentions or reactions of other people as described in the example below:

> *"Samantha, a ten year old girl with autism attending a mainstream school, was deliberately teased by the children there, and frequently they would tell her to perform some unacceptable act, such as taking her clothes off in the playground. She was quite bewildered by the laughter that ensued… believing that her compliance would result in them becoming "her friend". (Cohen, et al., 1993, p. 467).*

This phenomenon has been explained by a research data which indicates that somewhere between 40 and 80% of the autistic population cannot predict the beliefs of others on the same tests passed by typically developed children and mentally retarded children of the same mental age. (Cohen, 2002).

In retrospect, not all autistic children do exactly as the children described above (see Appendix A for the specific combinations of behavioural indicators that professionals use to obtain a diagnosis of autism). The following indicates other reasons for which autistic children might experience

Sensory Problems is seen as another type of difficulties which might appear in children with autism, as Jason's mum describes:

> *"Jason's sensory system was clearly different. From the time he was a baby; he would crawl into my closet and rub silky blouses or dresses on his face when he was upset. At first we worried that he would grow up to become a cross-dresser. If the priest patted Jason on the head at church, Jason would loudly protest,"Owey, you hurt-my hair." During Jason's first haircut at the age of seventeen months, he screamed so hard that he broke blood vessels in his neck. Jason found light touch irritating." (Stehli, 1995, p. 3).*

Autistic children have trouble recognising emotional expressions (Dichter & Belger, 2007).

Autism is a spectrum disorder with symptoms ranging from mild to severe. It is a complex developmental disability that affects the way a child communicates and relates to the world around him/her.

Autism usually appears within the first year of life but 35% of the time it appears within the second or third year (Cohen, 1998). Why are there any differences in time of appearance of autism? That question could be answered when we find out more about the causes of autism.

Autism is largely a male disorder, for every autistic girl there are four autistic boys. An autistic girl usually has the severe form of autism with lower IQ (Cohen, 1998). Currently, there is no explanation of this gender difference, although Rett syndrome (or

Rett's disorder) is virtually exclusive to females and shares many features with autism

disorder.

2.1.3 Classifications of Autistic Spectrum Disorders

Autism is a profound developmental disorder that severely impairs a person's abilities,

particularly in the areas of communication and social reactions. Autistic children

typically are normal in appearance and physically well developed. Two children with the

same diagnosis of autism and intellectual ability are more likely to be recognised more

for their differences than their similarities. As stated previously, autism is a Pervasive

Developmental Disorder "PDD". Pervasive Developmental Disorders include Autistic

Disorder, Rett's Disorder, Childhood Disintegrative Disorder, Asperger's Syndrome and

Pervasive Development Disorder/Not Otherwise Specified "PDD/NOS" (Johnson &

Myers, 2007). Several subtypes of this disorder have been identified. It is very common

today for professionals to diagnose autistic individuals as having Pervasive

Developmental Disorder "PDD" or some variation such as Pervasive Developmental

Disorder Not Otherwise Specified "PDD-NOS"

In 1994 The Diagnostic and Statistical Manual of Mental Disorders fourth edition "DSM-

IV" was revised. Slight changes were made to the diagnostic criteria for "PDD", which

includes autism from "a long term stable disorder with poor prognosis" to the more

transient "temporary episodic clinical disorder". This change reflects the fact that there is

a possibility of improvement with interventions. (See Cure Autism Now:

http://www.cureautismnow.org/kb/subcat/3211.jsp).

Listed below are the diagnostic criteria for the five Pervasive Developmental Disorders (PDD), also known as Autism Spectrum Disorders (ASD), as defined by the Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition (DSM-IV), published by the American Psychiatric Association, Washington D.C., 1994, the main diagnostic reference of mental health professionals in the U.S.

a) <u>Autistic Disorder</u> (see section 2.2. Triad of Impairments).
b) <u>Pervasive Developmental Disorder, Not Otherwise Specified</u>
c) Childhood Disintegrative Disorder
d) Asperger's Disorder.
e) Rett's Disorder.

b) Pervasive Development Disorder/Not Otherwise Specified "PDD/NOS"

Children who do not meet the criteria of autism are given the label of PDD/NOS (Appendix B). This label indicates that a child has some of the defining characteristics of autism but not enough of them or not enough intensity of the symptoms associated with autism. A neurologist writes, "Autism is the cancer of the developmental disorders" explaining the reluctance of professionals to use the label "Autism" (Rapin,. 1994) because they feel that it would be a premature and frightening "label" to offer to parents.

This use of PDD/NOS has some negative effects. Sometimes it could lead to increased confusion to parents and could delay the early intervention services for the child. Although this label is considered a very serious diagnosis, it is not as severe as

autism. There are professionals who believe that PDD label should be abandoned all together. Rimland, (1991).

c) Childhood Disintegrative Disorder or Heller's Syndrome

Heller's Syndrome is another pervasive developmental disorder (Appendix C). According to DSM-IV, the essential feature is "a marked regression in multiple areas of functioning following a period of at least two years of apparently normal development." The affected areas are language, social skills or adaptive behaviour, play skills, motor skills, and bowel or bladder problems (control). The sufferers of this condition are usually associated with "severe mental retardation" (DSM-IV, 1994).

d) Asperger's Syndrome or High Functioning Autism

Some professionals refer to Asperger's Syndrome as a subtype of autism. DSM-IV considers it as Pervasive Development Disorder "PDD" distinct from autism, although they share some characteristics including severe impairments in social interaction, repetitive behaviour, interests and activities. According to DSM-IV Asperger's syndrome (Appendix D) is not described as not being marked by severe delays in the development of language, cognition, self help skills, or curiosity about the environment.

e) Rett's Disorder (or Rett Syndrome)

The outstanding feature of Rett's Disorder (Appendix E) is the onset of all the following after the period of normal development.

- Deceleration of head growth between age 5 and 48 months.

- Loss of previously acquired hand skills,

- Loss of social engagement.

- Poor coordination and severe impairment of expressive and receptive language development.

2.1.4 The Importance of Early Intervention

There is no standard treatment for autism; however, Early Intensive Behavioural therapy has been shown to enhance the intellectual, social and emotional functioning in children with autism and related disorders (Eikeseth 1999). Moreover, some children have benefited from the behavioural treatment to the extent that they have been able to successfully pass normal classes in mainstream schools and have moved from the retarded range to the normal range on intellectual tests. Language, social and emotional functioning has maintained their gains several years after the treatment ended (Lovaas, 1987; McEachin et al., 1993).

Educational intervention appeared to be the most effective approach available for autistic children. Temple Grandin refers to her high functioning linked to her early childhood intervention:

"At age two and a half I was enrolled in a nursery school for speech-handicapped children. It was staffed by an older, experienced speech therapist and another teacher. Each child received one-to-one work with the therapist while the teacher worked with the other five children. The teachers there knew how much to intrude gently into my world to snap me out of my daydreams and make me pay attention. Too much intrusion would cause tantrums, but without intervention there would be no progress… I would tune out, shut off my ears. (Grandin, 1995 ed. Schopler & Mesibov, 137-56).

Research indicates that any intervention designed to target an individual with autism is more effective if offered early in life rather than later. Such early teaching interventions promote inclusion in education and society; enhancing the future prospects of the individuals (Departments of Health, 1998).

A number of early intervention procedures have been suggested to offer benefit to some children with autism. Fr example, Nursery provision, and Portage are considered as approaches to managing the problems associated with autism. Both of these approaches are reasonably "cost effective", but both suffer from "deficient evidence-based" with respect to their effectiveness in promoting the child's intellectual, educational and social functioning (Reed et al., 2005, Reed, et al., 2007)

There is wide spread consensus that an educational intervention programme needs to be intensive in order to make a significant progress. ABA has been widely recognized as an effective approach in teaching children with autism. A more naturalistic approach in implementing ABA strategies has increased, comparing it with traditional ABA Lovaas model (Cohen, Updated Edition, 2002).

Debate has cantered on the ABA techniques "the Lovaas model" (Lovaas, 1987). This model uses a discrete trial reinforcement based method. The intervention was initially developed for 40 hours per week. The initial result which was reported by Lovaas (1987) was remarkable. The children undergoing this approach made mean gains of 30 IQ points and just under half of them appeared to recover, that is they were not noticeably different from normal functioning children after 3 years of intervention. There have been numbers of critiques of Lovaas study (1987), many which have focused on problems both with the internal and external validity of his study (Conner, 1998; Gresham & MacMillan, 1997). In terms of internal validity of Lovaas study, it should be noted that different IQ tests were often used at baseline and at follow up. This procedure may well reduce the reliability of the measurement (Magiati & Howlin, 2001). The group selection of Lovaas study was not random. In term of the threats to external validity of the Lovaas study (1987), the reliance on IQ as a measure may be questioned, given that IQ is not necessarily the main problem in the functioning of the children with autism. Despite these criticisms above, it should be noted that there have been a number of further studies on ABA, which have attempted to address some of these issues. Smith, Eikeseth, Klevstrand and Lovaas (1997) studied more severely impaired children and noted only marginal IQ gains. Smith Annette and Wynn (2000) found that a community based treatment led by therapists fared well relative to a parent led approach.

A study by Reed & et al., (2006) at the University of Wales Swansea reported the effectiveness of early intervention programmes for autistic spectrum disorders by

comparing the impact of existing ABA , Special Nursery Placements, Portage and Parents of Autistic Children Training and Support "PACTS " programmes on a variety of aspects of the children's abilities.

a) <u>Applied Behaviour Analysis</u>

The ABA programmes included in Reed's study were provided by a range of organisations, who offered discrete trial Lovaas type interventions (see Lovaas, 1987), discrete trial Verbal Behaviour programmes (see Sundberg and Michael, 2001) and CABAS – based Approaches (see Greer, 1997). The session would last 2 to 3 hours and comprise approximately 8-14 tasks or drills per session, depending upon the particular needs of the child. The task would last typically about 5 to 10 minutes each and would be repeated until some criterion performance was reached. Each task would be separated by a 5 -10 minute break. The programme used an antecedent, behaviour (response) sometimes prompted when necessary followed by consequences (tangible reinforcement/rewards) procedure. No aversive were used in any of the programmes.

b) <u>Special Nursery Placements:</u>

The Special Nursery Placements (Nursery) occurred in a variety of provisions. All were in Special Educational Needs Nurseries, but some of these were specialist autistic nurseries and the rest were in special needs nurseries catering for all types of disabilities, including autism. Typically, the children would attend the nursery for a number of 2-3 hour sessions per week. The nursery would engage in a range of

teaching activities, mostly group-based (play activities and some social stories). However, there were also some one – on – one teaching sessions, and most children had a dedicated support worker for some part of their nursery session. Many of the placements used visual scripting techniques such as TEACCH.

c) Portage

Portage is a home based teaching programme for preschool children with special educational needs (see Cameron 1997). The children are taught new skills through the use of questions and tasks, prompts and rewards. Parents and carers are shown how to apply this system by a weekly/fortnightly visit from a Portage supervisor. The training sessions are brief, usually about 15 – 20 minutes per day, and are scheduled when the parent believes the child will be at their most receptive. Typically, the parent will teach the child in a 1:1 situation, and will target one or two skills a week for teaching. Monitoring and evaluation of progress occurs at the supervisors visits. The Portage programme has been extensively used with children with developmental delay and is typically not intensive. Most children in the current study received this form of intervention (12). However, some children (4) received a more intensive version of the Portage procedure that involved greater temporal input per day (around 2 hours in some cases).

d) Parents of Autistic Children Training and Support

This programme has been developed by Bexley Local Education Authority. This is a home-based programme for pre-school children between 2:6 and 4:0 years old. The programme has five distinct parts:

1. An introductory training course for parents and carers which is intensive and takes five days.
2. There are home-based supervision and support sessions from a supervising psychologist.
3. Up to four home-based sessions each week of direct 1:1 teaching for the child are carried out by trained assistants.
4. There is also regular progress monitoring using checklists, observations, and video recording.
5. Finally, the aim of the scheme is a planed and supported transfer into school, usually a nursery/reception class.

The sessions are typically discrete-trial, reinforcement-based, and focus on social cooperation, communication, self-help, basic skills, and play. The important facet of this scheme is it combines parental training and home-based intervention.

According to Reed (2006) the current report failed to note any evidence of recovery from autism produced by any intervention. In terms of intellectual functioning, ABA and Special Nursery interventions proved to produce gains of the same magnitude as many gains produced by previous longer-term "clinic based ABA programmes." In terms of educational improvements, all of the interventions generated a gain. However, ABA produced greater gains than the other interventions. In terms of adaptive gains, Nursery Placements produced gains, whereas, the other intervention did not. Reed et al suggested that both ABA and Nursery Placements appeared somewhat more effective than the Portage or PACTS programmes. The results from clinic based ABA trials were partially replicated on a community–based sample, specifically with respect to intellectual and

educational skills. Special Nursery placement was also found to be effective for improving adaptive behaviour and educational skills. There was no clear relationship between temporal input and gains, and a programme of around 15-20 hours per week appears to be optimal (Reed et al, 2006).

Dawson and Osterling (1997) identified six features that are common to most comprehensive early-intervention programs for autism. They suggested that these "tried-and-true" features, rather than the specific methods emphasized by each program, may be responsible for the observed effects of early-intervention programs. These common features include:

1. Curriculum content which put emphasis on selective attention, imitation, language, toy play, and social skills;
2. Highly supportive teaching environments with definite attention to generalization of the acquired skills in natural settings;
3. An emphasis on predictability and routine;
4. A functional approach to problem behaviours;
5. A focus on transition from the preschool classroom to kindergarten, first grade, or other appropriate placements;
6. Parental involvement in treatment.

Several of these features were included into the treatment recommendations for autism which was made by the American Academy of Child and Adolescent Psychiatry (AACAP, 1999). Further research is needed to help to identify the potential effects of each of these components.

2. 1.5 Diagnosis: Early Warning Signs of Autism

In order to have an effective intervention programme for children with autism, an early diagnosis is extremely important. While the cause of autism remains unclear, experts and professionals agree that diagnosing it early improves the outcome remarkably. However, most of the time it is diagnosed between the ages of 2 or 3, when the child starts showing the signs of autism.

a) The Checklist for Autism in Toddlers "The CHAT"

The CHAT is a diagnostic tool used to identify very young children at risk for developmental delay. The CHAT is a short, simple method that has demonstrated a high rate of success in screening children as young as 18 months for risk of developmental delay including autism spectrum disorders. The following is an informal version of the CHAT as three basic behaviours, which should be educed from the child by the paediatrician:

1. Elicit a pointing gesture from the child.

2. Elicit joint attention.

3. Elicit imaginative pretend play. (Baron-Cohen, S., Allen, J., and Gillberg, C., Can autism be detected at 18 months: the needle the haystack and the CHAT. Br. J. Psychiatry. 1992; 161:839-843)

If the child does not point or gesture, does not look where you are pointing, and does not engage in any imaginative pretend play, the child should be considered at high risk for developmental delay and should be referred for further screening.

To improve the CHAT's ability to detect most children on the autistic spectrum at 18 months, including those who go on to develop Asperger's Syndrome, it has been revised. The Q-CHAT (Quantitative Checklist for Autism in Toddlers) is a scale, where you can show behaviour to differing degrees (from very frequent to very infrequent), unlike the CHAT which was an all or none scoring system (either pass or fail each item).

The Q-CHAT will be tested on 20.000 toddlers aged 18 to 30 months, to see if it meets the standards for national screening instruments: correctly identifying at least 75% of the actual cases in population. Results of 5 years study lead by Professor Simon Baron- Cohen at the Autism Research Centre, Cambridge, will be available in late 2009 (Allisson, Baron-Cohen, 2008).

b) The Diagnostic and Statistical Manual of Mental Disorders fourth Edition "DSM-IV" and The Autism Diagnostic Interview "The ADI-R"

The DSM-IV (Appendix A) uses a collection of observed behavioural symptoms including impaired communication and social interaction, stereotypic behaviours, and restricted activities to form the diagnosis of autism and related disorders. The fifth edition ("DSM-V") is currently in consultation, planning and preparation, due for

publication in May 2012 (<u>DSM-V: The Future Manual</u>: http://www.psych.org/dsmv.asp).

The Autism Diagnostic Interview (ADI-R) is a diagnostic tool, which is largely used

for research purposes. This tool allows an extensive behavioural and clinical history

of a child to be developed and it is obtained through parental interview (Lord, et al.,

1994). ADI-R focuses on behaviour in three main areas: qualities of reciprocal social

interaction; communication and language; and restricted and repetitive, stereotyped

interests and behaviours. The ADI-R is appropriate for children and adults with

mental ages from about 18 months and above (Lord, et al. 2003). Extensive training

and knowledge about autism spectrum disorder and the ADI-R is required for both

conducting and scoring the interview (Le Couteur, 2007).

c) Childhood Autism Rating Scales (C.A.R.S)

Childhood Autism Rating Scales (C.A.R.S) is designed by Eric Schopler et al.,

(1988). CARS help to identify children with autism and determine symptoms severity

through quantitative rating based on direct observation. "CARS" assesses the children

in many areas such as in social, adaptive, emotional and communication functioning

etc… (For more information, see chapter 3 and chapter 5).

2.1.6 How Children Acquire Language:

The process of language acquisition is among the leading aspects that distinguishes

humans from other organisms.

One of the complexities of acquiring language for typically developing children is that it is learned by infants from what appears to be very little input. This has led to a long standing debate - on whether the child is born with some idea of meanings, or whether these are learned based on social convention.

Concerning language acquisition for children with autism is probable that the socio-pragmatic deficit is characterized by shared attention failure. Shared attention is an advanced stage of joint attention. Joint attention consists of following the gaze of someone else. In shared attention, the child additionally verifies the direction of the others' gaze. Baron –Cohen's studies (1995) show that autistic children are able to detect the eye direction, it is explicitly asked for. However, they don't seem to spontaneously produce this behaviour as typically developing children do.

2.1.6 .1 Development of speech, language and communication

Speech is a large part of a language that people use on a daily basis. However, language is more than speech alone. It encompasses elements of communication such as body language, gesture and eye-contact. As a child develops, so does their use of language to communicate. The speech and language development of a child would normally be as shown in table (2.1).

There are four main components of language (Berk, L. E, 2006).

Berk, L. E. (2006). Chapter 9 - Language Development. In Child Development (8th ed., pp. 356–395). Pearson. (Original work published 1989):

   a) **<u>Phonology</u>** involves the rules about the structure and sequence of speech sounds.

b) **Semantics** consists of vocabulary and how concepts are expressed through words.
c) **Grammar** involves two parts. The first, **syntax**, is the rules in which words are arranged into sentences. The second, **morphology**, is the use of grammatical markers (indicating tense, active or passive voice etc.).
d) **Pragmatics** involves the rules for appropriate and effective communication. Pragmatics involves three skills:
   o Using language for greeting, demanding etc.
   o Changing language for talking differently depending on who it is you are talking to
   o Following rules such as turn taking, staying on topic

Each component has its own appropriate developmental periods.

Age	Language development
Birth	Sounds
0-3 months	Differentiating cries - baby uses a different cry for different situations
4-6 months	Vocal play - gurgling, babbling
7-12 months	Speech like babbling including the use of consonants and vowels. First words - "mama", "doggie"
1-2 years	Use of two word questions - "No doggie?", "Where ball?"
2-3 years	Two/three word utterances. Use of attributes - "Big", "Furry"
3-4 years	Combination of four or more words in sentence form
4-5 years	Use of long and detailed sentences. Use of "adult-like" grammar

Table (2.1) Language Development
Obtained from NAS website (2009)
www.nas.org

a) <u>Phonological development</u>

- From shortly after birth to around one year, the baby starts to make speech sounds. At around two months, the baby will engage in cooing, which mostly consists of vowel sounds. At around four months, cooing turns into babbling which is "the repetitive consonant-vowel combinations". Babies understand more than they are able to say.

- From **1–2 years**, babies can recognize the correct pronunciation of familiar words. Babies will also use phonological strategies to simplify word pronunciation. Some strategies include repeating the first consonant-vowel in a multi-syllable word ('TV' >'didi') or deleting unstressed syllables in a multi-syllable word ('banana'>'nana'). By **3–5 years**, phonological awareness continues to improve as well as pronunciation.

- By **6–10 years**, children can master syllable stress patterns which helps distinguish slight differences between similar words.

b) <u>Semantic development</u>

- From birth to one year, comprehension (the language we understand) develops before production (the language we use). There is about a 5 month lag in between the two. Babies have an innate preference to listen to their mother's voice. Babies can recognize familiar words and use preverbal gestures.

- From **1–2 years**, vocabulary grows to several hundred words. There is a vocabulary spurt between 18–24 months, which includes fast mapping. Fast mapping is the babies' ability to learn a lot of new things quickly. The majority of

the babies' new vocabulary consists of object words (nouns) and action words (verbs).

- By **3–5 years**, children usually have difficulty using words correctly. Children experience many problems such as under-extensions, taking a general word and applying it specifically (for example, 'blankie') and over-extensions, taking a specific word and applying it too generally (example, 'car' for 'van'). However, children coin words to fill in for words not yet learned (for example, someone is a cooker rather than a chef because a child will not know what a chef is). Children can also understand metaphors.

- From **6–10 years**, children can understand meanings of words based on their definitions. They also are able to appreciate the multiple meanings of words and use words precisely through metaphors and puns. Fast mapping continues.

c) <u>Grammatical development</u>

From **1–2 years**, children start using telegraphic speech, which is two word combinations, for example 'wet diaper'. Brown (1973) observed that 75% of children's two-word utterances could be summarised in the existence of 11 <u>semantic</u> relations:

Eleven important early semantic relations and examples based on Brown 1973:

- Attributive: 'big house'
- Agent-Action: 'Daddy hit'
- Action-Object: 'hit ball'
- Agent-Object: 'Daddy ball'
- Nominative: 'that ball'

- Demonstrative: 'there ball'
- Recurrence: 'more ball'
- non-existence: 'all-gone ball'
- Possessive: 'Daddy chair'
- Entity + Locative: 'book table'
- Action + Locative: 'go store'

At around 3 years, children engage in simple sentences, which are 3 word sentences. Simple sentences follow adult rules and get refined gradually. Grammatical morphemes get added as these simple sentences start to emerge. By **3–5 years**, children continue to add grammatical morphemes and gradually produce complex grammatical structures. By 6–10 years, children refine the complex grammatical structures such as passive voice.

d) <u>Pragmatics development</u>

- From birth to one year, babies can engage in joint attention (sharing the attention of something with someone else). Babies also can engage in turn taking activities. By **1–2 years**, they can engage in conversational turn taking and topic maintenance. At **ages 3–5**, children can master illocutionary intent, knowing what you meant to say even though you might not have said it and turnabout, which is turning the conversation over to another person.

- By **age 6-10**, shading occurs, which is changing the conversation topic gradually. Children are able to communicate effectively in demanding settings, such as on the telephone.

There are a few different theories as to why and how children develop language. The most popular -- and yet heavily debated-- explanation is that language is acquired through imitation. The two most accepted theories in language development are psychological and functional. Psychological explanations focus on the mental processes involved in childhood language learning. Functional explanations look at the social processes involved in learning the first language.

Under Behaviorism, it was felt that this process may be achieved through a form of operant conditioning. In B.F. Skinner's Verbal Behaviour (1957), he suggested that the successful use of a sign such as a word or lexical unit, given a certain stimulus, reinforces its "momentary" or contextual probability (Skinner's 1957).

2.1.6 .2 The Core symptoms in Autism

The severity of core symptoms varies greatly between individuals, but all people with autism have some core symptoms in the areas of:

   a) **Social interactions and relationships.**

Unusual social development becomes apparent early in childhood. Autistic infants show less attention to social stimuli, they tend not to smile and look at others as often, and they respond less to their own name. Autistic

toddlers differ more strikingly from social norms. For example, they have less eye contact and participation in turn taking, and are more likely to communicate by manipulating another person's hand (Volkamar, 2005). Three- to five-year-old autistic children are less likely to exhibit social understanding, approach others spontaneously, imitate or respond to emotions, communicate nonverbally, or take turns with others. However, they do form attachments to their primary caregivers (Sigman, et al, 2004). They display moderately less attachment security than usual, although this feature disappears in children with higher mental development or less severe ASD (Rutgers, et al. 2004).

Symptoms of social impairments may include:

o Significant problems developing nonverbal communication skills, such as eye-to-eye gazing, facial expressions, and body posture.
o Failure to establish friendships with children the same age.
o Lack of interest in sharing enjoyment, interests, or achievements with other people.
o Lack of empathy. People with autism may have difficulty understanding another person's feelings, such as pain or sorrow.

b) <u>Verbal and non-verbal communication.</u>

Differences in communication may be present from the first year of life, and may include delayed onset of babbling, unusual gestures, diminished responsiveness, and vocal patterns that are not synchronized with the caregiver. About a third to a

half of individuals with autism do not develop enough natural speech to meet their daily communication needs *(*Noens, et al. 2006). In the second and third years, autistic children have less frequent and less diverse babbling, consonants, words, and word combinations; their gestures are less often integrated with words. Autistic children are less likely to make requests or share experiences, and are more likely to simply repeat others' words "echolalia" (Landa, 2007) or reverse pronouns (Kanner, 1943), Joint attention seems to be necessary for functional speech, and deficits in joint attention seem to distinguish infants with ASD (Johnson & Myers, 2007), for example, they may look at a pointing hand instead of the pointed-at object (Tager, et al. 2007) and they consistently fail to point at objects in order to comment on or share an experience (Johnson & Myers, 2007). Autistic children may have difficulty with imaginative play and with developing symbols into language. (Landa, 2007; Tager, et al. 2007).

Symptoms may include:

o   Delay in, or lack of, learning to talk.

o   Problems taking steps to start a conversation. Also, people with autism have difficulties continuing a conversation after it has begun.

o   Stereotyped and repetitive use of language. People with autism often repeat over and over a phrase they have heard previously (echolalia).

o   Difficulty understanding their listener's perspective. For example, a person with autism may not understand that someone is using humor. They may interpret the communication word for word and fail to catch the implied meaning.

c) <u>Limited interests in activities or play, repetitive behaviour.</u>

Symptoms may include:

- An unusual focus on pieces. Younger children with autism often focus on parts of toys, such as the wheels on a car, rather than playing with the entire toy.
- Preoccupation with certain topics. For example, older children and adults may be fascinated by video/computer games, dinosaurs, trains etc...
- A need for sameness and routines. For example, a child with autism may always need to put his hat on before his shoes and insist on driving the same route every day to school.
- Stereotyped behaviors. These may include body rocking and hand flapping.

d) <u>Behaviour</u>

Autistic individuals display many forms of repetitive or restricted behavior, which the Repetitive Behavior Scale-Revised (RBS-R) *(Lam & Aman 2007).* Categorizes as follows.

- <u>**Stereotypy**</u> is repetitive movement, such as hand flapping, making sounds, head rolling, or body rocking.
- <u>**Compulsive behavior**</u> is intended and appears to follow rules, such as arranging objects in stacks or lines.

- **Sameness** is resistance to change; for example, insisting that the furniture not be moved or refusing to be interrupted.

- **<u>Ritualistic behavior</u>** involves an unvarying pattern of daily activities, such as an unchanging menu or a dressing ritual. This is closely associated with sameness and an independent validation has suggested combining the two factors. (*Lam & Aman , 2007).*

- **Restricted behavior** is limited in focus, interest, or activity, such as preoccupation with a single television program, toy, or game.

- **<u>Self-injury</u>** includes movements that injure or can injure the person, such as eye poking, <u>skin picking</u>, hand biting, and head banging (Johnson & Myers, 2007). A 2007 study reported that self-injury at some point affected about 30% of children with ASD. (Dominick, et al. 2007).

No single repetitive behavior seems to be specific to autism, but only autism appears to have an elevated pattern of occurrence and severity of these behaviors. (Bodfish, et al. 2000).

2.1.7 The Parental Stress

As far as the educational approaches are concerned, there has been a huge debate in involving parents in educating their children with autism. Some argue that it will be an added stress to the parents and of the perceived added value to the intervention (Developmental Medicine and Child Neurology, 2005, 47: p.496). There is a lack of

methodologically adequate studies supporting parent-mediated interventions. However, the existing literature and clinical experience suggest that the use of parents as co-therapists provides an increased number of therapy hours a child receives in a constant and consistent way. It also provides the children the possibility of generalizing their skills (which is impairment in children with autism). There is disagreement in the research about the best way to teach a child on the autistic spectrum (Lotter, 1977; Howlin, 1997a; Jones et al., 1998). The core skills that need to be developed with autistic children are in the areas of social interaction, communication and imaginative play and behaviours. The literature review showed the information on autism and methodologies approach to be vast which makes it difficult for parents to decide on the best approach for their children. Parenting a child with autism is stressful, (Konstantareas, et al., 1992) adding to that sometimes, parents are uncertain about how to meet their children needs. There is an increasing public awareness of autism, which might lead children of being diagnosed at an early age. Autism affects children at different degrees. Local Education Authorities "LEAs" acknowledge the increase number of children diagnosed with autism (Fombonne, 1997). However, there is limited numbers of specialized school for autistic spectrum. And parents are frustrated at the impossible odds they are faced with when trying to secure placement at a specialist school (Tissot, 2003, p.254), 47% of parents described the process as having an effect on their family life and stated that they found the process of securing an educational placement for their children as stressful (Tissot, 2003, p. 255). The literature review highlighted the importance of parental involvement in the education of their children. Schools that work with parent and parent provide "dramatic and long lasting effects" (Deam, 2001 p.216). The research has shown that

parenting a child with autism is stressful and the process of securing an educational

provision to the child will increase the stress level of the parents (Mary, Baker, et al,

2005). An important question rises from the parental stress section: has the process of

finding an appropriate educational provision for children with autism may affect their

parents' stress level?

Few studies address how the ABA intervention model impacts families with children

with autism (Schwichten & Poehlmann, 2007). Schwichten states that the intense

requirements that ABA programmes place on children and families are often cited as a

critique of the programme although little evidence is available to support his claim.

Therefore, his study is to assess whether mothers of children participating in a home-

based ABA programme reported elevated depressive. The findings of this study

supported the hypothesis that families participating in ABA experienced elevated

depressive symptoms, much like any family raising a child with autism, suggesting a

potential area for family level intervention.

2.2 The Areas of Disagreement

In this section, the theoretical framework for language development will be raised; the

main focus will be on the areas which are debated between professionals, practitioners,

and parents. It is very important for this study to include the prevalence of autism, the

aetiology/prognosis of autism, and the intervention strategies, because of the impacts of

each one of them on the educational provisional for children with autism.

2.2.1 Theoretical Framework of Language Development:

There are four major theories of language development.

a) **<u>The Behaviorist Theory</u>** was proposed by B. F. Skinner (father of behaviorism) who said that language is learned through operant conditioning (reinforcement and imitation).

This perspective sides with the nurture side of the nature-nurture debate. This perspective is not widely accepted today because there are many criticisms. These criticisms include that the perspective is too specific, encourages incorrect phrases and is not entirely possible. In order for this to be possible, parents would have to engage in intensive tutoring in order for language to be taught properly (Skinner's, 1957).

The Behavioural learning theory is based on three core assumptions (Wolery et al. 1988):

- Behaviour is conceptualised within a three term contingency that includes antecedents, behaviour and consequences.
- Antecedent stimuli and prior experience of consequences will affect behavioural reactions.
- Effective teaching incorporates control of antecedents and consequences. Skinner's (1957) operant conditioning model focuses on the use of positive reinforcement as the key of behavioural change.

b) The **nativist theory** proposed by Noam Chomsky, (Chomsky, 1957), says that language is a unique human accomplishment. Chomsky says that all children have what is called a Language Acquisition Device LAD, an innate language acquisition device that allows children to produce consistent sentences once vocabulary is learned. "Human brain contains a (LAD) which automatically analyzes the components of speech a child hears." He also says that grammar is universal. This theory, while there is much evidence supporting it (language areas in the brain, sensitive period for language development, children's ability to invent new language systems) is not believed by all researchers (Santrock, 2008).

Chomsky: Language Acquisition Device

Chomsky's theory is that humans are born with a special biological brain mechanism, called a Language Acquisition Device "LAD" (Santrock, 2008). This theory supposes that the ability to learn language is inborn, that nature is more important than nurture and that experience using language is only necessary in order to activate the LAD (Chomsky's, 1957). Chomsky's background is in linguistics, and psycholinguists continue to contribute much to our understanding of languages and how children acquire them. His theory is described as Nativist. The main contribution of his work has been to show that children's language development is much more complex than the Behaviourists ('Show the way', Nursery World, 18 March 2004), who believed that children learn language merely by being rewarded for imitating. One problem with Chomsky's theory is that it does not take enough account of the influence that thought (cognition) and language has on each other's development

c) The **empiricist theory** argues that there is enough information in the linguistic input that children receive, and therefore there is no need to assume an innate language acquisition device. This approach is characterized by the construction of computational models that learn aspects of language and/or that simulate the type of linguistic output produced by children (Tomasello, 2008). The most influential models within this approach are statistical learning theories such as connectionist models and chunking theories such as CHREST.

d) **The Interactionist Perspective** theory consists of two components (Gallaway, & Richard, 1994). This perspective is a combination of both the nativist and behaviorist theories. The first part, the information-processing theories, tests through the connectionist model, using statistics. From these theories, we see that the brain is excellent at detecting patterns.

The second part of the interactionist perspective, is the social-interactionist theories. These theories suggest that there is a native desire to understand others as well as being understood by others.

There are two basic theories for language acquisition. Noam Chomsky's theory (Chomsky, 1957), which is believed people have a basic pattern of learning language inside of their brain since they were born. His theory proposed that humans are biologically prewired to learn language at a certain time and in a certain way. He argued that children are born with a Language Acquisition Device "LAD" (Santrock, 2008). On

the other hand, B. F. Skinner's theory which is believed "people" has to be taught how to speak by someone for language acquisition.

The behavioral view of language development is no longer considered a viable explanation of how children acquire language, yet a great deal of research describes ways in which the children's environmental experiences influence their language skills. (Tomasello 2003-2008) stresses that young children are intensely interested in their social world and that early in their development they can understand that intentions of other people. (Santrock, 2008).

Because language underline most learning in the typical child and is defective in children with autism, developing language skills is seen a major goal of any training program. Findings on early intervention suggest that the functional potential of children with autism can be increased following intensive programmes (Rogers, 1996). Development of communications abilities has been shown to decrease children's problem behaviour and increase their abilities to interact successfully with peers (Fox & Phillbrick, 1997).

It is crucial that children are allowed to socially interact with other people who can vocalise and respond to questions. For language acquisition to develop successfully children must be in an environment that allows them to communication socially in that language.

2.2.2 Prevalence

It is very important for this study to include the prevalence of autism because of the changing number of children diagnosed with autism and the major effects on the educational, medical and social provision for the children. Autism has not changed but the reported prevalence of autism has increased dramatically, 1 in 258 children in California is diagnosed with autism (California study, 2002). In 2003, according to the Centres of Disease Control "CDC" autism affects up to one in 500 people in the United States. (Schaffer Autism Report, July 16, 2003 Vol. 7 No. 148). However, "CDC's" Autism and Developmental Disabilities Monitoring (ADDM) Network released data in 2007 that found about 1 in 150 (8-year-old) children in multiple areas of the United States had an "ASD" Autism Spectrum Disorder. (Information retrieved from: http://www.cdc.gov/ncbddd/Autism/addm.htm).

According to a study of the prevalence of autism among children aged 3 to 10 years in a major US metropolitan Atlanta, GA, in 1996 the prevalence was 3.4 per 1000. (Marshalyn Yeargin-Allsopp, Catherine Rice et, al. JAMA; 2003; 289:49-55). A study was conducted in Staffordshire; the prevalence of Pervasive Developmental Disorders was 62.6 per 10.000 while prevalence was 16.8 per 10.000 for autism. (JAMA, 2001; 285:3093-3099).

The following is taken from the official State statistics produced by the Department of Education in the United States, for numbers of people aged 6-21 served by Individuals with Disabilities Discrimination Act (IDEA) who have autism. It compares the increase over the nine years between 1992-93 and 2002-03. Autism increases 870% in the United States between the years of 1992-1993 and 2002-2003 (see Appendix F) (Source: IIDEA data, US Department of Education, http://www.ideadata.org; Schaffer Autism Report, October 27, 2003, Vol. 7, No 217). This increase can trigger many questions which we do not have an answer to yet. Is this increase due to a better diagnosis? Or many other factors are involved? More research is needed to answer these questions.

In 1996 the accepted rate of occurrence was 10 to 15 per 10.000.The United Kingdom National Autistic Society NAS reported the figure of 91 in 10.000 (National Autistic Society, 1999).

A total of 567 children with autism in five districts in North East London were identified (born between 1979-98) according to this study, the prevalence of autism which was rising from 1979 to 1992 reaching a plateau from 1992 to 1996 at a rate of 2.6 per 1000 live births. They claim that the early increase was due to the reducing age at diagnosis and more awareness of the disorder, increased recognition and better recording systems. The study showed an increase in the parents' belief of the MMR vaccine as a trigger to autism. (Archives of Disease in Childhood 2003; 88:666-670, BMJ Publishing Group Royal College of Paediatrics and Child Health).

The prevalence estimates of autism can be used to help communities project to know how many children may have autism for planning and identification purposes. They can also be used to provide for more appropriate interventions for children with ASDs.

2.2.3 Aetiology

The causes of autism remain unknown. However, some studies have suggested a possible genetic contribution (Rodier, 2000). Others have emphasised the possible link between MMR vaccine (Wakefield, et al., 1989) and ear infection, toxic metal, environmental toxins, fungal and yeast overgrowth in the intestinal tract, allergies and diet (Shaw, 1998).

2.2.3.1 Genetic contribution

Many studies have suggested that the genetic risk for autism is related to several genes. Using a statistical method known as Ordered-Subset Analysis (OSA), researchers at the Duke University Centre for Human Genetics have linked one type of autistic behaviour to a specific gene (GABRB3) on chromosome 15. With this study the researchers showed that OSA is an effective means for mapping disease-susceptibility genes. (Schaffer Autism Report, Tuesday, October 7, 2003 Vol. 7 No. 203).

The precise nature of the brain abnormality still remains elusive, despite considerable research effort. For many years it was felt that there was unlikely to be a genetic basis for autism, because most families only have one child with the condition (Pauls 1987). Over

the past two decades, however, systematic family and twin studies have shown that genetic factors play a crucially important role in causing apparently idiopathic forms of the condition (Lamb et al, 2000).

However, if autism is mainly due to genetic factors, the incidence of autism would be constant. That is to say that the percentage of autism within a particular age group should be the same. If the incidence of autism in 4 years old is 1 in a 1000, the incidence of autism in 40 years old should be 1 in a 1000. A study of the prevalence of autism in Iceland has found the incidence of autism over the last 20 years had doubled. What make this study important is that there is only one single institution to confirm all cases of autism. In addition it shows that factors other than genetics may be causing autism (Magnusson, et al., 1996).

2.2.3.2 Vaccine

The MMR vaccine controversy refers to claims that autism is caused by the MMR vaccine against measles, mumps, and rubella. The scientific consensus is that no credible scientific evidence links the vaccine to autism, and that the vaccine's benefits greatly outweigh its risks (Centre for Disease Control, 2008)*; (*Demicheli , et al. 2005); (The Institute of Medicine of the National Academy of Sciences, 2004).

Claims of a connection between the vaccine and autism were initially raised in a 1998 paper in the respected British medical journal The Lancet (1998).

The National Autistic Society (NAS) is keenly aware of the understandable concerns of parents surrounding suggested links between autism and the MMR vaccine. The National Autistic Society NAS urges continued efforts on the part of the Chief Medical Officer, supported by further authoritative research, to put these matters beyond doubt and allay any remaining public concern (www.nas.org.uk).

The NAS states that: "While there is still no conclusive evidence, it is crucial that health professionals listen to parents' concerns and respect their views as the experts on their individual children. Some parents experience a lack of sympathy and understanding in the healthcare system on medical issues related to their child's autism. This urgently needs to be addressed to ensure equal access to services. (www.nas.org.uk).

2.2.3 Prognosis

There is no known cure for autism (Johnson & Myers, 2007). Children recover occasionally, so that they lose their diagnosis of Autistic Spectrum Disorders "ASD" *(*Helt, et al. 2008). This occurs sometimes after intensive treatment and sometimes not. It is not known how often recovery happens (Rogers & Vismara, Rogers SJ, Vismara LA (2008). Reported rates in unselected samples of children with ASD have ranged from 3% to 25 %.*(* Helt, et al. 2008). A few autistic children have acquired speech at age 5 or older *(*Pickett, et al. 2009*).* Most children with autism lack <u>social support</u>, meaningful relationships, future employment opportunities or <u>self-determination</u> (Burgess & Gutstein, 2007). Although core difficulties tend to persist, symptoms often become less severe with age (*Rapin* & Tuchman, 2008). Few high-quality studies address long-term <u>prognosis</u>. Some adults show modest improvement in communication skills, but a few

decline; no study has focused on autism after midlife (Seltzer, et al. 2004). Acquiring language before age six, having an IQ above 50, and having a marketable skill all predict better outcomes; independent living is unlikely with severe autism (Tidmarsh & Volkmar 2003). A 2004 British study of 68 adults who were diagnosed before 1980 as autistic children with IQ above 50 found that 12% achieved a high level of independence as adults, 10% had some friends and were generally in work but required some support, 19% had some independence but were generally living at home and needed considerable support and supervision in daily living, 46% needed specialist residential provision from facilities specializing in ASD with a high level of support and very limited autonomy, and 12% needed high-level hospital care (Howlin , et al. 2004). A 2008 Canadian study of 48 young adults diagnosed with ASD as preschoolers found outcomes ranging through poor (46%), fair (32%), good (17%), and very good (4%), 56% of these young adults had been employed at some point during their lives, mostly in volunteer, sheltered or part-time work *(*Eaves, 2008). Changes in diagnostic practice and increased availability of effective early intervention make it unclear whether these findings can be generalized to recently diagnosed children (Croen et al. 2007).

2.2.4 Educational Interventions

Basic propositions about the nature of autism have not changed but fortunately, intervention services have. Educational treatment remains for most autistic children the most effective approach available. There is virtually no disagreement about the value of early educational interventions for children with autism. However there is no consensus among professionals on a specific one. Education has been defined as the fostering of

acquiring of skills and knowledge to assist a child to develop independence and personal responsibility; it encompasses not only academic learning but also socialization, adaptive skills, communication, modification of interfering behaviours, and generalisation of abilities across settings/environments (National Research Council , 2001).

Studies on interventions have methodological problems that prevent conclusions about efficacy (Ospina, et al, 2008). Systematic reviews of psychological interventions for autism showed some positive evidence, suggesting that some form of treatment is preferable to no treatment, however, the clinical results of these studies has generally been poor and there is little evidence for the relative effectiveness of treatments options (Krebs, et al, 2009). Intensive, special education programmes and behaviour therapy early in life can help children with autism acquire self-care, social and work related skills (Myers & Johnson, 2007). It can often improve functioning and decrease symptom severity, and maladaptive behaviour (Rogers & Visamara, 2008). Available Approaches include ABA, Developmental Model: RDI, DIR & Floor time, Structured Teaching: TEACCH, speech and language therapy, occupational therapy, and social skills therapy have some effectiveness in children with autism (Myers & Johnson, 2007). However, intensive ABA treatment has demonstrated effectiveness in enhancing global functioning in preschool children (Eikeseth, 2009), and it is well established for improving intellectual performance of young children with autism (Rogers & Visamara, 2008).

A variety of specific methodologies are used in educational programmes for children with autism. Several educational intervention methods are available as discussed below. They

can take place at home, school or at a centre devoted to autism treatment, they can be done by parents, teachers, speech therapist and occupational therapists (Myers & Johnson, 2007; Smith & Arbesman, 2008). A 2007 study found that augmenting a centre-based programme with weekly home visits by a special educator teacher improved cognitive development and behaviour (Richards, et al, 2007). Detailed reviews of intervention strategies to enhance communication (Goldstein, 2002; Paul & Sutherland, 2005; National Research Council, 2001; Koegel, 2000; Marrans, et al, 2005), to teach social skills (Bregman, et al, 2005; Lorimer, et al, 2002; Weiss & Harris, 2001; Taylor, 2001) and to reduce interfering maladaptive behaviours (Campbell, 2003; Horner, et al, 2002) have been published in recent years. Descriptions of selected methodologies are provided below:

2.2.4.1   Psychotherapies

Various forms of psychotherapy have been applied to autism, although there is a lack of research on their effects. The American Academy of Child and Adolescent Psychiatry (AACAP) recently issued a statement of practice parameters for the assessment and treatment of autism and related developmental disorders. The AACAP work group concluded that "it now appears that the usefulness of psychotherapy in autism is very limited" (AACAP, 1999). Nevertheless, various forms of psychotherapy continue to be used with autism (such as in France and The Middle East). The Researcher will discuss three of the currently most popular psychotherapies: psychoanalytic psychotherapy, holding therapy, and options therapy.

a)Psychoanalysis

As discussed earlier in the history section, psychoanalytic theories have long been applied to the aetiology of autism despite considerable evidence that many of the basic principles of these theories are inaccurate; nonetheless, psychoanalytic conceptualization and treatment of autism continues (Beratis, 1994; Bromfield, 2000). Many early psychoanalysts believed that autism is psychogenic, and this can still be found in such approaches today (Hobson, 2005).

Sigmund Freud (1856-1939) is considered the father of psychoanalysis (Jones, 1981). In psychoanalysis autism and other brain disorders are not brain problems but "mothering problems". These illnesses do not require pharmacological or behavioural treatment. They require "talk" therapy. Similar positions are taken for anorexia nervosa and Tourette's syndrome, schizophrenia and depression (Hines, 1990, p. 136). What is the scientific evidence for the psychoanalytic view of these mental illnesses and their proper treatment? There is none.

The most fundamental concept of psychoanalysis is the notion of the unconscious mind as a reservoir for repressed memories of traumatic events which continuously influence conscious thought and behaviour. The scientific evidence for this notion of unconscious repression is lacking. (Dawes, 1994; Dineen, 1998). Autism is a brain disorder which

raises the question of why would anyone such as psychoanalysis still maintains that Neuro-chemical or other physical disorders are caused by repressed or sublimated traumatic childhood experiences?

Although modern theories of autism postulate the strong influence of biological factors in the aetiology of the disorder, psychoanalytic theories have overflowed. Kanner (1946) was the first to describe the parents of children with autism as interpersonally distant. For example, he concluded that the autistic children he observed were "kept neatly in refrigerators which did not defrost" (Kanner, 1973, p. 61). However, Kanner also stressed that the disorder had a considerable biological component that produced disturbances in the formation of normal emotional contact. It was Bruno Bettelheim who was perhaps the most influential theorist promoting psychoanalytic interpretations of autism. Bettelheim rose to prominence as director of the University of Chicago's Orthogenic School for disturbed children from 1944 to 1978. He rejected Kanner's conclusions positing a biological role in the aetiology in autism and he did only focus on the Kanner's hypothesis of faulty parenting and concentrated on re-establishing the parental bond to create a safe environment for the child from his own point of view (Bettelheim, 1943; Bettelheim 1967). In the process of his treatment he separated children from their families. He later claimed cures for autistic children through psycho-dynamics milieu therapy. (Cohen, updated edition, 2002).   Other psychoanalytic therapists such as Mahler (1968) and Tustin (1981) promoted similar theories positing problems in the mother-child relationship as causing autistic type of behaviours, typically withdrawal (see Rosner, 1996, for a review of psychoanalytic theories of autism).

After his suicide in 1990, stories began to emerge that destroyed Bettelheim's reputation (Darnton, 1990). Several individuals claimed abuse at the hands of the famous doctor when they were at the Orthogenic School. Furthermore, Bettelheim often lied about his background and training. For example, although he frequently claimed to have studied under Freud in Vienna, Bettelheim possessed no formal training in psychoanalysis whatsoever, and instead held a degree in philosophy. Also, Bettelheim claimed that 85% of his patients at the Orthogenic School were cured after treatment; however, most of the children were not autistic and the case reports he presented in his books were often fabrications (Pollak, 1997). Despite the continued acceptance of Bettelheim's theories in some circles, no controlled research has been produced to support the refrigerator mother theory of autism. For example, Allen, DeMeyer, Norton, Pontus, and Yang (1971) did not find differences between parents of autistic and mentally retarded children and matched comparison children on personality measures. Despite the complete absence of controlled evidence, even today some psychoanalytic theorists continue in the tradition of Bettelheim by highlighting the putative role of early mother-child attachment dysfunctions in causing autism (Rosner, 1996).

Some researchers such as Smith (1996) suggested that psychoanalytic treatments for autism can be quite harmful. The focus on parental (and especially maternal) rejection in the aetiology and treatment of autism can lead to a misplaced blame and a deep sense of guilt in parents. The highly unstructured nature of many psychoanalytic treatments,

including granting autistic individuals the freedom to pursue preferred activities in treatment and the lack of focus on contingencies between behaviours and their consequences, can lead to a worsening of problems (Smith, 1996).

b) Holding Therapy

Holding therapy has been promoted for numerous childhood problems, including autism (Welch, 1988). Helfin and Simpson (1998) argue that autism results from a lack of appropriate attachment of child to mother. John Bowlby is the father of attachment theory he describes it as a "lasting psychological connectedness between human beings" (Bowlby, 1969, p. 194). Bowlby shared the psychoanalytic view that early experiences in childhood have an important influence on development and behaviour later in life. The early attachment styles are established in childhood through the infant/caregiver relationship. Bowlby believed that there are four distinguishing   characteristics of attachment (Bowlby, 1988):

1. Proximity Maintenance: The desire to be near the people we are attached to.
2. Safe Haven: Returning to the attachment figure for comfort and safety in the face of a fear or threat.
3. Secure Base: The attachment figure acts as a base of security from which the child can explore the surrounding environment.
4. Separation Distress: Anxiety that occurs in the absence of the attachment figure.

According to Helfin and Simpson (1998) the deficit in mother-child bonding/attachment is presumed to cause the child to withdraw inward, thereby resulting in social and communicative deficits. In order to re-establish this bond the mother provides intense physical contact with the child while constantly speaking to them. The previously deficient bond can be re-established and the "normal child" (they did not specify what is normal for that child) can emerge. As is evident from this discussion, holding therapy is largely based on psychoanalytic theories of autism of Bruno Bettelheim (1967). There is no research which has examined the efficacy of Holding Therapy.

Children with autism have severe and pervasive impairments in the development of social interaction, which may affect the attachment relationship with their parents and may have an impact on parenting. A recent published study about Autism, attachment and parenting: a comparison of children with autism spectrum disorder, mental retardation, language disorder and non-clinical children in the Journal of Abnormal Child Psychology 89 families with young children (mean age 26.5 months) were involved in the study, who were diagnosed with Autism, mentally retarded or language delayed or part of non-clinical comparison group. Attachment security was observed with the Brief Attachment Screening Questionnaire, and several parental self-report questionnaires assessed the parenting style, parental efficacy, parental experience of daily hassles, social support, and psychological problems children with autism were rated less secure compared to the other clinical and normal comparison groups. According to the study, parents of children with

autism coped remarkably well with the challenges of raising a child with autism (Rutgers, Anna H. Marinus H. Ijzendoorn, et al., 2007).

Sixteen autistic, 16 normal and 16 Down syndrome children (aged 3-6 years) were observed with their mothers and a female stranger in a laboratory playroom. Proximity and sociable behaviours were recorded continuously during observations sessions. The autistic children showed behaviours indicating that they were clearly attached to their mothers. Like the typically developed and Down Syndrome children, the deficits identified in the autistic group were restricted to a set of behaviours which have to do with social interaction such as show, give and mutual play. Descriptions of the aloof, unattached autistic children were not confirmed. (Dissanayake, Crossley, 1996).

c)Option

Options therapy grew out of the book *Son Rise* (Kaufman, 1976), written by parents of an autistic child. The most publicized case of recovery is the recovery of Raun Kaufman. His father Barry by observing his son has created a path, a gentle way of accepting his distant child. The Kaufman's, by observing their child joined him in his self-stimulatory behaviours such rocking, spinning etc... They were trying to get into his world.   They had created a simple environment for their son and all his wakening hours were spent with the parent or a carer. Six to eight hours a day were spent in structured or semi – structured activities (one to one approach). A formal evaluation of Raun at twenty

months old, showed a child with autism with language and social development skills at the level of eight months old. The second evaluation, at twenty-four months, showed age appropriate developmental levels in all areas.

The approach of the Son Rise Programme is to get the parents to accept the child. The Son Rise Model was not developed or directed by professionals. This programme does not collect or report outcome data in a way which is acceptable by the professional's community. According to Barry Kaufman the Son-Rise approach has facilitated deep-seated and lasting change in hundreds of children and their families (Kaufman, 1994).

However, this method does not give us a specific outcome of the children approaching a normal or moderate functioning. There is no scientific data to support Kaufman's statement. But given the above statement one can get the meaning that the parents have accepted their child's condition, therefore, the burden of such diagnosis and the state of doubts and conflict about it, had lasting changes in them. Accepting a child's diagnosis may lead the parent to accept the child.

Questions have been raised as to whether the boy was actually autistic (Siegal, 1996). The researcher could locate no published studies investigating the use of options therapy for autism.

2.2.4.2 Structured Teaching TEACCH

TEACCH stands for Treatment and Education of Autistic and related Communication Handicapped Children, which has come to be called "structured teaching", it emphasizes structure by using organized physical environments, predictably sequenced activities, visual schedules and visually structured activities, and structure work/activity systems where each child can practice various tasks (Rogers & Johnson, 2007). This method is widely used in the United States, Britain and Europe (Schopler and Mesibov, 1995). It is a programme founded by Dr. Eric Schopler of the Department of Psychiatry, University of North Carolina School of Medicine USA (Schopler, 1989).

TEACCH is a Psycho-Educational/Behavioural approach and is a comprehensive model of intervention system from early childhood through to adulthood (Developmental Medicine &Child Neurology, 2005, 47:494). TEACCH primary educational goal is to increase the levels of skills the student has. In TEACCH the student is provided with an environment that accommodates the child's characteristics of autism in other words, it is designed to provide settings that help the child make use of the skills they already possess.

A class room in a TEACCH setting is designed to make use of visual organisers, as most children with autism have strong visual processing. The teachers set up workstations for each child in the classroom. The children work alone at their workstations, often separated from each other by dividers.

How effective is a TEACCH model? There are some criticisms of this study which was conducted on 657 participants. Firstly, 51% of them had the diagnosis of autism while the rest suffered from other unspecified communication handicaps. Secondly, the age of the participants range from 2 to 26 years old. Thirdly, the participants were divided into four groups; the researchers for TEACCH study did not supply any information on the number of participants of each group. In order to evaluate the services provided to the participants, a survey was sent to parents but only 348 (53%) were returned. The majority of the parents were very satisfied with the outcome. Lastly, the staff concluded that TEACCH approach was very effective on 108 students. However, the staff did not specify the procedures of selecting those students for the study. They did not specify the characteristics which divided the participants into successful or unsuccessful categories.

A number of further weaknesses in this study have been observed, such as lacking external independent measures. Main findings are interpretation of the quantitative responses. Half of the participants were not autistic and the procedures to select the students were not described. In addition, the ratings by parents and staffs could be considered as biased or over- estimated if they were compared by independent evaluators. Despite some weakness of the TEACCH studies parents were satisfied with the children's progress.

The data that is available on children on the TEACCH approach is focused on the IQ scores. The effectiveness of the approach in functional language was not reported. Lord and Schopler (1994) reported that the children had substantial increases in IQ. However,

most of these children had post- intervention IQ which was considered in the mental retardation range. (Lord, Schopler, 1994).

Despite the world wide influence of TEACCH, the evaluation evidence for its efficacy is surprisingly limited. There is some evidence (Mesibov, 1997; Mesibov & Schopler, 2005), for the rational of the TEACCH approach and of parental reports of their satisfaction with their children's performance. However, follow-up studies for its effect are weak, mostly without control groups, did not involve random assignment to different treatment conditions such as other interventions, and tend to be internal evaluations. TEACCH still awaits scientific validation (Jordan, et al., 1998; Howlin, 2000).

2.2.4.3 Developmental Models

Developmental Models are based on the use of developmental theory to organize hypotheses regarding the fundamental nature of autism and design approaches to address the deficits (Harris, et al, 2005)

Developmental therapies such as Denver Model, Developmentally-based Individual-difference Relationship-based intervention (DIR)/Floor Time, and Relationship Development Intervention (RDI) are also called social-pragmatic interventions, those models are intended to promote social communication and other social interactions. The therapist or parent aims to make highly motivating activities available to the child, be responsive to what the child does (e.g., imitating or commenting on actions that the child

performs) and encourage ongoing interaction around these activities (e.g., turn-taking, requests, gestures, or alternation of gaze between the activity and the adult).

The Denver Model for example, is based largely on remediating key deficits in imitation, emotion sharing, theory of mind and social perception by using play, interpersonal relationship, and activities to foster symbolic thought and teach the power of communication (Harris, et al, 2005).

Developmental therapies are widely considered to be plausible intervention approaches (National Research Council, 2006). However, only a few studies have tested these interventions. In a small study, Rogers and colleagues (2006) found that one developmental approach, the Denver Model, may be efficacious for teaching early language skills to nonverbal children with autism.

a) Developmentally-based Individual-difference Relationship-based intervention (DIR)/Floor Time

DIR/ Floor time is developed by child psychiatrist Stanley Greenspan, Floor Time is a treatment method and a philosophy for interacting with children with autism. It is based on the premise that the child can increase and build a larger circle of interaction with an adult who meets the child at his current developmental level and who builds on the child's particular strengths (Greenspan & Wieder, 1997). In Floor Time, the parent engages the child at a level the child currently enjoys, enters the child's activities, and follows the child's lead from a mutually shared enjoyment, the parent is instructed how to move the child toward more increasingly complex interactions. Floor Time is usually

provided by parents under the direction of psychologists. However, it may be an intervention strategy used by professionals in other disciplines such as speech therapy or special education. It is called Floor Time because the parent gets down on the floor with the child to engage him/her at his/her level.

DIR/ Floor time is widely considered to be a plausible intervention approach (i.e., one that could be effective), but it has not been evaluated in peer-reviewed studies with strong experimental designs (National Research Council, 2001).

An important area for future research is to evaluate DIR in studies with strong experimental designs. Professionals should present DIR as untested and encourage families who are considering this intervention to evaluate it carefully.

b) Relationship Development Intervention (RDI)

Relationship Development Intervention is a treatment program proposed for autistic spectrum disorders. It was developed and trademarked by the husband/wife team of Steven Gutstein, Ph.D. and Rachelle K. Sheely, Ph.D., clinical psychologists. The RDI is a parent-based treatment that focuses on the core problems of gaining friendships, feeling empathy, expressing love and being able to share experiences with others (Gutstein, et al, 2002). RDI programme focuses on teaching parents and others how to motivate and enable those with autism to experience dynamic social relationships through "social and emotional development activities.

Research Summary: Preliminary data that may support this intervention are cited on the developers' website and in one published but uncontrolled study (Gutstein, Burgess, & Montfort, 2007). However, the intervention has not been evaluated in peer-reviewed studies with strong experimental designs.

2.2.4.4 Applied Behaviour Analysis "ABA" Lovaas Model

Applied Behaviour Analysis is the applied research field of the science of behaviour analysis, and it underpins a wide range of techniques used to treat autism and many other behaviours and diagnosis (Dillenburger & Keenan, 2009). ABA provides structure for looking at human behaviours, what cause these type of behaviours and how to make them increase or decrease. ABA- based interventions focus on teaching tasks one – on– one using the behaviourist principles of stimulus, response and rewards (Howard, et al., 2005) i.e. it provides a basic structure to teaching new skills by breaking them down into small steps, teaching one step at a time and rewarding correct responses. ABA also focuses on reliable measurement and objective evaluation of observed behaviours (Myers & Johnson, 2007). Applied Behaviour Analysis uses methods based on scientific principles of behaviour to build socially useful repertoires and reduce problematic ones (Cooper Heron, & Heward 1989). In addition, it is based on behavioural principles and tactics, i.e. reinforcement, prompting, shaping, and fading and so on. As behaviourism is a science and not a teaching method it can serve as a foundation for many different behavioural models. There is wide variation in the professional practice of behaviour analysis and among the assessments and interventions used in school based ABA programs (Steege, et

al, 2007). Many interventions rely heavily on Discrete Trial Teaching DTT methods, which use stimulus-response reward technique to teach foundation skills such as attention, eye contact, compliance, and imitation. However, children with autism have problem using DTT taught skills in natural environments (Myers & Johnson, 2007).

Many experts believe that children with autism are less likely than other children to learn from the everyday experience/environment (Lovaas, 1987). The ABA approach attempts to fill this gap by providing teaching tools that focus on simplified instructional steps and consistent reinforcement. The ABA approach can help children with autism to lead more independent and socially active lives (Lovaas, 1987). Research suggests that this positive outcome is more common for children who received early intervention.(Jensen & Sinclair, 2002).

47% of autistic children who received intensive behaviour modification therapy "ABA" (Lovaas Model) at the UCLA programme for at least two years were able to complete normal first grade classes. According to a 15 years study by professor Ivar Lovaas Ph.D. (Autism Research Review International, 1987-1993.).

ABA theory of autism (Lovaas model) has four tenets (Lovaas & Smith, 1989):
- Behavioural principles can be successfully applied to children with autism
- Multiple unique behavioural difficulties are evident in children with autism
- When placed in special environments, children with autism , are able to emulate typical learning patterns.

- A mismatch is apparent between autistic children's nervous systems and their environment.

This view rejects the central deficit theory of autism, Cohen and Volkmar (1997) aptly address the complexity inherent in the autistic disorder: *"virtually every type of theory relating to child development, cognitive, social, behavioural, affective, and neurobiological, has been applied to understanding the enigmatic impairments and competencies of autistic individuals"* (Cohen & Volkmar, 1997, p.xv)

Lovaas states that his UCLA teaching programme is based on the theory that ***"construction of a special intense and comprehensive learning environment for very young autistic children will allow some of them to catch up with their normal peers by first grade"*** (Lovaas, 1987, p. 8). Forty children aged at the time of intake were very young and were less than 40 months if mute (non verbal) and less than 46 months if echolalic. In the UCLA programme the children were divided into two groups: the experimental group and the controlled group. In the experimental group, 19 children have received 40 hours of intensive one-to-one ABA therapy over two years. The result was that nine children went on to regular first grade classes. Tests indicate that those children seemed to have no intellectual or behaviour problems. Of 40 participants of the controlled group (one group 10 hours of ABA therapy per week and the other group participants were receiving schools programme.) only one participant was able to attend regular first grade classes. A follow up study confirmed that the experimental group had maintained their level of intellectual functioning in since their previous assessment However; only one participant

did not meet the criteria of normal functioning. (American Journal and Mental Retardation, 1993).

Replication studies of the Lovaas Models outcomes varied between 25 to 35% (Smith et al. 2000; Handleman and Harris, 2001; Cohen, et al., 2006). However, the author of the 2005 replicating study, Dr. Sallows stated that he found that 48% of all the participated children showed rapid learning and they achieved average post-treatment scores, and at age 7, were succeeding in regular education classrooms. According to Dr. Sallows these results were consistent with those reported by Lovaas and Colleagues (Sallows & Graupner, 2005). No wider research on the AVB model has been conducted. This has led the researcher to investigate this issue further. The reader is reminded that the researcher is an experienced ABA/AVB therapist and a mother of a child with autism.

Smith and others (2000) have published a report of children receiving services from the UCLA Young Autism Project between 1989 and 1992. The children in this study received an average of 25 hours of services. Only 2 of the 15 children met the criteria of the "best outcome" used in earlier studies, where they placed in general education classes without special education services and had an IQ greater than 85. The 13% so called "recovery" rate is a poorer outcomes to the initially reported rate of 47% which would raise the following questions. Is the reduction of therapy hours a significant factor for these poorer outcomes?

A 2008 evidence -based review of comprehensive treatment approaches found that ABA is well established for improving intellectual performance of young children with autism (Rogers & Visamara, 2008).

A 2009 review of educational interventions for children, whose mean age was six years or less at intake, found that the higher-quality studies all assessed ABA, that ABA is well established and not other educational treatment is considered probably efficacious, and that intensive ABA treatment, carried out by trained therapists, is demonstrated effective in enhancing global functioning in pre- school children (Eikeseth, 2009). A 2009 comprehensive synthesis of Early Intensive Behavioural Intervention (EIBI), a form of ABA treatment, found that EIBI produces strong effects, suggesting that it can be effective for some children with autism (Reichow & Wolery, 2009). A 2009 systematic review came to the same principal conclusion that EIBI is effective for some but not all children, with wide variability in response to treatment, it also suggested that any gains are likely to be greatest in the first year of intervention (Howlin, et al. 2009). A meta-analysis concluded that EIBI has a large effect on full-scale intelligence and a moderate effect on adaptive behaviour (Eldevik, et al, 2009). However, a 2009 systematic review and meta- analysis found that Applied Behaviour Intervention ABI another name for EIBI, did not significantly improve outcomes compared with standard care of preschool children with Autism in the areas of cognitive outcome, expressive and expressive language, and adaptive behaviour (Spreckley & Boyd, 2009).

The most highly regarded professionals consider autism as a lifelong disorder (Lord and Rutter, 1994, p. 578; Baron-Cohen, 1995, p. 60). However, there have been claims of "recovery" from autism. Would the recovery from autism means that possible neurobiological factors underlying autism have been eliminated? No one claims to eliminate the neurobiological factors, (Cohen, Updated Edition, 2002). Furthermore, the neurobiological differences still exist and the impairments in behaviour have been reduced to the degree that the individual does not meet the criteria of autism. Taking Temple Grandin as an example of a person with autism who has gained a PhD, work success and writing books. (Grandin, 1995).   She still considers herself as autistic and she has developed her own personal catalogue of strategies to deal with common situations in order to manage her life.

The results of a review by Diggle et al, (2008), about parent-mediated intervention for young children with autism are based on data from two studies: two significant results were found to favour parent training in one study; child language and maternal knowledge of autism. In the other intensive intervention (involving parents but primarily delivered by professionals) was associated with better children outcomes on direct measurement than were found for parent mediated early intervention. As there were only two studies, the numbers of participants included were small, and the two studies could not be compared directly to one another. Randomized controlled trials involving large samples need to be carried out, and involving both short and long term outcomes information. (Diggle et al, 2008).

Parent delivered interventions based on ABA for children with autism have been evaluated using primarily single subject design methodology or small case series (Johnson et al, 2007). While the results of these evaluation are encouraging, the next step according to Johnson et al., is to standardize the interventions to allow for replication across sites, in studies with large samples and measures of long term, clinically meaningful outcomes such as improvements in children's functioning and their relationships with parents. Accordingly, the Research Units on Paediatric Psychopharmacology and Psychosocial Interventions (RUPP Autism Network) assembled a detailed manual for a structured behavioural parent training (PT) program, developed treatment fidelity and training procedures and conducted a pilot feasibility study. The Parent Training program is part of a large scale multi-site study (Johnson et al, 2007).

The behavioural approach and Lovaas programme in particular, have been criticised for their claimed results. After the publishing of Lovaas' data in 1987 and the reported 47% of so called "recovery" rate, some professionals accused Lovaas of excluding children who were likely to have poor outcomes (see for example Gresham and MacMillan, 1998; Jordan, Jones et al., 1998).

2.2.4.5 Applied Verbal Behaviour "AVB" Model

There is considerable research investigating the ABA's effectiveness (Lovaas Model). There is however, lack of available data in teaching children with autism using the AVB model (For more information on AVB, see Chapter 1 & Chapter 4).

An ABA related approach for teaching language and communication is called Applied Verbal Behaviour or AVB short (Sundberg & Michael, 2001).

AVB has recently been popularized in UK and many families are switching from traditional Lovaas into the AVB programme (PEACH, ABA on line discussion groups).

Several studies using AVB techniques have demonstrated the benefit of total communication training (signs and spoken works paired) compared to vocal training alone in facilitating the vocal responding of children who possessed only limited speech by Barrera & Sulzer – Azaroff (1983); Sundberg and Partington (1998) (Mirenda, et al., 2000). An experiment study with a 7 year old girl with autism with a moderate level of disability by Carbone, et al (2002) attempted to replicate previous findings related to teaching tacts (labels) and extended the use of total communication training to the teaching of another function of language answering the "wh" questions or the Intraverbals. The results of this experiments were consistent with the findings of previous research showing the superiority of total communication training compared to vocal alone training in the acquisition of vocal tacts with echolalia children with autism. The findings suggests that echolalic children with autism who fail to benefit from vocal training may acquire vocal responses more easily and in greater number when manual sign language training is added to their teaching regimen. (Carbone et al., 2002).

Teaching procedures based on Skinner's analysis of Verbal Behaviour (AVB) have been developed to increase vocalizations in previously nonverbal children, but studies on the efficacy of these procedures have yielded inconclusive findings (Carr & Firth, 2005). Several small studies support the use of Verbal Behaviour procedures to teach mands i.e. requests made verbally, through sign language, or with picture symbols.(Sundberg & Michael, 2001). (Sautter & LeBlanc, 2006) ; (Jennett, et al, 2008); (Carroll & Klatt, 2008)..

The AVB approach is similar to the Lovaas approach regarding the intensity of implementing the programme; in addition they are both based on the principles of ABA. However, there are differences in application, between Lovaas and AVB, such as the type of prompting (no-no prompts versus errorless teaching); the ratio of table time to teaching done in the natural environment (NET). In Lovaas model students generally work through an extinction burst during the onset of instruction while in AVB approach students are eased into instruction, since the teachers pair themselves with reinforcements. As for the presentation of skills/items, in Lovaas model they use mass trialling technique on one target versus several targets within one programme at a time (e.g. asking the students to touch head for 10 consecutive trials) while in AVB approach the use of mixing a number of different skills/items all at once (e.g. asking the students to touch head then tap table, clapping hands and doing some verbal imitation etc…).

AVB is based on the behavioural theory (similar to Lovaas model), However, AVB model recognised the needs and the strengths apparent in children with autism, and uses

both reinforcement and stimulus control teaching techniques. The guiding principles of the approach are (Strain & Cordisco, 1994):

- Children with autism benefit when intervention is consistent across school, home and community,

- They make better gains when parent and teachers work together.

- All children benefit from integrated environment.

- From AVB perspective, a more complete language repertoire would be acquired form a combination of DTT and NET procedures (Sundberg & Partington, 1998).

Although children with autism have common characteristics of the disorder, they have different needs and abilities and learn in different ways (Maurice, 1996). Therefore, various approaches might be needed. There are different applications of ABA such as Lovaas approach based on Discrete Trial Training (DTT) and Applied Verbal Behaviour (AVB) which is based on Natural Environment Training (NET). (Partington, 1998)

a)The Core Elements of AVB:

AVB is the teaching based on Skinner's analysis of Verbal Behaviour it is the application of the science of Verbal Behaviour. The AVB approach emphasizes a unit of analysis consisting of the relations between behaviour, motivative and discriminative variables, and consequences (Sundberg & Michael, 2001). Skinner identifies seven types of Verbal operants:

1. **Echoic:** requesting exactly the same thing that another person said for example: teacher says "ball" child says "ball"

2. **Receptive:** following instructions or complying with the mands of others. A tendency to touch a picture of a cat when asked to touch the cat.

3. **Imitation:** copying someone's movements.

4. **Mands:** requesting, asking for something. A pure mand occurs as a result of the EO or desire to have the item rather than having to be asked "what do you want?" for example child asks "where's dad? Or can I have a banana?"

5. **Tacts:** labelling, naming an item or an action that is present. A pure tact does not relate to have an EO or desire for the item. For example: the child is presented with the photo of banana and asked "what's this called?" Child says "banana"

6. **Intraverbals:** a response to something a person says which relates to an item or an action which is not present (answering questions or carrying on a conversation) For example: teacher asks the child "what says moo?" Child says "cow";

7. **RFFC:** these letters refers to Receptive Feature, Function and Class. Receptive "R": is teaching the child to receptively identify an item. Once a child is able to ask for or identify and label items in the environment, Feature, Function and Class "FFC" are taught so the child can learn association of "Intraverbals connection" between the words. Features are parts and description of items; Functions are the action of the item and

Classes are the groups the item can belong to for example the FFC of a banana are: Feature = yellow, long; Function = eat it, peel it and class = food or something we can eat. (Sundberg and Partington 1998).

8. **Textual:** Reading written words,

9. **Writing:** Writing and spelling words when spoken to you.

The AVB approach focuses on the development of each verbal operant (rather than on words and their meanings) and on the independent training of speaker and listener repertoires (Sundberg & Michael, 2001). Five more contributions that relate to the importance of development are: an effective language assessment (The ABLLS); Mand training; Establishing Operations; an Intraverbals repertoires, and Automatic Reinforcement (for more details, see chapter four).

On the other hand, Lovaas application of behaviour analysis is taught in a very structured environment (Leaf, &McEachin 1999). It puts a lot of emphasis on intensity, table time, eye contact, sitting still, receptive labels, verbal imitation, etc. (Lovaas 1981).

Figure (2.1) is a comparison of AVB model and Lovaas model. The reader is reminded that both models are derived from the science of Behaviour Analysis. However, Lovaas model heavily use Discrete Trial teaching "DTT" while the Applied Verbal Behaviour AVB uses Natural Environmental Training "NET" alongside "DTT" and the teaching is shaped by the student's learning and not only by preset teaching format.(see chapter 4).

Comparison of AVB and Lovaas

AVB Model	Lovaas Model
Teaching is done in both format NET and DTT settings (table format).	Teaching is done in DTT settings and later generalized to other natural settings.
Teaching is initially done in NET with table time gradually introduced.	Teaching is done in DTT setting or at a table, with limited time for NET settings.
Manding is a major focus of instruction and capturing the child's motivation (Motivating Operation/Establishing Operation MOs/EOs), both in formal and natural settings; language is first taught through mands and echoics.	Manding is considered an advanced language programme. Language is first taught through verbal imitation programme.
Students are eased into instructions. Since teachers pair themselves with reinforcement, and gradually placing demands on them.	Students are sometimes worked through an extinction burst during the onset of instruction, when they are exhibiting escape behaviour prior to placing demands on them.
Instructional planning includes opportunities for children to choose, decide, lead and initiate.	Focusing on reactive behaviour, teaching children to respond to adult directives and questions.
Teachers use errorless teaching procedures in order to increase the rate of correct responding, increase the rate of reinforcement, decrease value of escape and tasks avoidance. Quick prompting, fading and transfer procedures lower rates of student errors. Teaching the child to respond quickly and correctly requiring fluency and not just correctly.	Teachers sometimes use a no-no prompt procedure in which the student is given opportunities to respond and potentially to make multiple errors before prompts are delivered. This procedure result in increased student errors and escape behaviours.
The teachers are mixing and varying tasks which reduces problem behaviour and enhances generalization and increase rate of acquisition of skills for the students. This form of teaching is shaped by the student motivation, and the teachers' skills and creativity.	The sequence of instruction progresses from mast trialling of one target to introduction of one or more distracters, to random rotation. Skills are generally taught separately and later introduced with other items.
The function of inappropriate behaviours is determined through functional assessment. Special attention is paid to the MO/EO (motivation) of the child and how that can be manipulated in order to decrease the value of inappropriate behaviour and to teach the child a replacement appropriate behaviour	The function of inappropriate behaviours is also determined through functional assessment, however, Attention is not given to the MO/EO (motivation) of the students and how that can be manipulated in order to decrease the value of inappropriate behaviour and to teach them a replacement appropriate behaviour.
Skinner's functional analysis of language guides language instruction: echoic/motor imitation/copying a text; mand; tact; Intraverbals and textual/transcriptive/spelling.	Language instruction is not usually guided by Skinner's analysis of verbal behaviour

Figure (2.1) Comparison of AVB Model and Lovaas Model

In summary, the researcher highlighted the differences in applications between Lovaas model and the AVB model. There are considerable research and replication studies that support the effectiveness of ABA with varied out comes from 15% to 50% of success rate using the Lovaas model (Handelman and Harris, 2001). However, there are no similar studies on the AVB model. This research aims to examine the effects of implementing an AVB model in teaching children with autism and related disorders.

b)Brain's Plasticity and the Rehabilitation of Autism: the Use of Applied Behaviour Analysis "ABA" Approach

One could question whether the children's outcome (those who reached normal functioning with no signs of autistic symptoms) could be attributed to anything but their treatment. Could they have reached normal functioning spontaneously?

Some follow up studies by Lord and Schopler (1989) and Freeman et al. (1991) followed some autistic children who were undergoing unspecified treatment over period of time ranging from 4 and 12 years. They had some improvement in cognitive functioning. However, their impairments remained.

Some children with autism deteriorate at the age of 18 months after normal functioning, they regress into autism. It is puzzling as why some children recover or why they reach normal functioning after receiving intensive ABA therapy. Reviews of children with autism (Kurita, 1985- 1988; Volkmar, 1992) were non conclusive in trying to explain this deterioration.

Rakic (1991a) claims that the brain is in a state of maturational flux before and after birth. Prenatal neurogenesis and postnatal elimination of excess neurons, axons, and synapses can be influenced by genetic or extrinsic factors, which could result in autistic deterioration. The brain's plasticity could underline this maturation of the brain and the rehabilitation for autism. Rakic, (1991b, p.156) states that "cell death and axon degeneration provides a basis for cortical developmental plasticity during at least the early portion of infancy". Kandel and Jessel (1991) suggested that experience shapes the brain's neural circuitry at critical stages of development. One can hypothesize that in those autistic children whose condition is yet modifiable, intensive behavioural therapy modifies the neural circuitry before the condition becomes permanent (Cohen, 1994).

2.2.4.6 Occupational Therapy and Sensory Integration Therapy

This is one of the major treatment approaches used by occupational therapists that treat children and adults with motor and sensory problems. It is said "to be effective for improving the sensory processing capabilities of the brain." It involves activities such as swinging, rocking, and massage and so on. An intervention in which the participant receives sensory stimulation with the goal of improving attention and cognitive functioning, while decreasing disruptive or repetitive behaviours (Miller, 2006) Examples include brushing the body, compressing the elbows and knees, swinging from a hammock suspended from a ceiling, and spinning around and around on a scooter board. Examples of sensory diet interventions include wearing a weighted vest or wristbands, putting a

body sock on the participant, or massaging the child's mouth or other body parts. Sensory Integrative Therapy is often supervised by an occupational therapist.

It is widely used in the autistic population for those who have sensory problems. Gina Green (1996) is quite sceptical about the effectiveness of this approach and found weakness in the design of studies that reported positive results. Gina Green reports that "well controlled studies found that sensory integration therapy was ineffective or no more effective than other treatments" (Green, 1996).

Sensory Integration Therapy seemed to help some autistic individuals such as Temple Grandin, who is an adult with a Ph.D. and who suffers from autism. In her first book, Emergence: Labelled Autistic. She has developed a machine to calm and quiet herself. Her Squeeze machine, applies a firm pressure to the sides of a person's body. This machine has given Grandin the sense of relaxation and calm (Grandin, 1995).

The effectiveness of sensory integration therapy is controversial and there are few well-designed studies upon which to base a clear assessment of its effectiveness (Schaaf & Miller, 2005); (Dempsey & Foreman, 2001); (Dawson & Watling, 2000). Some researchers suggest that sensory integration therapy would be more useful for younger children than for older children (Baranek, 2002)
Successful sensory integration therapy has been able to decreased sensitivities to touch and to other stimuli (Schaaf & Miller, 2005); (Ayers & Tickle, 1980). The result is that the children are better to play, learn and interact with people and surroundings (Schaaf & Miller, 2005); (Ayers & Tickle, 1980).

Children with autism, who cry or arch their backs every time someone attempts to hold them, could be a defensive response to sensitivity to certain stimuli. The Sensory Integration Theory would indicate some dysfunction of the proprioceptive system (receives sensory information from our body), vestibular system (responsive to gravity and to head movements) and tactile systems. According to The Sensory Integration theory if these systems are integrated the outcome will be less attention, body awareness, and fewer motor skills which might be relevant to some of the autistic symptoms that some children with autism exhibit. Despite its plausibility, there is little controlled research on its effectiveness, therefore, no solid conclusion can be drawn (Dawson et al., 2000; Baranek, 2002, Rogers & Ozonoff, 2005)

2.2.4.7 Communication Interventions

Many children with autism do not speak, or have little speech, or have difficulties in effective use of language. Interventions that attempt to improve communication are commonly conducted by speech and language therapists, and work on joint attention, communicative intent, and alternative or augmentative communication (AAC) (Scottish Intercollegiate Guidelines Network, 2007). Little research supports the efficacy of speech therapy for autism (Weber, 2007). (AAC) methods do not appear to hinder speech and may result in modest gains (Schlosser, 2008). The common communication interventions that used in autism are as follows:

a) Speech and Language Therapy

The goal of speech therapy is to improve all aspects of communication. This includes:

comprehension, expression, sound production and social use of language (Goldstein,

2002). Speech therapy may include sign language and the use of picture symbols (Diehl,

2003).

A variety of approaches have been reported to be effective in producing gains in

communications skills in children with autism (National Research Council, 2001);

(Goldstein, 2002); (Paul & Sutherland, 2005).

A specific speech therapy program is tailored to the specific weaknesses and the

environment of the individual child with autism (Goldstein, 2002); (Ogletree, et al. 2007).

Unfortunately, it can be difficult to create a child-specific, evolving, long-term speech

therapy plan (Lord, 2000). Traditional, low intensity pull out service delivery speech

therapy models often are ineffective, and speech and language therapists are likely to be

more effective when they train and work in close collaboration with teachers, care givers

and the child's peers to promote functional communication in natural settings throughout

the day (American Speech –Language-Hearing Association, 2007).

b) Augmentative and Alternative Communication (AAC)

AAC refers to methods of communication to either enhance or replace conventional

forms of communication (spoken language). Individuals with significant impairment in

communication skills may rely on augmentative communication systems to express their

needs, wants, and feelings. There are a variety of augmentative communication systems that are available including gestures, sign language, picture exchange (such as PECS), pointing to pictures, and electronic devices that include voice output. Each system has unique advantages and disadvantages so the ultimate choose of a system should be predicated on a complete evaluation. Such an evaluation should consider the individual's existing skills, his/her communication needs, and the skills needed to interact with others.

c) Picture Exchange Communication System "PECS"

PECS stands for Picture Exchange Communication System, a language training system that the Delaware programme developed, field tested, and implemented. This programme is for children who have very good visual skills and difficulty in speech. Lack of an effective communication system increases the frustration of a child with autism, his aggression, tantrums and even self injury. Sign language has limited use with some autistic children. Therefore a PECS programme seemed to work better than sign language in communicating their needs. PECS encourages the child to initiate communication based on Applied Behaviour Analysis (ABA) principles, which will be covered later on in this chapter. The child is taught to request a desired item or activity by giving the adult a card (a picture of the desired item or activity) than the requested. Item should be given immediately to the child. Dr. Andrew Bondy is one of the authors of PECS. He states that of the 20 pre-schoolers started on PECS during the 1987-92 periods and who stayed in the Delaware Autism Programme for more than two years, 14 pre- schools children (70%) used speech alone for communication, while another three (15%) use a

combination of speech and PECS and only three children failed to acquire functional

speech. Many children begin to use PECS on the first day it was introduced. (Bondy,

1994). Similar studies were found for two smaller but well deigned studies (Charlop et

al, 2002); (Ganz & Simpson 2004). A larger study of school aged children found

significantly increased use of PECS when adults trained in the use of PECS were in the

classroom. The study involved 6 half days of PECS intervention per month for 5 months.

While use of PECS by the children increased, there was no significant increase in verbal

use (Howlin, et al. 2007). The children's use of PECS diminished after classroom visits

by the trained adults were stopped (Howlin, et al. 2007).

A comparison was made between PECS and another Augmentative and alternative

communication (AAC) technique, Responsive Education and Prelinguistic Milieu

Training (RPMT). The results showed that children with autism trained in PECS were

more verbal than those for whom the RPMT was used (Yoder & Stone, 2006).

Studies indicate that AAC may improve communication skills for children with autism

spectrum disorders who have limited or no verbal communication skills when ABA

teaching methods are used to teach AAC. However, benefits appear to be limited.

"Children with good verbal imitation skills demonstrate better speech production than

those with poor verbal imitation skills, with or without AAC" (National Research

Council, 2001, p. 58). Regarding sign language, "It is important to note that simple signs

may be a support for children learning to speak or an additional mode of communication

for children who have no speech or limited speech. However, it is very rare to find a child

with autism spectrum disorder who learns to sign fluently (in sentences) and flexibly.

Signing is not generally an entry point into a complex, flexible system" (National Research Council, 2001, p. 58). Similar findings have been reported for the Picture Exchange Communication System (see the research summary for PECS). There are case reports of children with autism spectrum disorders becoming proficient with electronic voice-output devices, but studies with strong scientific design have not been conducted on the use of such devices for children with autism spectrum disorders.

d) Makaton Sign Language

Makaton is a form of Augmentative and Alternative Communication (AAC) used with children and adults who are unable to speak or whose speech is difficult to understand (www.makaton.org).

Using Makaton principles with a child who has autism may aid their receptive communication. Makaton provides a visual cue, which the child may learn to associate to instructions. This is particularly important for children with autism as their visual-memory skills are often stronger than language ability (Beukelman & Mirenda, 1998).

Makaton is a system of communication that uses vocabulary of key word (manual signs and gestures) to support speech, as well as graphic symbols to support the written word.

Makaton sign language was developed in the early 1970s in the UK, Makaton is run by the Makaton charity. Communication using Makaton involves speaking (when possible) while concurrently signing key words. The sign vocabulary is taken from the local deaf sign language (with some additional natural gestures). One of the key differences

between Makaton and deaf sign language is that there is no use of facial expressions. As many people with cognitive disabilities find faces confusing because they change expression so rapidly.

When using Makaton, normal grammatical <u>speech</u> is spoken with key words signed in word order. This aids the child's ability to communicate by supplementing spoken language via a visual means. This process allows the child to understand information and encourages the development of spoken language (Milton, 2005).

There is only limited evidence to show that communication with children with autism is significantly enhanced by acquisition of sign. Studies indicate that the communication problems of generalization and maintenance are similar to those in verbal training programs. Signing of children with autism is similar to their use of language . It is stereotyped and used mainly to achieve immediate needs, and is rarely used to share experiences or feelings (Howlin 1998).

e) Social Stories

Social Stories attempt to improve the social skills of children with autism by using individualized short stories to help them interpret challenging or confusing social situations (Sansosti, et al. 2004). The stories have a specifically defined style and format (Gray & Garand, 1993). They describe a situation in terms of relevant social cues, the perspective of others, and often suggest an appropriate response (Reynhout & Carter, 2007); (Goldberg, 1995). The idea is that the child rehearses the story ahead of time with

an adult. When the situation actually happens the child can then use the story to help guide his/her behaviour (Gray & Garand, 1993).

Social stories are a relatively straightforward intervention. However, there is substantial variation in their use, and research into their effectiveness has been limited (Sansosti, et al. 2004).

Reviews of the use of social stories have found that the reported effects were highly inconsistent (Sansosti, et al. 2004); (Nichols, et al. 2005); (Reynhout & Carter, 2006) (Ali, Frederickson, 2006). One review article found that social stories were shown to be significantly effective on average, but not in every day case (Reynhout & Carter, 2006). Another article found that the limited studies available showed generally positive results, and concluded that the approach is promising (Ali, Frederickson, 2006).

f) Facilitated Communication

Facilitated Communication may be considered as a form of augmentative and alternative communication designed to accommodate the needs of a person with autism. Some published research that seems to support the claim that FC is an effective way to improve communication and cognitive skills of people with autism and other disabilities. This research consists of few qualitative studies describing astonishing communications produced by autistic persons with physical assistance by the facilitators. The authors of these studies reported a dramatic improvement of the communication and cognitive abilities of persons with disabilities (Biklen, 1992), (Biklen, 1993). The research did not

give any information about the participants. It did not measure the effects of such

approach; it did not employ enough controls for an observer or researcher bias.

Investigators around the world implemented simple controls for the possibilities that the

facilitators were doing the spelling. By preventing the children from knowing the

expected questions, less accurate responses by the child were produced. Those studies

found that the facilitators were the source of the message being produced and not the

person with disabilities, as the communication produced had few accurate responses

compared to responses where the facilitators had the access to the questions. (Jacobson,

Mullick, & Schwartz, 1995; Wheeler, Jacobson, Paglieri, and Schwartz (1993).

"Facilitated communication is a means by which many people with major speech

difficulties point at letters on an alphabet board or typing device to convey their thoughts.

It involves a facilitator who provides physical support to help stabilize the arm, to isolate

the index finger if necessary, to pull back the arm after each selection, to remind the

individual to maintain focus, and to offer emotional support and encouragement; the

facilitator progressively phases out the physical support." (Biklen, 1992, p 243).

2.2.4.8 Music Therapy: Auditory Integration Training "AIT" and The Listening Programme "TLP"

Children with autism may have difficulties processing many forms of sensory

information, where auditory processing issues play a major part in their difficulties such

as extreme hypersensitivity to sound, pitch discrimination issues, and sequential

processing difficulties that affect receptive and expressive language, cognition and social

skills. Because of these difficulties in the auditory processing children may tune out and act as deaf though their hearing tests are in the normal range.

Auditory Integration Training (AIT) involves listening to filtered, modulated music that presents sounds of varying volumes and pitches. AIT was initially developed by French physician Guy Berard as a treatment for auditory disorders. In the late 1970s, Berard began promoting the use of AIT for autism. The technique gained larger recognition with the publication of the book *The Sound of a Miracle* (Stehli, 1991; Stehli, 1995), written by the mother of a child who was allegedly "cured" of autism through the use of AIT.

Several small studies of AIT have obtained mixed results, with some studies showing benefits and others failing to do so (Sinha, Silove, Wheeler, & Williams, 2005).

Four well-controlled studies (Bettison, 1996; Gillberg et al., 1997; Mudford et al., 2000; Zollweg et al., 1997) failed to find any specific benefit for AIT. In the most recent study, Mudford et al. (2000) compared AIT with a control condition in which children listened to ambient room music through non-functional headphones. No benefit of AIT over the control condition was found on measures of IQ, comprehension, or social adaptive behaviour. Teacher-rated measures showed no differences between the groups and parent-rated measures of hyperactivity and direct observational measures of ear-occlusion actually non-significantly favoured the control group. The authors concluded that "no individual child was identified as benefiting clinically or educationally from the treatment" (p. 118).

The Listening Program "TLP" is music based sound stimulation programme and it is similar to AIT with extra advantage of using it at home and at clinics under the supervision of an authorized provider of TLP. TLP consists of eight one-hour audio CD's that contain specially processed classical music and nature sounds plus 112 a page guidebook. It is easily used

Listening sessions are 15 minutes in length, done once or twice per day, 5 days a week, using high quality stereo headphones. The average length of the programme is 8 to 16 weeks. The programme can be repeated several times per year. (Alexander Doman, 2003, Advanced Brain Technologies, LLC, 'www.advancedbrain.com).

The most commonly reported benefit of the use of TLP with children with autism are in the areas of increased engagement, better eye contact, paying more attention, reduction in aggressive behaviours, seeking and showing more affection, and better auditory processing, improved receptive language and reduced sound sensitivity (Doman, Lawrence, 2003). In addition, reported benefits of the use of "TLP" were provided by parents, and therapists. However, no controlled studies have been conducted yet.

2.2.4.9 The National Autistic Society "NAS" Early Bird programme

Early Bird is a three-month parent programme. It combines group training sessions for parents with individual home visits, when video feedback is used to help parents apply what they learn when they are working with their child.

A research study, carried out after the NAS set up the Early Bird programme, confirmed parents' feelings of being helped by participating in it.

Parents have a weekly commitment to a three-hour training session or a home visit and to ongoing work with their child at home during the three-month long programme. This short-term, focused model of early intervention supports parents in the period between diagnosis and their child starting school.

Early Bird aims to help parents understand why the development and behaviour of their pre-school child with autism may be different, so that parents can go on working out how best to help their child. Early Bird is offered by licensed teams across the UK. (www.autism.org/earlybird).

2.2.4.10 Highashi

Boston Higashi School, Inc. is an international programme serving individuals, aged three to 22, with autism. The philosophy is based upon the acclaimed tenets of Daily Life Therapy developed by the late Dr Kiyo Kitahara of Tokyo, Japan. The holistic approach captures the essence of humanity and reflects the sensibilities and sensitivities, the intellect and the aesthetics of humankind, attaining harmony in all aspects of life.

Dr Kiyo Kitahara's method provides children with systematic education through group dynamics, modeling, and physical activity. The goal of this educational approach is for the children to develop as closely to normal physically, emotionally, intellectually and to achieve social independence and dignity. (Collins, M. et al., 1995).

In practice, daily life therapy is an intensive form of specialised education delivered to children attending a single special school in Japan, the UK or the USA.

The overall view is that elements of the approach, such as the emphasis on physical activity, do appear to be beneficial to children with autistic spectrum disorders. The structures and organisation are known to reduce anxiety in children with autistic spectrum disorders – but this aspect also applies to TEACCH and any other approaches in which structure is the foundation.

There is a major question of whether those who graduate through the schools are able to maintain and sustain any progress made away from the school environment and programme. Can they transfer any skills they have learnt into new environments, such as their daily lives?

There is one scientific study of Daily Life therapy published in a peer-reviewed journal. It took the form of an observational study of six children, aged between primary and junior high school. The study (Larkin and Gurry, 1998) concluded that several important areas of Daily Life Therapy are worthy of greater attention, including strong gains in behaviour and attending to classroom stimuli. The children in the classrooms are quiet, well behaved, sit at their desks and manage well in a group of 6 to 10 children with one adult teacher. To observe this in a school for children with autism and PDD is remarkable. However, it also reported a disturbing lack of progress in other areas, including a lack of progress in appropriate responses. The target students appeared not to learn to follow specific directions or to comprehend what the teacher was asking them to do (Larkin and Gurry, 1998).

Summary of the chapter:

This chapter has taken a brief look at the history of autism, the characteristics and the classification of autism, the importance of the early intervention. It uncovers issues of the available interventions for autism. It also examines the prevalence rate and the possible causes of autism. The numerous issues which are associated with autism regarding prevalence, aetiology of autism treatment and interventions are complex to explore further in this study. Therefore, the researcher will limit the investigation to study the effects of implementing an AVB programme on children with autism at "The Autistic Centre" (see chapter 1: researcher's aims of the study).

This search on the literature has highlighted some relevant issues and gaps to this thesis:

- The areas of consensus among professionals are limited. These areas include the history of autism; triad of impairments; classification of autism; and the importance of early intervention.

- A review of the literature highlighted the importance of early educational programme for children with autism.

- Opposing views on the interventions, prevalence, and the aetiology of autism. These areas of disagreement are still in debate among professionals, researchers, and practitioners.

- Parenting a child with autism is stressful in addition to securing an educational provision for him/her. More research is needed in this area to find out if securing an educational provision for children with autism might affect their parents' stress level?

- The fluctuation in numbers of the children diagnosed with autism may affect the educational, medical and social services provided for them. The rate of diagnosis of autism increased dramatically over the past few decades. Although this increase could be related to a better diagnosis, many experts agree that these changes in diagnosis are not enough to explain the epidemic rate that autism has reached.

- Fluctuation in numbers of the children diagnosed with autism can put a strain on the educational, medical and social provision, in order to meet the high and unexpected demands for their services.

- Fluctuation in numbers can also, affect the quality of services provided to meet the children's needs. Regarding diagnosis, assessment, social, medical and educational intervention.

- High demands for limited provision. For instance, an autistic child might be placed in a special school for children with different disabilities because there is no vacancy in an autistic school.

- The cause for autism remains unclear, professionals, researchers and parents tend to agree on different causes or factors. The opposing views may affect the use of appropriate educational intervention.

- There is no consensus among professionals, researchers and parents regarding the cause of autism. However, recent studies have suggested a possible genetic contribution (Rodier PM2000), others have emphasized the possible link between MMR vaccine (Wakefield et al. 1998), environmental toxins, ear infections, allergies and diet and the use of oral antibiotic (Shaw 1998).

- The disagreement among professionals regarding the cause of autism and how children are affected by it, May influence the children's educational provision.

- No known cause for autism that is agreed on by all professionals, researchers and parents. This uncertainty can put all the parties involved in a dilemma and/ or in conflict on which is the best way to treat autism.

- Children with autism vary with their capabilities and abilities. Therefore, various approaches might be needed. For example, the PECS system might work well for a non -verbal child with autism but not for another non-verbal autistic child who might do better using a sign language system.

- The literature review highlighted the importance of an ABA programme in teaching children with autism using the Lovaas' model, which has research evidence to support its effectiveness. However, there is no data on the use of the AVB model, which is a more naturalistic way of implementing an ABA programme for children with autism.

- Some interventions used to help children with autism have research evidence that prove their efficacy while others do not.

- Some interventions and treatments were based on single cases, which have received lots of publicity such as Secretin, AIT, Homeopath, and Option.

- Brain plasticity: the maturation of the brain could be linked with the brain's plasticity and the rehabilitation of autism.

- There is a gap in knowledge in the literature regarding many educational interventions for children with autism. The reason to study the effects of implementing the AVB approach in teaching children with autism, and not other intervention because the researcher is a fully trained and experienced ABA/AVB therapist. In addition, there is considerable research supporting the ABA (Lovaas model). However, there is lack of research regarding the (AVB model).

This thesis will study the effects of implementing an AVB approach, in teaching children with autism in the areas of academic functioning, language functioning and adaptive functioning. The measurement of the children's progress will be evaluated and reported by the researcher, the independent psychologist, the teachers and the parents. Next chapter will discuss the methodology paradigm for this research.

Chapter 3- Methodology

This chapter will explore the methodological paradigm used for this thesis. The aim of this chapter is to look at the issues considered when determining an educational research project such as triangulation, validity and reliability, and reasons for choosing a particular method. This chapter will also define the purpose and the design of this research including research criteria, ethical considerations, and the implementation of the AVB intervention including training and assessment, data collection and analysis.

3.1 Methodology

The purpose of the research determines the methodology and design of the research (Cohen, Manion et al., 2000, p.73). The purpose of this research is to study the effects of implementing an Applied Verbal Behaviour programme AVB in an autistic centre which is attached to a mainstream school. This research examines the effects of implementing an AVB programme on the children's academic functioning, language functioning and adaptive functioning. Therefore, an intervention study was more appropriate to use than a pure experimental research. A pure experimental research was not possible to study the effects of an AVB programme on children with autism first, because of the small number

of children participated in the study and secondly it was quite difficult to find a comparison group to match the control one.

Cohen and Manion (2001, p. 181) outlined three broad approaches to educational research:

- The first approach is based on the "scientific paradigm" which can be tested by experimentation, replication and refinement.

- The second approach is based on understanding and interpreting the world, which could be described as interpretative and subjective approach.

- The third approach takes into account the political and ideological context of educational research, which could be described as critical educational research.

The paradigm, which suits this study, is the first approach "scientific paradigm". The essential feature of experimental research is that "investigators deliberately control and manipulate the conditions which determine the events in which they are interested" (ibid, p. 211). In other words, an experiment involves making a change in the value of one variable (the independent variable) and observing the effect of that change on another variable (the dependent variable).

3.1.2. Treatment Integrity

When conducting intervention-based research with children with autism, researchers have a professional and ethical responsibility to assess and report measures of treatment fidelity. This professional obligation is essentially important given the social significance of such research and its potential impact on the lives of children with autism and their families. Failure to address the independent variable as part of a research intervention may result in faulty assumptions regarding the perceived findings of a functional relationship between the dependent and independent variables (Peterson, Homer & Wonderlich, 1982).

Treatment integrity or fidelity has been defined as the degree to which an independent variable is implemented as intended (Peterson et al, 1982) .Treatment integrity is also important for the purposes of external validity and the replication of the procedures used in the intervention study. Replications reply on independent variables being operationally defined, monitored and reported in precise and reliable terms (ibid).

There are several methods by which researchers can address treatment integrity. Kazdin (1998) suggested that researchers give attention to specifying the criteria, procedures, tasks, and characteristics of those involved in the treatment, such as training the therapists, in how to carry out the intervention techniques that are central to the study. This can be accomplished according to Kazdin (1998) through a systematic training program with procedural guidelines that are standard across trainees.

Supervising the implementation of the treatment by using videotapes to ensure the treatment is being implemented in a reliable manner as part of the integrity check. Scheduling meetings on a regular basis with experimenters and finally, determine whether the treatment was successfully carried out as intended through analysis of videotapes which can be useful in ensuring the fidelity of the treatment implementation (Wheeler, et al, 2006).

Regardless of any method, behavioural research should attempt to assess whether treatments adhere to a standard protocol, in order to increase the probability that the independent variable is being reliably implemented (Gresham et al, 1993).

A review by (Wheeler, et al, 2006) was to analyze the published behavioural research studies (with children with autism) which were conducted between the years 1993 and 2004. This review was to determine the extent to which investigators had empirically evaluated treatment integrity, which is to document manipulation of the independent variable to determine whether such manipulations result in reliable changes in student behaviour (Peterson et al, 1982).

Wheeler's review (2006) sought to systematically replicate a similar analysis reported by Gresham et al., (1993) who analyzed treatment integrity in behavioural intervention research with children between 1980 and 1990. The earlier analysis by Gresham et al., (1993) was limited to studies published in the journal of Applied Behaviour Analysis (JABA). Whereas Wheeler's et al., review encompassed JABA and other journals known

to publish such research (wheeler et al., 2006). Of the 60 intervention studies analyzed the current empirical review, only 11 (18%) actually assessed and reported treatment integrity data. These results of the current analysis by Wheeler et al. (2006) are in line with prior investigations such as Peterson et al., (1982) found that only 20% of 539 studies of behaviour interventions with children and adults published in JABA between 1968 and 1980 included measures of treatment integrity. While Gresham and his colleagues (Gresham et al., 1993), reported that only 15.8% of 25 treatment intervention studies published in JABA between 1980 and 1990 reported measures of treatment integrity.

Despite differences in subject population, it would appear that applied behavioural researchers have largely continued to ignore the collection of treatment integrity data (wheeler et al., 2006).

3.1.3 Types of experimental research:

Studies of intervention methods has to evaluate functional outcomes that are important to a child's overall health or development or are important for the family or society (Clinical Practise Guideline, 1999).

Studies using group designs had to be controlled trials, evaluating a group receiving the intervention, compared to a group receiving different intervention:

- Assigning subjects to groups either randomly.

- Using equivalent methods for measuring baseline subject's characteristics and outcomes for all groups studied.

- Studies using single- subject designs.

Single subject methodology is an approach to determine the effect of an intervention on an individual. In contrast, group research designs focus on differences between groups resulting from different interventions.

3.1.3.1. Types of Experimental Research: Group Design

- A pre-experimental design is the one group pre-test/post-test: The researcher tries different treatments (independent variable) to see their effects (dependent variables).

- A "true" experimental design is the pre-test/post-test control group design: In simple experiments comparing 2 methods and trying to control all extraneous variables that might affect outcome.

- A quasi –experimental design: the non-equivalent control group design. Sometimes using of a single subject research such as intensive study of single individual or group over time.

Designs in educational experimentation use symbols as indicated in the table (3.1), the use of symbols and convention are from Campbell and Stanley (1963):

1. X	Represents the exposure of a group to an experimental variable or event, the effect of which are to be measure.
2. O	Refers to the process of observation or measurement.
3. Xs and Os	In a given row are applied to the same persons.
4. L to R	Left to the right order indicates temporal sequence.
Xs and Os	Vertical to one another are simultaneous.
6. R	Indicates random assignments to separate treatment groups.
7.	Parallel rows un-separated by dashes represent comparison groups equated by randomisation, while those separated by dashed line represent groups not equated by random assignment.

Figure (3.1) The use of symbols in the designs in educational experimentation

a) A pre-experimental design

The pre-experimental design is the one group pre-test/post-test: for this type of design, the researcher tries different treatments (independent variable) and to see their effects (dependent variables). The researcher has chosen the pre-experimental design for this research for the reasons mentioned earlier at the beginning of this chapter. In this design the researcher has measured performance of specific skills of children with autism at "The Autistic Centre" on a dependent variable (O1), then she introduced an experimental manipulation (X), the implementation of an AVB programme which is designed to teach children with autism in the areas of academic functioning, adaptive functioning and language functioning. Following the experimental treatment, the researcher has again

measured group's performance of specific skills (O2) and proceeded to account for differences between pre-test and post-test scores by reference to the effects of (X). The one group pre-test-post-test design can be presented as:

Experimental	O1	X	O2
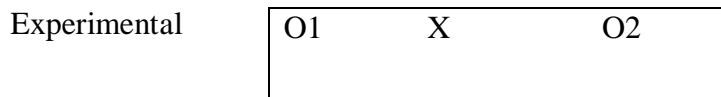
In this design, the researcher finds that (O2) scores indicate progress in the children's performance than (O1) scores. This would lead to a question how justified is the researcher in attributing the cause of O1-O2 differences to the experimental treatment (X). The reader may care to reflect upon some possible influences other than the duration of the AVB intervention that might account for the O1-O2 differences. The reader may conclude that factors to do with the students, the teacher, the school, the classroom organisation, the curriculum materials, the way the student's performance were measured etc.. These factors might have exerted some influence upon the observed differences in the children's performance. These kinds of extraneous variables which are outside the experimenter's control in one group pre-test/post-test designs might threaten the validity of the research. In order to minimise the risk of invalidity, the teachers, the parents and the independent psychologist will measure the children's performance of specific skills. The reader is advised that the researcher and the teachers have measured the children performance at baseline (pre AVB) and post AVB intervention, the nature of the AVB approach is teach the children the required skills in gradual steps, teaching each skill on its own in one setting, with one participant at time and then generalise the acquired skill to other setting. (multiple baseline design). Although children's measurement were taken at baseline and post AVB intervention, daily data of performing a specific skill was

taken on each individual child (see Appendix O). The use of multiple baseline design for this study can control for the extraneous factors that might influence the findings.

b) A "true" experimental design

The true experimental design is the pre-test/post-test control group design: In simple experiments comparing 2 methods and trying to control all extraneous variables that might affect outcome. This method needs control over assignment to treatment and control groups in order to make sure they are equivalent.

The pre-test/post-test control group design can be represented as:

Experimental	RO1	X	O2
Control	RO3		O4

This research design differs from the pre-experimental design that it involves the use of two groups which have been constituted by randomization, in order to identify the essential features of what the term of "true experimental" and what Kerlinger (1970) refers to as a "good design". This chosen design is commonly used in educational experimentation. Kerlinger (1970) notes that the addition of the control group and the random assignment of subjects to groups that radically alter the situation from that which obtains in the pre-experimental design. For instance, if the groups are made equivalent, then any "clouding effects" should present in both group. (Cohen, et al., 2001).

To validate the effect of the intervention, the two groups (intervention and control) should be comparable at the baseline. The two groups should be selected from the same population. The difference between the two groups at the end of the study is a sign of an effect of the intervention.

For several types of intervention studies, balance at baseline is a sufficient condition for an interpretable result at the end. However, medical treatments or therapy need to show their effectiveness apart from their psychological impact, which also called the placebo effect.

c) A quasi –experimental design

The quasi-experimental design is the non-equivalent control group design: This design is sometimes used for single subject research such as intensive study of single individual, or group over time.

Quasi –experimental designs in educational research can be represented as:

Experimental

O1	X	O2
--		
O3		O4

Control
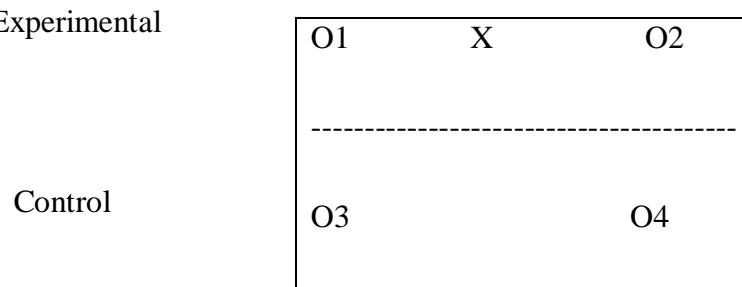
Kerlinger (1970) refers to quasi-experimental situations as "compromise designs". This design is applied in educational research where the random selection or random assignment of schools and classrooms is quite impracticable. Where the matching is not possible, the researchers can use samples from the same population or samples that are alike as possible (Kerlinger, 1970). However, this research design might lead to different group means (or results) on post-test measures (Campbell and Stanley, 1963).

3.1.3.2 Single Subject Research Design: Multiple Baseline Design

Single-case experimental research designs are becoming more popular and acceptable ways to conduct classroom-based research (Birnbrauer, Peterson, Solnick, 1974; Gay & Airasian, 2000; Neuman & McCormick, 1995; Richards, Taylor, Ramasamy, & Richards, 1999). There are a variety of single-case research designs that can accommodate a range of instructional strategies and research questions. This section provides examples and reasons for using the multiple baseline design with this study. The effectiveness of multiple baseline designs are also examined in relation to the following experimental design issues: control, replication, causal relationships, internal and external validity and ethical concerns.

Single-case, or single-subject, experimental research design can personalize the data collection process because data is collected on each subject, or participant, and is individually analyzed. The term single-subject is not used because there is only one participant; rather, it refers to the procedure for data collection and the focus of the study as opposed to the number of participants. (Neuman & McCormick, 1995). Additionally, experimental control is established with each participant (Cooper, Heron, & Heward, 1987: Johnston & Pennypacker, 1993).

Gay and Airasian (2000) agree that single-subject designs may be beneficial for use in the classroom due to the limited size of accessible population. For example, in special education classroom, the numbers of students in self-contained or resource rooms are generally small making single-case designs useful. "Approximately one third of all data-based interventions conducted on students with learning disabilities use single-subject designs" (Swanson, Hoskyn, Sachse-Lee, & O'Shaughnessy, as cited in Swanson & Sachse-gee, 2000, p. 144).

There are several types of designs to choose from when utilizing single-case research. The most familiar types include the withdrawal design, reversal design, multiple-baseline designs, and the alternating treatments design (Gay, 1987; Gay & Airasian, 2000: Neuman & McCormick, 1995: Richards et al., 1999). Of these options the multiple

baseline design offers a considerable degree of flexibility in classroom research (Swanson & Sachse-Lee, 2000).

Multiple baseline designs provide a means for collecting multiple sets of data in a single-case experimental design (Neuman & McCormick, 1995). The multiple baseline design is the design of choice when it is not possible for subjects to return to original baseline (Hersen & Barlow, 1984; Gay 1987; Gay & Airasian, 2000; McReynolds & Kearns, 1983). For example, once a student has learned a new strategy for decoding words is not desirable, and in many cases possible, to have the student unlearn the new skill.

The purpose of the multiple baseline designs is to differentiate between normally occurring variation in the person's behaviour and the effects of the AVB intervention. As used below

- The term "A" is used to identify a period when not treatment is given.
- The term "B" refers to the intervention phase, in which the treatment procedure is introduced in a controlled fashion.

Multiple baseline designs refer to conducting measurement of several dependent variables, subjects, or settings simultaneously to examine sources of possible extraneous factors that may be influencing behaviour change.

In a multiple baseline design, the intervention is evaluated by examining behaviour across different baselines. The intervention is introduced to different baselines at different points in time and a functional relationship is demonstrated if the behaviour changes only when the intervention is introduced. The multiple baseline design is essentially made up of 2 or more A-B (A is the participant; B is the intervention) designs and when the researcher can show that behaviour only changes when the intervention is introduced, s/he is ruling out the possibility of extraneous variables.

For example, a teacher is working with a child (Karl) who eats too fast and it's a big problem because at the rate at which he eats, there's a risk of the child choking on his food. It is inappropriate to use an "ABAB" design, because if the teacher finds an intervention (Applied Verbal Behaviour) that results in the child eating slower, then it would be unethical to remove the intervention due to fact that the behaviour of eating too fast could potentially harm the child – but, the teacher still wants to find a way to demonstrate a functional relationship, so she may decide to use a multiple baseline design across settings, so she is first going to implement the AVB intervention at school and then she is going to implement the intervention at home. Well, when the teacher implements the intervention at school and the behaviour ends up changing at school before she had a chance to address the behaviour at home, then she has lost experimental control – if behaviour changes at the same time, someone could say that it didn't change as a result of AVB intervention. In contrast, if the child continues eating fast at home but starts slowing down at school, then chances are that the change in behaviour occurred

because of AVB intervention and the teacher experimentally demonstrates this when she implements the intervention at home and then behaviour changes at home.

In a multiple baseline design, simultaneous baseline data are collected on two or more behaviors. After stable responding has been achieved, then the independent variable is applied to one of the behaviors while baseline conditions are maintained for the other behaviors. After change has been observed in the first behavior, the independent variable can be applied sequentially to each behavior in the design. Three four types of multiple baseline design are:

(a) Multiple baselines across different behaviors of the same subject.

(b) Multiple baselines across the same behavior of different subjects.

(c) Multiple baseline of the same behavior of one subject across different settings.

(d) Combination of the above.

There are four types of multiple baseline designs. These include the multiple baselines across behaviors, subjects or participants, and settings or combination of the three. (Cooper, Heron, & Heward, 1987; Gay, 1987; Gay & Airasian, 2000: Hersen & Barlow. 1984; Kazdin & Kopel, 1975; McReynold & Kearns, 1983: Neuman & McCormick, 1995). Alberto and Troutman (2003) provide the following examples for potential behaviors of interest to classroom teacher: a multiple baseline across behaviors can study talking out and out of seat behavior. A multiple baseline across participants could target

spelling accuracy for multiple students. And a multiple baseline across settings might examine a student's inappropriate behavior of swearing in recess and the cafeteria. In literacy research, almost any question involving a dependent variable and independent variable can be asked provided the answer can be obtained by a few participants. For the purposes of illustrating a technical application, the multiple baseline across participants design, will be used as an example. The multiple baselines across participants address the impact of the treatment of the independent variable on the dependent variable, the same behavior, for different participants. Once a baseline has been established, the treatment or independent variable is applied to one of the participants. So, for example, two children who both engage in stereotypy behaviours; the teacher takes baseline data for both children, then she intervenes with (child 1) while (child 2) is still in baseline; once the first child's behaviour starts to change, she then introduces the same treatment for the second child. It's important to note that in a multiple baseline design, the treatment conditions have to be the same regardless of whether the teacher has a multiple baseline design across subjects, behaviours, or settings. The reasoning behind this design is that if one participant shows improvement when treatment is started it is probable that improvement is due to the treatment. If gains were reflected in the other participants' behaviors even though they were in baseline, a conclusion could not be made that the independent variable was the most probable reason for the observed changes.

The second type of multiple baseline design is a multiple baseline across behaviours, where the researcher has a baseline and treatment phase for 2 or more behaviours of the same subject. For example, the teacher has one child who has general problems with

self-care skills; rather than trying to tackle each problem all at once s/he decides to first teach her to brush her teeth by herself, then to brush her hair, and then to wash her hands. In this example, while s/he is working on brushing teeth, s/he is still taking baseline data on brushing hair and washing hands. Once s/he seen an improvement in "brushing teeth target" and the data are stable, then s/he would work on brushing hair, and s/he continues to work on the tasks until she has taught the child, to engage in each behaviour. So with a multiple baseline design across behaviours, experimental control is demonstrated when each behaviour changes only when the intervention is implemented.

The last variation is a multiple baseline across settings designs. In this design, the researcher implements baseline and treatment in 2 or more settings, in which the same behaviour of the same subject is measured. So, for example, the teacher wants to increase appropriate table manners of a child at both school and when they go out to restaurant; she first teaches the child the table manners at school while she is taking baseline data on table manners in a restaurant; once the table manners have improved and stabilized at school, then she works on table manners in the restaurant.

Multiple baseline designs are appropriate to use when the researcher is interested in the same target behaviour that's exhibited by more than one child, or if she has targeted more than one behaviour of the same subject, or if she wants to measure a child's behaviour across 2 or more settings. One advantage of using a multiple baseline design is that the researcher doesn't have to withdraw treatment, so if she can't use a reversal design because it would be unethical to withdraw treatment or because it's not likely that

behaviour will revert back to baseline levels when the treatment is withdrawn, then a multiple baseline design would be appropriate.

There are a few ways in which multiple baseline designs may vary. The first variation involves the number of baselines that are included. The researcher has to have a minimum of 2 baselines, or by definition, she wouldn't have a multiple baseline design. Typically, 3 or more baselines are included and the number of baselines she has, contributes to the strength of the demonstration. In other words, the effects of AVB intervention will be clearer if she is able to show that behaviour changes only when the intervention is implemented across several baselines. Also, it's better to include several baselines in case one of the baselines doesn't change. If one of the baselines doesn't change and she only included 2 baselines, then she cannot demonstrate a functional relationship between the intervention and behaviour. But, if she had 5 baselines and one of the baselines didn't change, then she has still demonstrated that AVB intervention had an effect, because the other baselines may show that when the intervention was implemented behaviour changed as predicted.

Another way in multiple baseline designs can vary has to do with partial applications of treatment. Specifically, some of the baselines may not receive all of the treatments that were implemented. If the researcher implement a treatment for the first baseline, and it turns out that the treatment was not effective, she may decide not to apply that treatment to the other baselines. In this situation she might decide to try another intervention with the first baseline and if this intervention is effective, she would then implement it with the

rest of the baselines. So, essentially, the first baseline would be exposed to 2 treatments whereas the rest of the baselines would only be exposed to the second treatment.

The researcher might also have a situation in which one of the baselines never receives treatment. The last baseline might serve as a control condition. For example if the researcher has a multiple baseline design across behaviours; if she intervenes on the first 2 behaviours but keep the 3rd behaviour in baseline throughout the entire course of the study, then she can compare the behaviours that received treatment versus the one that didn't to see how much of an impact the intervention had. She might also have a situation in which the behaviour that doesn't receive treatment is an appropriate behaviour. For example, a common problem among children and adolescents with disabilities is masturbating in public. The researcher has worked with several children with autism, so this might be another situation in which she would want to use a multiple baseline design across settings and punish masturbation if it occurs at school or in a public setting but not when it occurs when the child is in the privacy of his own room because it's not that masturbation is inappropriate; it's only inappropriate when it occurs in the presence of others.

There are two variations of the multiple baseline design, the multiple probe design and the delayed baseline design. In the multiple probe design, intermittent measures are taken at the beginning of the experiment and thereafter each time a subject has mastered one of the behaviors or sequential skills. True baselines are conducted for each behavior prior to

instruction. This design is useful for evaluating the effect of instruction on skill sequences when it is unlikely that the subject will master later steps without instruction. It is also useful for situations where a prolonged baseline could have negative effects for the subject or the experiment.

In the delayed baseline design, collection of baseline data for subsequent behaviors is begun after baseline for earlier behaviors. This design may be used when a planned reversal is no longer possible, resources are limited, or a new behavior or subject becomes available.

Behaviors of interest must be functionally independent and share a reasonable likelihood of responding to the independent variable. They must be measured concurrently and interventions cannot be applied to the next behavior until the previous behavior change has been established. There should be a significant difference in the length of baseline conditions between the different behaviors and the independent variable should first be applied to the behavior demonstrating the greatest level of stable responding in baseline.

a) Advantages of using multiple baseline design:

There are some advantages to using the multiple baseline design (Hersen & Barlow, 1984; Gay 1987; Gay & Airasian, 2000; McReynolds & Kearns, 1983). The advantages include the fact that:

- It does not require withdrawing a potentially effective intervention.

- Sequential implementation of the independent variable parallels the practice of many teachers and clinicians.

- The concurrent measurement of multiple behaviors allows direct monitoring of generalization of behavior change.

- The design is relatively easy to conceptualize and implement.

b) Limitation of a Multiple Baseline Design

Limitations of the multiple baseline design include the fact that:

- if behaviors are not functionally independent, the design may not demonstrate a functional relationship even though one may exist,

- Because verification must be inferred from the lack of change in other behaviors, the design is inherently weaker than the reversal design at demonstrating experimental control.

- it is more an evaluation of the independent variable's general effectiveness than an analysis of the behaviors selected for study,

- It requires considerable time and resources.

Multiple Baseline Designs are limited (Christ, 2007; Barlow& Hersen,, 1984; Gay & Airasian, 2000, Kazdin, 1998). Limitations of using multiple baseline designs are as follows:

- **Interpendence of Baselines:** One problem that the researcher can have when using a multiple baseline design is what's known as interdependence of baselines. This refers to when a change in one of the baselines carries over to another baseline even though the intervention has not been applied to that baseline. When using a multiple baseline design, the researcher demonstrates experimental control when behaviour changes for each baseline only when the intervention is introduced and not before, so if she gets interdependence of baselines where the behaviour in one of the baselines changes before she had a chance to introduce the treatment, then she has lost experimental control. This is more likely to occur when using a multiple baseline across behaviours design because the researcher gets response generalization. It might also occur when she is using a multiple baseline design across participants, especially if other participants are able to observe the consequences the first participant is exposed to. Finally, when using a multiple baseline design across settings, the behaviour might generalize across settings, in which case she would not be able to demonstrate a functional relationship.
- **Inconsistent Effects of the Interventions:** Another problem that can occur with multiple baseline designs is inconsistent effects of the intervention, in which some behaviours are altered when the intervention is introduced and others are not.

Again, this is a problem because each behaviour doesn't change at the point the intervention is introduced which is what is required in order to demonstrate a functional relationship.

- **Prolonged Baselines:** A final problem associated with multiple baseline designs is prolonged baselines. Multiple baseline designs depend on withholding the intervention from each baseline for a period of time which may be considered unethical, especially if it's clear that the intervention is effective. Another problem with prolonged baselines is that performance may start to improve before you have a chance to intervene either due to interdependence of baselines (so the behaviour might generalize across settings, for example) or behaviour simply because the child is getting repeated practice while they're in baseline. A final problem with prolonged baselines is that sometime undesirable behaviour can emerge. For example, repeated assessment in baseline may be associated with boredom. The problems with prolonged baselines can typically be avoided. With respect to the ethics of withholding treatment for a long period of time, this problem is typically avoided in that multiple baseline designs usually don't include a large number of baselines; therefore the delay to applying the intervention to each baseline isn't that long. Another way to decrease the delay is to implement the intervention for 2 baselines at a time. For example, if researcher has a multiple baseline design across 6 behaviours, she can extend the treatment to each of the behaviours two at a time.

3.1.4. Research Method

This study has set out with two aims:

A. To study the effects of implementing an AVB programmes on children with autism regarding the children's academic functioning, language functioning and adaptive functioning.

The first aim will be investigated through four main questions:

1. Is AVB effective in teaching children with autism in the areas of Academic skills, Social skills, Self-help sills and Gross Motor skills?

2. Is AVB only effective as an early intervention?

3. Will the children be more co-operative with teacher/parents requests while receiving AVB?

4. Is AVB an effective way to reduce mal-adaptive behaviour?

B. To study the effects of implementing the AVB on the children's parent by measuring their stress level before the intervention and after.

In order to answer the research questions, many methodologies are necessary for the reason of triangulation and concurrent validity and reliability such as an intervention study, questionnaires for teachers and parents, and standardized Parenting Stress Index PSI Short Form for the parents.

3.1.5 Triangulation

As children with autism vary greatly in their capabilities and abilities, multiple methodologies are necessary to gain answers to specific research questions i.e. triangulation. Triangulation may be defined as the use of two or more methods of data collections in the study of some aspect of human behaviour (Cohen, et al, 2001). In other words studying human behaviours from more than one stand points and in order to achieve this stage, is to make sure to use both quantitative and qualitative data. The reader is advised that the use of qualitative data for this study was gathered from the open ended questions on the Evaluation Form by parents and teachers (Appendix J). Relying on one method could produce bias research and distort the researcher's picture of the particular slice of reality (Cohen, Manion, 2001). Triangulation can be a useful technique where a researcher is engaged in an intervention study. In other words it is useful technique when doing an intervention study research where multiple data sources are superior to single data source. Therefore, it is appropriate to use quantitative and some qualitative approaches to collect data assessments and tests of the children at school. For this research, the following assessments were used:

- Childhood Autism Rating Scales C.A.R.S (Eric Schopler et al., 1988). CARS, was conducted by an independent psychologist. (See Appendix G).

- The Behavioural Language Assessment "The BLAF" (designed by Partington & Sundberg 1998); (see Appendix H).

- The Assessment of Basic Language and Learning Skills "The ABLLS" (Partington & Sundberg 1998).This is an extensive list of testing (criterion

reference tests) and can't be included in an appendix only a summary of the major items would be included (see Appendix I).

- Evaluation Form by staff and parents; (see Appendix J).

- Parenting Stress Index PSI Short Form (Psychological Assessment Resources Inc, 1995). (See Appendix K).

3.1.6 Validity and Reliability

"How do we know the research is valid and reliable?" this section will explore the concept of validity and reliability.

a) Validity:

Validity refers to the "integrity of the conclusions that are generated from a piece of research" (Bryman, 2001, p. 30). In other words, validity is concerned with the researcher's interpretation of the data generated (Cohen, Manion, et al., 2000). In qualitative data there are numbers of methods address the issue of validity such as the honesty, depth of the data achieved, the participants approached, the extent of triangulation and the objectivity of the researcher. In quantitative data validity might be improved through careful sampling and appropriate statistical treatment of the data (Cohen et al). To minimize invalidity in this study, a base line assessment and post intervention assessment using "CARS" was conducted by an independent psychologist. The teachers administered the pre & post assessments of the children while the researcher was observing the assessment and collecting data, the reader is advised that the pre & post assessments of all children participated in this study were videotaped in order to

allow the teachers and parents for cross checking. In addition, teachers and parents have completed evaluation questionnaires of the children's performance. To minimize the risk of invalidity of questionnaires or interviews, the respondents had the opportunity for cross checking.

The standardised tests such as PSI Short Form which has been used for this research have been validated in trans-cultural research involving populations; Italian, Portuguese, Latin American Hispanic and French Canadian. These studies have demonstrated comparable statistical characteristics to those reported in the PSI SF manual. (PSI SF, 1995).

The validity of questionnaires can be seen from two viewpoints first, if the respondents who completed the questionnaires do it honestly and accurately. Secondly, whether those who fail to respond would have given the same answers as the returnees. (Belson, 1986). As for the first viewpoint by (Belson, 1986) the parents and teachers of the participated children in this study had to complete similar questionnaires, in order to evaluate their children's progress, and to minimise the risk of invalidity of their questionnaires, both teachers' and parents' questionnaires were compared in order to find any difference in the reporting of their children's progress or lack of progress. As for the second issue of validity of questionnaires, for this type of study the sample was small and both parents and teachers had filled in the questionnaires and crossed check it, as a result, all respondents had completed the questionnaires.

b) Reliability:

"Reliability is concerned with the question of whether the results of a study are repeatable" (Bryman, 2001, p.29). In other words, for the research to be reliable it must demonstrate that if the research is carried out on similar group a similar result would be found. Research must be reliable in order to be valid.

Le Compte and Preissle (1993, p. 332) suggest that the canons of reliability for quantitative research may be simply unworkable for qualitative research. Quantitative research assumes the possibility of replication; if the same methods are used with the same sample then the results should be the same.

Bogdan and Biklen, (1992, p. 48) state that; "in qualitative research, reliability can be regarded as fit between what researchers record as data and what actually occurs in the natural setting that is being researched".

In addition, there is a range of issues which might affect the reliability of the tests, such as the time of the day, the individual's motivation, concentration, carelessness etc… The researcher has checked with the teachers and consulted them on the children status and their well being.

All the tests and questionnaires which were conducted were under the supervision of Professor Roy Evans. All children involved in this study had a written consent form

signed by their parents (including videotaping). In addition parents were given the researcher's contact details. All names and identifying details were kept confidential, and those participating in this study had the opportunity to withdraw at any time.

3.1.7 Intervention study (multiple Baseline Design)

An intervention study model was chosen to answer the research questions. In experimental settings, researchers often manipulate a variable (the independent variable) to see what effect it has on second variable (the dependent variable) (Levine & Parkinson, 1994). When the researcher may confidently attribute the observed changes or differences in the dependent variable to the independent variable, and when s/he can rule out other explanations, then this causal inference is said to be "internally valid" (Libert, & Libert, 1995).

a) Threats to Internal Validity:

- **Selection Bias:** Subjects characteristics selection is bias when subjects in study differ from each other (on age, ability, gender etc...). For this study there was only one group and selection bias does not apply here (see also criteria for using the sample).

- **Loss of subjects:** must address question of whether those dropping out are different than those who did not. All the participated children in this research continued their participation to the end of this study. A limitation of this research was that in the first year there were only 3 children enrolled at "The Autistic Centre" another 7 children joined the research in the second year of the research.

The outcome of the first 3 children would not be any different from the rest of children involved in this study?

- **Maturation:** subjects change during the course of experiment or event between measurements. For example, young children might mature and their ability to concentrate may change as they grow up. Permanent changes such as physical growth and temporary ones like fatigue may change the way a subject would react to the dependent variable. One might argue that upon completion of the intervention study the researcher may not be able to determine if the cause of the discrepancy is due to time or the independent variable. For this type of research the researcher have used methods to involve as many parties as possible in order to measure the children's progress in order to attribute the outcomes of the children to the AVB intervention, The AVB intervention used for this study was based on multiple baseline designs across behaviours, participants and settings, in order to demonstrate a functional relationship that the child's behaviour changes only when the AVB intervention is introduced.   In addition, most of the participated children had a pre-AVB evaluation (one year before the AVB intervention) that measured the children's performance at their previous schools.

- **Repeated testing:** repeatedly taking the same test intelligence tests usually leads to score gains. Repeatedly measuring the participants may lead to bias as participants may remember the correct answers. For this research, tests and assessment were conducted twice (pre & post AVB intervention). The reader is reminded that although children were taught new skills by the use of prompts and

prompts fading and reinforcement etc… (See teaching procedures in chapter 4), the tests were only conducted twice: pre & post AVB intervention.

- **Regression towards the mean:** Low scores do better in subsequent tests while high scores do worse. The type of errors occurs when subjects are selected on the basis of extremes score (one far away from the mean) during the first test and score closer to the mean with the second test. For this research the children were tested and diagnosed with autism by an independent psychologist and the enrolled children in this study had different scores and were diagnosed with moderate or severe autism.

- **Location:** experiment variable: characteristics of the school, classroom etc… may be interfering with the cause/effect relationship (keep constant for both groups). In this type of study there was only one group.

b). External Validity

External validity is the validity of generalized causal inferences in scientific studies usually based on experiments as experimental validity (Mitchell & Jolley, 2001). A definition by Cohen et al., (2001, p. 109): "External validity refers to the degree to which the result can be generalized to the wider population, cases or situations".

The most common loss of external validity comes from the fact that experiments using human participants often employ small samples obtained from a single geographic location or with idiosyncratic features (such as volunteers). Because of this, researchers

cannot be sure if the conclusions drawn about cause and effect relationship do actually apply to people in other geographic locations.

c) Threat to External Validity

A threat to external validity interacts with the independent variable. When generalizability is limited when the cause (the independent variable) depends on other factors such as:

- **Situation:** all situation specifics of a study might potentially limit generalizability such as treatment condition, location, time, noise, treatment administration etc…). For this research to be generalized, the AVB programme must be implemented in an attached unit with similar condition (sample size in each classroom). Teachers and parents must receive training in the use of AVB etc...

- **Reactivity:** (Placebo): if cause-effect relationships are found, they might not be generalizable to other settings or situations if the effects found only occurred as an effect of studying the situation. Children's performance of specific skills were measured and evaluated by four parties that might minimize the risk of placebo effects.

The purpose of the thesis is to study the effects of implementing an AVB programme on the children with autism regarding their academic, language and adaptive functioning in addition to the educators and parent's evaluation. It is important to define "the unit of analysis" as Yin (1994) suggests. The intervention study is therefore, children with

autism who are attending classes attached to a mainstream school. The participants of this study are 10 children. The study was done over two academic years. Children were recruited to the programme using the snowballing routines i.e. number of children enrolled increased year by year to a maximum of ten children. In the first year only three children were involved in the study and another seven children joined them in the second year, all the children are diagnosed with autism by an outside agencies and the researcher had the chance to confirm the diagnosis using the DSM-IV.

The intervention study for this thesis took place at the Autistic Centre (All names and identifying details for the centre as well to the individuals them-selves have been changed).

3.1.8 Section 1: Purpose of the Research and Methods

The following flow chart shows the planning sequence of the research and the course of action the research has taken:

Section 1
Purpose of research
and Methods

Purposes of research identified
Research criteria identified
Ethical Considerations

Section 2
Design of the research

Planning the Research
Training
Children's assessments

Implementation of AVB Programme
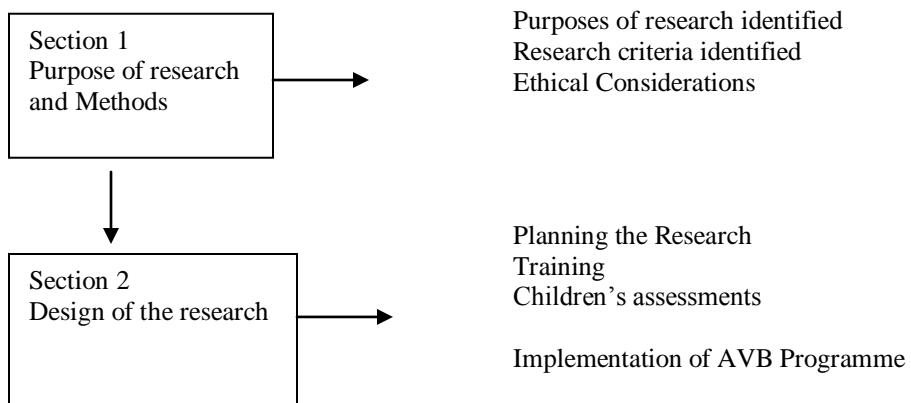
Figure (3.2) Purposes of the Research & Methods

This section will describe the following issues; purpose of the research, the research criteria, ethical consideration, and the sample.

The purpose of the research is to study the effects of implementing an AVB programme on children diagnosed with autism in the areas of adaptive, language and social functioning. The Intervention is to work to support parents, work to train key workers, work on children in accordance with the principles designs of the AVB programme. (Detailed information in Chapter 4).

3.1.8.1 The Research Criteria

The research criteria which are listed in Figure (3.3) were identified for choosing the autistic Centre in which the implementation of an AVB programme was conducted.

1. Location of school/centre for autism in an attached unit.
2. All children have the diagnosis of autism.
3. Children's age range from 3 to 11 years old.
4. Willingness to fully implement an AVB Programme.
5. School/Centre consent.
6. Parent consent.

Figure   (3.3)   Research Criteria

The intervention study was designed to try out the proposed AVB programme on a small number of nursery/primary schools of children with autism, in order to meet the research criteria the chosen school or centre must provide education for children with autism. The

centre should be attached to a mainstream school. In addition the school should be willing to allow full implementation of an AVB programme.

There are few centres in Lebanon which provides provision and services for children with autism. The quality of the services was in the area of providing cares and accommodation while the use of structured educational provision was limited.

One of the centres in Lebanon which is run by a Lebanese Society was interested in this study but unfortunately, a new society's president was elected who did not give consent for the researcher to conduct the study at their centre.

The researcher and a team of professionals (psychologist, social workers and Paediatrician) have established an autism society in Lebanon in order to implement The AVB programme in their centre which was given the name of: The Autistic Centre which was attached to a mainstream school.

At The Autistic Centre, teachers and parents were trained by the researcher in order to implement the AVB programme and conduct assessments of the children using the relevant tests (for more details see Chapter 4).

The Autistic Centre has granted its consent for the research in addition, the centre has encouraged the parent to grant their consent on behalf of their children.

3.1.8.2 **Ethical Considerations**

Ethical issues may arise in each stage in the research sequences, which may be a potential source of ethical problems. Ethical issues related to this study are as follows:

1. Issues relating to informed consent.

2. Participant's right to privacy: Anonymity and Confidentiality.

3. The participants and the researcher safety: Physical issues and psychological issues.

4. Issues relating to power.

5. The fidelity in delivering the intervention.

1. Issues relating to informed consent:

The principles of informed consent arise from subjects' right to freedom and self-determination (Cohen, L, et al, 2001). The participant has the right to refuse to take part or to withdraw from the research at any time. Thus, informed consent implies informed refusal. All the participants will be given information about the aims, the procedures, and outcomes of the research. As the main participants of this study will be children with autism, the issue of advocacy applies here; the requirement of informed consent would be met by obtaining the head teacher's permission to provide the researcher with a signed informed consent by the parents (see Appendix L).

2. Participant right to privacy:

Protecting the participants' right to privacy by Anonymity and Confidentiality.

a. Anonymity:

All information provided or obtained by the participants should not in any way reveal their identities. Anonymity is ensured by not using the names of participants or any other personal means of identification. Hence, the school's name and all participants' names will be changed. Identifying information will also be separated from the research data.

b. Confidentiality:

Protecting the participant's right to privacy through the assurance of confidentiality:

- All identifying information gathered about the participants will be limited to my supervisor and me.

- Information will be treated with strict confidentiality.

- Releasing general information rather than specific (year of birth only rather than the specified date etc…).

- Interviewers will have the opportunity to verify statements when the research is in a draft form. (Bell 1991).

- The use of video recording when conducting any assessments and tests, and the audiotapes for interviews. Limiting the number of people who watch the videos or hear the audiotapes to the supervisors and the researcher and only those who have granted consent.

3. The participants and the researcher safety:

a. **Physical issues:** some children with autism have disruptive and aggressive behaviours towards themselves and others. As part of this study and in order to reduce the mal-adaptive behaviours, a functional assessment must be conducted to

determine the function of the behaviour. There are four classes of controlling variable for aggressive or self-injurious behaviour (Brian A. Iwata, Richard Smith, et al. 2000):

- Socially mediated positive reinforcement: the function of this behaviour is to get/seek attention.

- Socially mediated negative reinforcement: the function of this behaviour is to escape and/or avoidance of demands.

- Automatic positive reinforcement: the function of this behaviour is to engage in self-stimulatory behaviour.

- Automatic negative reinforcement: this behaviour should be checked first to rule in or out where the child needs medical attention.

The researcher is a trained ABA/AVB therapist; she is experienced to deal with disruptive and aggressive behaviours, which might be exhibited by children with autism.

b. **Psychological issues:** Placing demands on autistic children from a total stranger can trigger some aggressive and mal-adaptive behaviour. Therefore, the use of "positive pairing technique" (see chapter 4) is going to be used to get the children to relate to the researcher and to get them used to her presence. She would be pairing her-self with the student's teacher. She will be seeking my supervisor support when needed.

Children with autism have good and bad days to function. Therefore, conducting any assessments or tests should be determined with the teacher to rule out any medical conditions, which might affect the validity of the tests. There is a range of issues which might affect the reliability of the test, such as the time of the day, the individual's motivation, concentration, etc…

4. Issues relating to power:

There are issues of power relationship between the researcher and the participants. As the participants of this study are children with autism, they are particularly a vulnerable group of people. As mentioned earlier, the researcher will be pairing herself with the children's teacher in order to protect the children and not cause them harm by bringing a complete stranger to them. Regarding her absence after finishing the research programme, the researcher is going to gradually decrease my presence where the staff will be trained enough to carry on the programme on their own.

Information gathered from the participants will be analysed as data for the research, which will automatically be controlled by the researcher.

5. The fidelity in delivering the intervention:

How faithfully staffs are in delivering the intervention of AVB? In order to ensure the fidelity of implementing the AVB approach, the researcher will be present at the school five days a week. This is to provide supervision and consultation for the staff.

Do the children experience the programme all the time? As the absence of children might affect the outcome of research, the researcher will have access to the attendance registration.

As the centre has met the first four research criteria, the next step was to obtain ethical consent from the university.

In the letter to the University's Ethical Committee, numbers of ethical issues were identified for consideration.

1. School consent.
2. Parental consent.
3. Participant right to privacy (anonymity &confidentiality).
4. The participants and the researcher safety (physical & psychological; issues.
5. Issues relating to power.
6. The fidelity in delivering the AVB Intervention.

The first two issues are related to informed consent by school and parents. This would include obtaining consent from both parents and school in order to access files/records of the children participated in this study; conducting assessment and collecting data including video footages of the children and their teachers; working with the children, conducting training and teaching sessions for the teachers. (For more information please refer to Ethical issues section).

As for the third issue protecting the participant right to privacy by Anonymity and confidentiality, all information provided or obtained by the participants must not in any way reveal their identities. All the participants' names have been changed including the school and the children's names, in addition to any identifying information which were separated from the research data and only limited to the researcher and the research supervisor.

As for the fourth issue which is regarding the participants and the researcher safety including the physical and psychological issues. Some children with autism have disruptive and aggressive behaviours towards themselves and others. The researcher is fully trained Applied Verbal Behaviour "AVB" therapist who is experienced to deal with such behaviours. The researcher is able to implement a teaching session to decrease such behaviours by using alternative tools to help the children to communicate their needs using either words, signs, Picture Exchange Communication System "PECS", or gestures instead of using disruptive/aggressive behaviours to communicate their needs. (Refer to the Methodology Chapter for more information).

As for the psychological issues, the researcher is fully aware that the participants of this study are children with autism and they are vulnerable group of people who find it very difficult to communicate with a strange person to them. Therefore, the researcher have used the positive pairing techniques as described earlier in this section, in order to establish positive rapport with the children and make the researcher presence as pleasant

as possible. The strategies/techniques of the Applied Verbal Behaviour "AVB" Programme which are based on the Applied Behaviour Analysis "ABA" application is widely recognized and used and they are not considered as experimental or harmful for the participants.

Before conducting any assessments or tests on the participants, the researcher consulted with the parents/teachers to make sure that the children are fine and there were no medical conditions that might affect the validity of the tests.

As for the fifth issue which is relating to power, the participants of this study are children with autism who are considered a vulnerable group of people. The researcher have positively paired herself with the children's parents/teachers and once the research will come to an end, she will gradually decrease her presence especially after establishing a positive rapport with the children and forming nice relationship with them. The teachers at the autistic centre are now fully trained by the researcher to carry out the implementation of an AVB programme and the researcher is still in constant contact with them.

As for the last issue which is regarding the fidelity in delivering the AVB Programme, the researcher was present on a daily basis in order to provide supervision and consultation for the teachers. Children's records were obtained from the Autistic Centre in order for the researcher to have access to the attendance registration as the absence of the children might affect their performance.

Ethical consent was granted in 2003 by the university ethical committee (Appendix M). The consent form was sent to all parents whom their children were participating in the study through the school (Appendix L). All 10 parents have signed the consent form and agreed for their children to participate in the research project.

3.1.9 Section 2: Design of the Research

This section will discuss the establishment of the Autistic Society, pre & post intervention assessment of the children, and data collection methods.

3.1.9.1 Planning the Research:

After establishing the Autistic Society by the researcher and a group of professionals (which they form the Board of trustees for The Autistic Society), a successful search for a regular school was started in order to implement the Applied Verbal Behaviour Programme in an attached unit. Throughout this thesis the attached unit will be referred to as "The Autistic Centre". The Society Board of Trustees has answered an advert in the newspaper for a regular school which was up to a free investment. The school was located in the suburb of Beirut for primary and intermediate students. The Board of Trustees has decided to invest in the school and use one of its section/floor as an attached unit for children with autism i.e. The Autistic Centre. The Society Board of Trustees has decided that implementing an AVB programme as the only stated educational strategies of provision at The Autistic Centre. The Society Board of Trustees was happy and welcomed the researcher to work with the staff in order to implement the programme.

Training was provided for both teachers and parents in the form of intensive courses within the actual classroom. The researcher had the chance to be present throughout the implementation of the AVB Programme in order to maintain and secure the application of the programme.

The participants are children with autism in a specialized centre which is attached to a mainstream school. Children are aged between 3 to 11 years old. (The children at this school have not been on AVB programme before). In the first year of the research there were only 3 children enrolled in this study. In the second year of this research another 7 children joined in, the total children involved in this study are 10 children.

There are two classes at the Autistic Centre. In each class there are five children, two qualified teachers with a university degrees and an assistant. Therefore the ratio is 3 teachers to 5 children.

3.1.9.2 Recruiting Staff

The Society Board of Trustees had placed adverts in various newspapers requiring educators in order to work with children with autism. The criteria for choosing a suitable person to work with children with autism:

- Holding a degree in education, psychology or any relevant field.

- Energetic and enthusiastic person.

- Must be willing to learn a new education method based on positive reinforcement.

- Enjoy children and willing to assist them in self-help skills.

- The ability to work within a team, where having an observant and thoughtful team member is very beneficial.

- Open minded, as having someone with previous training or set of ideas about how to teach children with autism, might interfere in the teaching process. For example spending more time arguing about how or what to teach instead of spending the time in teaching. Since working with children with autism is a group effort, every team member's observation and ideas are essential to the children's progress.

- Demonstrate reliability and dependability (showing up on time) and be excited about helping a child grow.

3.1.9.3 Recruiting Children and Parents:

The Society Board of Trustees had placed adverts in various newspapers, announcing the opening of The Autistic Centre which provides services for children with autism using the Applied Verbal Behaviour Programme.

The criteria for enrolling the children at The Autistic Centre:

- Must have the diagnosis of autism by independent licensed clinicians and assessed on 15 pre-treatment variables considered descriptive of autism i.e. Childhood Autism Rating Scales "CARS."

- Did not receive an AVB programme before.

- Parent involvement in the AVB programme

In order for the reader to have clear picture of the construction of this study, a table below

shows the research plan of the study

Research Plan

Month	Involved
August -September 2005	Initial assessment of the children and interviews for parents: CARS: Baseline Assessment of the children by the independent psychologist. Information on the participated children collected from parent using child's form questionnaires. BLAF: baseline assessment of the children by the researcher. Intensive training for staff in the use of ABA: AVB programme.
October 2005	The start of the school year. Assessment of the children using The ABLLS Parenting Stress Index Form filled by parent Positive Pairing Techniques (therapists and parents).
03-07 October 2005	Workshops for parents training them on the basic principles of AVB programme
October 2005 to June 2006	Implementation of the therapy: IEP for each child
December 2005 March 2006	Progress reports of the children (periodical).
End of June 2006	Assessment of the children using: BLAF The ABLLS Evaluation form by parents and teachers. Parenting Stress Index Form CARS assessment by the independent psychologist.

Figure (3.4) Research Plan

Analysing the information (using child's form questionnaires) collected from the parent of the participated children in this study on their children (See Chapter 4), it was noted that all the participated children in this study were not breastfed for longer period by their mothers and two of the children were born after fertility treatments. Surprisingly all the children have received their diagnosis of autism before the age of three by a recognized independent psychologist (this is unusual in a country like Lebanon). There was no history of autism in the children's family. The parents were highly educated with a university degree and came from a middle class background. Seven out of 10 parents think that the vaccine had badly affected their children. None of the children were taking any medication.

3.1.9.4 Training Staff and Parents

This section will discuss staff training courses and workshops which was run by the researcher and taught at the Autistic Centre. Training courses were provided by using the manual by Sundberg & Partington (1998). The duration of the first course was two weeks (45 hours), followed by monthly workshops and weekly meetings. However, the researcher was present on a daily basis and the teachers were able to seek her advice when needed. The researcher had trained the teachers on how to implement an AVB programme and how to design the IEP for each child using the ABLLS. The assessment and the IEP were done by the researcher and in consultation with the staff and parents. (For more information, refer to Chapter 4, training: teaching procedures of AVB). In

addition to the training, the performance of the staff in implementing the AVB

programme was evaluated by the researcher using the educational survey (Appendix CC).

Parents have received a five days workshop on how to work with their children using an

AVB programme, followed by periodical meetings and follow up consultation by the

researcher in order to enable the parents to facilitate generalisation and self-initiation of

skills. Parents have the opportunity to meet with other parents with children with autism

and to share experiences and information.

3.1.9.5 Implementation of the AVB Programme and Assessment

This section will discuss the implementation of an AVB Programme at the Autistic

Centre. It will discuss training staff and parents, the children's assessments, data

collection and data analysis. (For more information, refer to Chapter 4).

1. Childhood Autism Rating Scales "CARS"

All the children involved in the study were assessed prior to any intervention. All the

children were assessed by an independent psychologist using Childhood Autism Rating

Scales "CARS "(Eric Schopler, 1988), in order to measure the children's performance of

specific skills, and to minimize the risk of bias research, in addition, the use of "CARS"

for this research is to make sure that the opinion of the staff about the children's progress

is not influenced by the presence of the researcher. "CARS" help to identify children with

autism and determine symptoms severity through quantitative rating based on direct

observation. For this research CARS was conducted by an independent psychologist in

order to measure the children progress in different areas of functioning such as social interaction, verbal and non verbal communication, intellectual functioning etc... (See Appendix G) The highest the scores the children have the more severe type of autism they exhibit. A child who scores from 15 to 30 is considered non autistic, a child who scores between 31 and 38 is considered a child with mild to moderate autism, and a child who scores 39 to 60 is considered a child with severe autism.

a) The Reliability and Validity of CARS

From 1970 through 1980 the CARS was subjected to rigorous evaluation in order to determine its reliability and validity. Schopler, Reichler, and Renner rated 537 children with CARS and found an internal reliability coefficient of .94 and an interrater reliability coefficient of .71 for the diagnosis of autism. This form of CARS included (the 15 subscales) that is composed today.

In 1988, the validity and reliability of CARS was evaluated by Garfin, McCallon, and Cox with autistic children and adolescents. They compared the scores of 22 autistic children (6 -10 years old), 22 autistic adolescents (13-22 years old), and 20 non-autistic, handicapped adolescents. They found that CARS clearly discriminated between the two adolescent groups (non-autistic, handicapped vs. Autistic), although the total score did not discriminate younger from older. They also investigated specific items on CARS and recommended that one item be eliminated (inconsistencies in intelligence). They found that its eliminations would actually increase the reliability coefficient for both children and adolescent groups as it was negatively correlated with total CARS score. Limitations

of CARS that it was developed for a somewhat older sample and have been found to be over-inclusive when used with 2 years old and with non-verbal children with mental age under 18 months (Lord & Corsello, 2005).

b) Advantages of using CARS (Clinical Practice Guideline, Report of the Recommendations – Autism/Pervasive Developmental Disorders, (1999)

- The CARS may be useful as part of the assessment of children with possible autism in a variety of settings, such as early intervention programs, preschool developmental programs and developmental diagnostic centres.

- CARS provides a structured format for gathering and recording information/data.

- CARS gives a symptom severity rating, it may be useful for periodic monitoring of children with autism and for assessing long-term outcomes.

- Information from CARS could be useful for assessing functional outcomes especially if tied to other information about interventions and service delivery.

c) Limitations of Using CARS

- There is disadvantage of using CARS with younger children as there is limited research on its use in children under three years of age.

- CARS may not indentify some children with milder presentations of autism such as PDD/NOS.

- CARS may incorrectly identify autism in children with more severe mental retardation who do not have autism (Clinical Practise Guideline, 1999).

- One limitation of these data is that the students consisted of a classroom sample, rather than a population-based sample. The sample of this study was

predominantly upper middle class, which may limit the generalizability of observations. However, high socioeconomic status has generally been a strong predictor for good developmental outcome. (CDC, 2004).

Autism Spectrum Disorders (ASD) diagnosis in very young children may be delayed due to doubts about validity. In this study, by Kleinman, et al., which was published in the Journal of Autism and Development Disorder (2008), 77 children, received a diagnostic and developmental evaluation between 16 and 35 months and also between 42 and 82 months. Diagnoses based on clinical judgment, Childhood Autism Rating Scale, and the Autism Diagnostic Observation Schedule were stable over time. Diagnoses made using the Autism Diagnostic Interview were slightly less stable. According to clinical judgment, 15 children (19%) moved off the autism spectrum by the second evaluation; none moved onto the spectrum. Results indicate diagnostic stability at acceptable levels for diagnoses made at age 2 (Kleinman, et al., 2008). Movement off the spectrum may reflect true improvement based on maturation, intervention, or over-diagnosis at age 2.

1. Behavioural Language Assessment Form "The BLAF"

Initial data was taken on children to measure their performance using The Behavioural Language Assessment Form "The BLAF" (Partington and Sundberg, 1998) which is a simple scale used in an initial assessment with each child, in order to assess the children current functioning level (see Appendix H). The BLAF is an informant assessment that contains 12 sections that assess a variety of basic language- related skills (e.g. cooperation, motor imitation, labelling, and conversation). Each section is divided into

five levels (see Appendix H). Information obtained from The BLAF is typically used to identify the initial curricula areas of language intervention program (Miguel, Michael , 2002)

The Behavioural Language Assessment Form "The BLAF" is a quick assessment and it is an introductory to The ABLLS which is an intensive and more comprehensive assessment of the children's skills in order to identify strength and weakness of the required skills. The ABLLS provide IEP for each child in addition to skills tracking sheets. These assessments allow the teachers to update each child programme.

3. The Assessment of Basic Language and Learning Skills "The ABLLS"

The implementation of an AVB programme is comprehensive which covers many areas that the children need in order to function in a real world. The Assessment of Basic Language and Learning Skills "The ABLLS" (Partington and Sundberg, 1998) which is an assessment used by an AVB programme, The ABLLS is a criterion reference test which has been used to determine the children's skills in each of the 25 area of the assessment. The ABLLS has four sections, basic learner skills section, academic skills section, self-help section and motor skills section. (For more information about the content of each section refer to Appendix I).

The ABLLS is an educational tool used frequently with AVB model to measure the basic linguistic and functional skills of an individual with developmental delays or disabilities. Based on B.F. Skinner's book _Verbal Behavior_ (1957) which proposes that:

- language is a **<u>behavior</u>**

- language is influenced primarily through **<u>reinforcement</u>**

- and that establishing and maintaining the **<u>motivation</u>** to learn is critical for the acquisition of verbal behavior

The ABLLS was based on principles from B. F. Skinner's book Verbal Behaviour. Verbal behaviour states that language can be treated as behaviour like any other. Therefore, this behaviour can be broken down into smaller and smaller components, which can be used to track deficits and strengths in a child's language or social abilities.

The ABLLS was originally developed by Mark L. Sundberg, Ph.D., BCBA and published as the 1990 book "Teaching verbal behaviour to the developmentally disabled". The book was re-written with the help of James W. Partington, Ph.D., BCBA and published as the 1998 ABLLS. The ABLLS is published by Behaviour Analysts, Inc.

There is a detailed graphical checklist of several dozen categories of skills, arranged by typical order of developing. It is a useful guide to help determine what skills to work on next, and to check if any earlier skills were missed. Educators could fill the checklist to determine the child's competency in each skill category. For example, in the area of imitation, what types of imitation they can make. It requires several hours to do this assessment, especially for older children.

Purpose: The purpose of using the ABLLS is to help identify those language and other critical skills that are in need of intervention in order for a child to become more capable of learning from everyday experiences. In addition to identify other important areas including academic, self help, gross motor and fine motor skills.

Rationale: according to Partington and Sundberg manual (1998), parents and educators who live and work with a child with autism know that there are a variety of skills that each child must learn. Therefore, it is very important to know what a child can and cannot do in order to know which skills need to be addressed. Teaching few critical skills may result in a quicker acquisition of a larger set of skills without the need for a highly-specialized instruction.

Once the ABLLS is completed, it can show the level of development, and identifies possible gaps and weakness in the child's learning.

The ABLLS is most commonly used with children with developmental disabilities and delays (including <u>autism</u>); it can be also used for anyone who may be lacking in basic communication or life-skills.

It assesses the strengths and weaknesses of an individual in each of the 25 skill sets. Each skill set is broken down into multiple skills, ordered by typical development or complexity. So, a skill of F1 (Requests by indicating) is a simpler skill than F12

(Requesting Help). Usually, lower level skills are needed before proceeding to teach higher skills. However, many individuals display splinter skills that are above their practical level.

The ABLLS is conducted via observation of the child's behaviour in each skill area. The instructor will provide a stimulus to the child (Verbal, hand-over-hand, non-verbal, etc), and depending on what the child does (the behaviour) determines their skill-level.

The following is a very brief list of advantages and disadvantages to using the ABLLS assessment (Valentino, et al. 2007).

a) Advantages of using the ABLLS

- Provides a visual representation of skills.

- Can be conducted by most people with a minimal understanding of ABA/AVB.

- Addresses basic language, academic, self-help, classroom, and gross and fine motor skill sets.

- To help identify language and other critical skills in need of intervention necessary for a child to become more capable of learning from his everyday experiences

- To provide a method for identifying a child's specific skills in a variety of learning domains

- To provide a curriculum guide

- To provide a method for visually displaying the acquisition of new skills

b) Disadvantages of using the ABLLS (Valentino & Flake, 2007).

- Skill lists are not exhaustive

- Skills are mostly in order of childhood development, but every child learns differently.

- No age normalization is provided.

- Not a standardized assessment (it is still subjective to the assessor's interpretation or ability to elicit behaviours).

- Not all of the domains are based on scope and sequence progression

2. Parenting Stress Index "PSI" Short Form

Donenberg and Baker (1993) found that parents of children with externalizing behaviour experience as much stress as parents of children with autism (N=64). Both of these groups rate themselves as more stressed than the normal group. The stress was mostly child-related and affected almost all the subscales of the Child Domain (Parenting Stress Index, 1995). For this research and in order to measure parental stress level Parenting Stress Index "PSI Short Form" will be used from Psychological Assessment Resources Inc, (1995). (See Appendix K).

The PSI is suggested for use by clinicians and researchers who work with parents and children in a variety of settings. The primary categories of use of the PSI are: a) screening for early identifications, b) assessment for individual diagnosis, c) pre & post

measurement of intervention effectiveness, and d) research aimed at studying the effects

of stress on parent-child interactions and in relation to other psychological variables

(Abidin, 1995, p. iv).

The PSI was standardized for use with parents of children ranging in age from 1 month to

12 years. (Abidin, 1995). It has been also validated in a variety of transcultural research

involving population as diverse as Chinese (Pearson & Chan, 1993), Italian (Forgays,

1993), French Canadian (Brigas, et al., 1995). Portuguese (Santos, 1992), Latin American

Hispanic (Solis & Abidin, 1991).

a) The reliability and validity of the PSI/SF

The stability of the PSI is supported by the test-retest reliability coefficients obtained

from four different studies (Abidin, 1995; Burke, 1978; Zakreski, 1983; Hamilton, 1980)

correlation coefficients between the first and second set of scores indicated the stability

of scores across a 1- to 3- month interval.. In addition, Roggman, Moe, Hart, and Forthun

(1994) studies 103 Head Start Parents and reported PSI alpha reliabilities of .79 for PD

(Parent Distress), .80 for P-CDI (Parent Dysfunctional Interaction), .78 for DC (Difficult

Child), and .90 for Total Stress (Abidin, 1995) Recently, Chang and Fine (2007) report

PSI-SF coefficient alpha levels of o.79, 0.84 and 0.84 for the three subscales (PD, P-CDI,

DC). Considering additional PSI-SF psychometric qualities.

b) Strengths and limitations of using the PSI/Short Form

The PSI has a strong empirical and theoretical basis, was carefully developed and shows evidence of reliability and validity across many populations. The accompanying materials are extensive and facilitate administration, scoring and interpretation for both research and clinical use. The PSI-Short Form shows very strong initial psychometric properties. However there is not yet a large body of independent research to support its validity and utility for psychometric properties.

The Parenting Stress Index "PSI" Short Form was sent to parents and returned to the researcher through the school within one week.

3.1.9.6 Children's Assessment

All the children were assessed (using CARS The BLAF, The ABLLS, PSI Short Form,) these test were used in order as they were taken in time sequence, data was collected from gathering information from parents, and presenting specific task to each child and from observation. After analysing the test's result an IEP was designed for each one of the children. Teachers and parents have participated in designing the IEP. As discussed earlier "The ABLLS" is an assessment of language and learning skills and provides an IEP for each child based on his/her performance. All the children participated in the study apart from Alex were in need for attending skills and cooperation and reinforcers' effectiveness programmes. In order for a child to be able to communicate and learn, he needs to have basic leaner skills (section 1 in The ABLLS, Appendix I).

After designing and agreeing on the child's IEP, the programme that the child needs to work on was put on the all programmes sheet from the day s/he started the programme to the day s/he mastered it. (Please see Appendix N).

The children's reviews occurred at regular intervals (daily, weekly, periodically and annually). The reader is reminded that "The Autistic Centre" is a day unit which is attached to a regular school. Each child has an annual review. In addition, children's progress was monitored on a daily basis. Weekly and periodical assessments were sent to the parents via the communication book and reports, in order to report progress of their children. Final assessments of all the children were conducted separately for each child except where group instruction work was assessed, the assessment is videotaped and parent are invited to watch it after sending them the final report and assessment of their children.

There is a communication book between teachers and parents where both can write their observation and comments regarding a child. The teachers write on the communication book every Friday (last day of the week at The Autistic Centre" to give a summary of the child's behaviour, achievement and any noticeable observation. In addition, the teachers write to parents on any other day than Friday if there was any inappropriate behaviour or an outstanding achievement which had occurred during this particular day. In return the parents write to inform the teachers on their child's behaviour and performance at home and if they want to express their concerns regarding their child etc… The comments of the parents were very positive regarding their child's performance.

The parents were sent the Parenting Stress Index "PSI" Short Form, and they have sent it back within one week.

3.1.9.7 Data Collections

Regarding the data collection methods, The Society Board of Trustees has embraced the use of the ABLLS in order to measure the progress or lack of progress in their children. The teacher's evaluation may be considered by some to be subjective. Therefore, the children were videotaped during assessment and learning sessions in order for the tests to be more reliable and not by any chance biased.

To measure children's progress the tests or assessment should be auditable, tangible, independent and replicable. See for example (Hargreaves, 1967; Fullan and Stigelbauer, 1991; Fidler and Atton, 1999).

- **Auditable:** The ABLLS, BLAF are reference criterion tests, CARS and PSI are standardized tests and assessment. The data was gathered and collected from weekly visit to the school during the implementation of the AVB programme. This data was open to all at the school. Therefore, the data collected was done in an open way in full view of the staff, and the parent's participants. In addition, progress reports of all the children were presented to "The Board of Trustees" at The Autistic Centre".

- **Tangible:** The ABLLS, BLAF, CARS and PSI have test scores. The data generated was a faithful collection of observing tests conduction, and analysing tests results. The above tests were conducted by the teachers and observed by the researcher, the independent psychologist, and the parents have filled the PSI Short Form and later the forms were analysed by the researcher.

- **Independent:** Although, the researcher is member of The Society Board of Trustees, she did not get paid for the work she did at the centre. The researcher's role was to train, support the staff and parents to implement an AVB programme and to observe the implementation process and outcome. To minimize the risk of bias research, all the children were also assessed by an independent agency (psychologists) using "CARS" in order to minimize the issue of bias and to make sure that the opinion of the staff/parents of the children's progress is not influenced by the presence of the researcher.

- **Replicable:** As for the implementation of an AVB programme at the Autistic Centre, it would be possible to replicate similar results if the same implementation procedures are employed on similar participants.

The academic year at the Autistic Centre starts in October and ends in June each year. Work with the children began in October 2004 and finished in June 2005 and started again in October 2005 and ended in June 2006. The reason for doing the research over two academic years because of the sample size in the first year was only 3 children (Alex, Karl, and Zack). In the second academic year a total number of 10 children have participated in the study. There were two classes at the Autistic Centre with 5 children in

each class. There were 2 teachers and 1 assistant in each class. All the teachers have a recognized university degree (special education, Nursery and primary teacher, psychology and social sciences.)

This section will describe the methods used to collect data on the children's programme. The reader is reminded that all tests and assessment were done pre & post AVB intervention. Data collections involve the following tests and assessments:

- Parenting Stress Index Short Form "PSI".
- Childhood Autism Rating Scales "CARS" by an independent agency (psychologist).
- The Behavioural Language Assessment Form "The BLAF".
- The Assessment of Basic Language and Learning Skills "The ABLLS".
- Questionnaire/Evaluation Form by Teachers.
- Questionnaire/Evaluation Form by parents

The researcher has used The ABLLS and the BLAF (assessments were conducted by the children's teachers and observed by the researcher) in order to measure the children's progress in the area of Basic learner Skills, Academic skills, Self- Help skills and Motor Skills. In order to validate the children's outcomes, the researcher have developed the evaluation form questionnaire which has to be filled by parents and teachers and allow them to report their children's progress or lack of progress, the reason for this evaluation

questionnaire for both parents and teachers was in order to see if they both have noticed any improvement in their children which can be related or attributed to the AVB intervention. In addition, the children were assessed using CARS, one year before starting the intervention by an independent psychologist and they were assessed again at the beginning and at the end of the AVB intervention. As children with autism exhibit some behavioural difficulties which will affect the relationship between them and their parents and make it difficult to communicate, a Parenting Stress Index was filled by the parent at end of the intervention to measure their stress level and compare it to the pre-interventions scores.

The data was collected (The ABLLS) by direct observations on a daily, weekly and periodically basis by the researcher and by having access to the children records such as daily (see Appendix O), weekly: (written notes on the communication book), periodically: (see a sample in Appendix P) and annually (see a sample in Appendix Q). The reader is reminded that the teachers worked with the children while the researcher was collecting the data. In addition, the researcher has reviewed the formal notes (histories, specialist and formal reports on children), teachers and parents evaluation of the children's progress was done through an original questionnaires designed by the researcher in order to minimize the risk of bias research and allow all parties involved to measure the children's progress and report on their performances.

Daily contact by the researcher with the teachers led to an intimate relationship which as a result, established very good rapport between the researcher and the teachers and made

the class-room more comfortable environment to work in. "The Board of Trustees" at "The Autistic Centre" asked the researcher to be present at the centre on a daily basis (at least two hours a day) in order to insure proper implementation of the AVB programme and to offer help and advice to teachers when needed.

To obtain accurate results, (all the children have received a baseline assessment by an independent psychologist, the independent psychologist has used Childhood Autism Rating Scales "CARS" (see Appendix G).

1. Initial Assessment: The Behavioural Language Assessment Form "The BLAF"

This is a simple scale which was designed by Partington & Sundberg (1998).

The BLAF was used in an initial meeting with each child, in order to assess the children current functioning level. (see Appendix H)

2. ABLLS: Assessment of Basic Language and Learning Skills:

The ABLLS is an assessment, curriculum guide and skills tracking system for children with language delays. The ABLLS was designed by Partington & Sundberg (1998). It contains a task analysis of the many skills necessary to communicate successfully and to learn from everyday experiences.

Information to complete ABLLS has been obtained from three sources:

1. The parents, educators and others who regularly interact with the child.

2. Information was gathered from observation of the child in particular situations.

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3. Information has been obtained from formal presentation of tasks to the child in order to determine the child's competency of specific skills.

A description of the children's skills will be presented (see Appendix R, diagrams for the results of their performance presented on the skills tracking grids for each of the skill areas), followed by an analysis of those skills to determine the priorities for their educational programmes. Additionally, a review of the rationale for the selection of recommended specific learning objectives for the children are usually provided.

Although there is many other assessments that address many of the areas covered in The ABLLS, the ABLLS has special features, which makes it more appropriate to use for this type of study. The ABLLS has been designed to assess a variety of language skills, in addition, to account for a child's motivation to respond, his ability to attend to a different environmental stimuli (verbal and non verbal), his/her ability to generalize skills, and his/her tendency to spontaneously use those skills.

These features are described as follow:

Language: Skinner's (1957) analysis of verbal behaviour serves as the conceptual basis for the current language – based skill assessment. It is a functional analysis of language in that it primarily focused on the different environmental (i.e., pragmatic) condition in which language occurs. As a result of this approach, Skinner has identified many types of expressive language where children with autism have language deficits of expressive language The ABLLS is a tool to identify the language deficits that children with autism have, as well as to highlight the areas that in need of intervention.

Motivation: Many of the assessment items/tasks in the ABLLS are designed to help identify the child's skills under a variety of motivational conditions. Therefore, it will help to provide an analysis of the motivational condition that may affect a child with autism. For example, a child with autism might only demonstrate certain skills when either "naturally occurring motivational situations" are captured or when certain motivational situations are contrived (Partington and Sundberg, 1998).

Complex Stimuli: The ABLLS assesses the child's ability to attend to a variety of combined stimuli because so many elements of language in the NET (Natural Environment Training) involve complex stimulus conditions. For example a child with autism has difficulty attending to certain combinations of stimuli (e.g. a task involving a combination of both verbal and visual stimuli).

Generalisation: The ABLLS assess the child's ability to generalize skills to new situations. As most children can learn specific skills, children with autism may not generalize those skills in different setting, at different times, with different people and in different verbal instructions.

Spontaneity: The ABLLS assesses the child's ability to use the language spontaneously without any prompts/helps.

Skills Tracking System: The ABLLS provides us with the initial assessment of the children's skills and also allows for reviews and updates of the children's progress. After the initial assessment the result will be displayed on the skills tracking systems display grids which show the level at which the child is performing a specific skill (see Appendix R). In addition skill deficits are clearly identified which make The ABLLS a tool to highlight an intervention targets.

As the children's assessment is updated, the progress and the gains of many new acquired skills are filled in the additional boxes.

The teachers had worked with the children on one-to-one basis in order to assess each child individually, while they have videotaped and the researcher was present all the time to collect data on the skill tracking sheets and the teachers were able to cross check the data once it has been processed on the computer.

Despite the mentioned advantages of using "The ABLLS" Partington and Sundberg (the designers of the ABLLS) have recognized the limitation of using it as "The ABLLS" is not designed to provide age norms.

3. The Parenting Stress Index "PSI"

The Parenting Stress Index Short Form "PSI" was used in order to answer the second aim of this study. PSI is questionnaire and a standardized assessment (psychological Assessment Resources "PAR", 1995). This questionnaire contains 36 statements where the respondent can circle choices of closed typed answers of Strongly Agree, Agree, Not Sure, Disagree, and Strongly Disagree (See chapter 5 or Appendix K).

4. Type of questionnaire: Evaluations of an AVB programme form by parents and teachers.

In order to answer the research questions a semi-structured questionnaire was developed by the researcher with fixed alternative questions and open-ended ones where the respondent has the ability to express him/herself. The teachers and the parents had filled this form twice (pre & post AVB Intervention), in order to investigate the effects of implementing an AVB programme on children with autism.

Van Dlen (1979) advises that "presenting respondents with carefully selected and ordered questions is the only practical way to obtain data" (p.152)

The use of questionnaires to evaluate the children's progress and performance by both their parents and teachers has got its advantages:

- It can be completed at the leisure of the respondents i.e. teachers and parents.
- It is very useful method for the researcher and very easy to complete for the respondents in a time and place that suits them (Oppenheim, 1992; Bryman, 2001).

The closed type questions were used in order to collect quantitative data for sufficient efficiency and accuracy. As (Bong and Gall, 1983, p.419) suggest that "Generally though it is desirable to design the questions in closed form so that quantification and analysis of the results may be carried out efficiently".

The included questions in both questionnaires were designed in a variety of ways as described in the table below:

Description	Type of questions
Choice of predetermined possible answers	1. Multiple choices questions
Suggestion of categories of responses.	2. Closed questions
Answer with Yes or No	3. Dichotomous questions
Provide intervals of a value in order to collect opinions.	4. Scaled questions
The respondent can express themselves freely.	5. Open questions

Figure (3.5) Type of questions

The questionnaire is divided into different sections (See Appendix J). Section 1 titled Personal Details involves questions regarding child's diagnosis and the severity of the child disability.

Section 2 titled Behaviour which poses questions on the child's behaviours. It is divided into 8 questions which collect information regarding the child's self-injurious/ aggressive behaviour and self-stimulatory behaviours: the occurrence of the behaviour when excited, when frustrated, when under-stimulated, rarely or other; how many times does the behaviours occur ; changes of behaviour after therapy.

Section 3 titled Progress and Development it is divided into 19 questions in order to highlight any changes contributed to the implementation of an AVB programme. It involves ticking boxes for regression, no changes, significant improvement or N/A for the following areas: Behavioural 12 items; compliance 12 items; waiting 4 items; performing skills in different situation 4 items; receptive language 5 items; communication repertoire: expressive behaviour 10 items, expressive behaviour 19 items; social Intraverbals 4 items; non verbal imitation 4 items; matching and sorting 9 items; play skills 8 items; Object labelling 3 items; verbal imitation 4 items; abstract concept 4 items; sentence structure 3 items; academic works10 items; social repertoire 6 items; self help skills 20 items.

Section 4 is titled personal view and is divided into 14 questions which has open ended questions about the goals prior starting the AVB programme; list of changes; reaching the goals; any surprises during the programme; disadvantages of the programme; adequate support during the implementation of the programme; do they recommend it to others and why; the cooperation of the child with others. The last question is about their experience of implementation an AVB on their child.

3.1.9.8 Data Analysis:

Children in both classes were assessed at intake and at different stages. Assessment occurred in the areas of academic functioning, language functioning and adaptive functioning. Each child's educational programme was based upon an individual assessment of communication and academic skills and functional behaviour assessment

for behaviours that may interfere with learning other skills. (i.e. aggression, self stimulation, and self injurious behaviours). In addition parents and teachers were interviewed as part of the study.

a) Coding

Coding is analysis. Codes are tags or labels that assign units of meaning to the descriptive or inferential information compiled during the study (Miles & Huberman, 1994). In addition, they are used as means in order to organise and retrieve chunks of data and to categorise, cluster and display the data. Theoretical, systematic coding procedures support and facilitate the management and manipulation in the interaction with the data.

The primary task of data reduction is coding, that is assigning a code number to each answer to a survey questions. However, many open-ended questions are not coded in this way for computer analysis.

Pre-coding was used for closed-ended questions as Cohen (2000) suggests (see Appendix S). Coding for open-ended questions was done after completion of the questionnaires because of the small sample of the participants of this study; all respondents' answers were included.

Microsoft Office Excel 2003 was used as a computer package which assisted the researcher in designing and administrating and processing of the quantitative data. Responses were entered rapidly and cross checked by respondents. Data were checked and graphics and table were produced (Cohen, et. al, 2000).

Sudman and Bradburn (1982:149) suggest that coding is preferable by respondents themselves in order to insure validity. Parents and teachers welcomed the idea of cross checking of their answers but did not want to be involved in the coding process. However, only 2 teachers have accepted the offer to become involved in the coding processing of questions.

b) Processing Data's Questionnaire

After receiving the questionnaires by parents and teachers, the questionnaires had to be checked for editing "editing questionnaires is intended to identify and eliminate errors made by respondents". (Cohen et al, p.265).

Three central tasks in editing are provided out by Mosen and Kalton (1977):

1. Completeness: Completeness is a check that is made to make sure there is an answer to every question. Missing questions can be crossed checked and respondent can be contacted agreeing to supply the missing information. The researcher had contacted the parents or the teachers in order to supply her with the missing answers.

2. Accuracy: Accuracy is a check that is made to make sure all questions are answered accordingly. No confused answers by ticking two boxes instead of one. Respondents will be contacted to supply one answer.

3. Uniformity: Check of uniformity to eradicate a source of errors by the respondents.

The respondents had the chance to cross check their responses by themselves.

c) Coding the closed-ended questions (questionnaire for parents and teachers):

Coding the closed-ended questions of the semi-structured questionnaire was a straightforward – *a priori* process, as the categories had already been planned before the distribution of the research instrument and thus, numeric values were given to all variables.

Pre-coding was proved very helpful because as soon as the questionnaires were received the data were entered straight into the Microsoft Office Excel 2003, the researcher tried to avoid piling the questionnaires and to ensure that she put the same code to the same value. The only care was to ensure that codes have been entered accurately. For that reason the researcher re-entered the data in the software package.

d) The open-ended questions (questionnaire for parents and teachers):

Regarding the open-ended questions, a *posteriori* coding was opted for, as they involved qualitative information, since the respondents' opinions cannot be predicted. First of all, the researcher made a file in her computer with all open-ended questions and all the answers provided by the parents and teachers. This technique was helpful, because it was easily accessible and the researcher was able to see what information each question gathered and what every respondent had said for every question. She then highlighted similar words with the same colour using the highlight facility on the computer. Then the researcher printed the open-ended questions and their responses in order to turn them into a document, the highlighted coloured words made it easy to find manually the frequencies of words using the content analysis technique discussed above. Counting the similar patterns of words into groups helped the researcher to form the categories of each open –ended question. She did read and re-read the open-ended questions many times so as to be sure that each word fits in the appropriate category.

Thus, a list of categories was developed and condensed into mutually exclusive groups. The categories were ranked; this is ordered- based on the total number of responses in each. The researcher was coding for *frequency* and not for *existence* (predetermined conceptions). The researcher decided to code not only for a single word but also phrases provided which were carrying the same meaning to certain categories (level of analysis). Careful attention was paid to ensure that a range of views and variables are included, avoiding the loss of data (Bailey, 1997).

e) Tests

According to Cohen (2000, p.317) tests are powerful methods of data collection "an impressive array of tests for gathering data of a numerical rather than verbal kind".

There are commercially produced tests which cover vast range of topics which can be used for evaluation purposes.

Most schools will have used published test at one time or another (Ibid, p.319) for diagnostic tests, achievement tests, skills tests, reading tests, verbal and non verbal reasoning, test of intelligence and social adjustments etc…

The use of published test is preferable because of the following reasons (Cohen, et al, 2000):

- Objective.

- Piloted and refined.

- Validated

- Tends to be parametric tests.

- They come complete with instructions.

- Guides to the interpretation of the data are usually included in the manual.

- Time saving for the researcher instead of having to devise pilot and refine their own test.

The ABLLS and BLAF are criterion reference assessments, PSI and C.A.R.S are standardised tests. The tests and assessments used in the present study were appropriate to use for the following reasons: The ABLLS and The BLAF are designed for the use of an AVB programme which serves as an assessment and curriculum guide for each child. Whoever administers the test needs to be trained in the use of this kind of tests; the researcher is fully trained and had over 10 years of experience in implementing and administering these types of tests. As Cohen (2000) suggests that "The golden rule for deciding the use of a published test is that it must demonstrate fitness for purpose". The researcher demonstrated earlier the reasons as why these types of tests were used for this study because of the language, motivation, generalisation, spontaneity and skills tracking system (Refer to section: Reasons for using The ABLSS). The Parenting Stress Index PSI was appropriate to use this type of test in order to measure the Parental Stress level in an easy to follow instructions for the respondents and have user friendly instructions for data collection and data analysis. As for the C.A.R.S it was used by an independent psychologist in order to minimize the risk of bias research. During the conducting and the administrations of all the above tests and assessments which have been used for this research, the assessor actually maintained the integrity of the assessment which was provided and lay out in the manual at all the time.

Summary

This chapter has outlined the adopted methodological principles for the research project, the methods and the tools of data collection and the rational for their selection, the intervention study and the ethics of the research together with presentation of the employed instruments for managing the coding and the analysis of the data. The following chapter will discuss the curriculum strategies, individual assessment and programme delivery.

Chapter 4- The implementation of Applied Verbal Behaviour "AVB" Programme

The aim of this chapter is to look in depth at the implementation of the AVB Programme at The Autistic Centre which involves a number of factors; the criteria for choosing the sample for this study, the children's assessment, teaching procedures of the AVB Programme, the design and planning of the AVB programme and finally, it will discuss the data recording procedures.

The purpose of the research is to study the effects of implementing the AVB programme on children diagnosed with autism in the areas of academic, language, and adaptive functioning. The Intervention is to work to support parents, work to train key workers, work on children in accordance with the principles designs of the AVB programme.

4.1 Recruiting Children

The society Board of Trustees placed adverts in various newspapers, announcing the opening of the Autistic Centre which provides services for children with autism using the Applied Verbal Behaviour Programme "AVB". Parents have answered the adverts and they attended "The Autistic Centre" for an interview. The children who met the criteria for the proposed research were enrolled in this study. All the enrolled children had the diagnosis of autism and they did not receive an "AVB" programme before.

4.1.1 Criteria for Choosing the Sample:

The researcher has chosen the autistic centre for this study because of the following reasons:

- All children who participated in this study have the diagnosis of autism.

- The Centre Board of Trustees accepted to fully implement the AVB programme without any modification.

- Teachers and parents were trained to carry out the procedures at school and at home.

- Children were assessed by an independent psychologist before The Applied Verbal Behaviour "AVB" Intervention and after, using Childhood Autism Rating Scales C.A.R.S.

- Children did not receive the AVB programme previously.

- Children's age was varied from 3 to 9 years old.

- Parents accepted to participate fully in the research and measure their stress levels before and after the implementation of the AVB programme.

Other centres did not want to fully implement the AVB programme at their school and they did not allow the researcher to interview and involve parents in the study. They did not want their teachers to receive ongoing training and supervising. The Autistic Centre has met the research criteria by allowing the researcher to fully implement the AVB programme, and have ongoing training and supervising for the teachers, in addition to the involvement of the parents.

All the enrolled children in The Autistic Centre have met the criteria to participate in this study. In addition the researcher did assess the children using the following assessments (More details in the methodology chapter):

- The Behavioural Language Assessment Form (The BLAF).

- The Assessment of Basic Language and Learning Skills (The ABLLS).

The use of The BLAF is to determine which level is most accurately will describe the child's current abilities. The BLAF is not supposed to be a complete assessment of verbal skills; it is rather an initial assessment or a brief overview of those skills. For more complete and advanced assessment of the child's skills the researcher also uses The ABLLS.

The result of the initial assessment will help to determine which particular part of the training programme is most relevant for the child's needs. The intervention begins with procedures for teaching basic communication skills, and later on progress to more complex language skills.

4.1.2 Sample

There were two classes at the Autistic Centre, five children in each class, which made up the sample for this study. All ten children have the diagnosis of autism. The following is a brief summary of the children's Form (see Appendix T):

1. Alex was a 9 year old boy (at intake), diagnosed with autism with a moderate level of disability, Alex has one sibling, and she is 2 years older than him. Alex's parents are both highly educated with postgraduate degrees. There is a history of Attention Deficit Hyperactive Disorder ADHD in Alex's family. As for his behaviour, Alex had some self-stimulatory behaviour such as swirling ropes. As for his medical history, Alex had digestive disorders, severe ear infections, and asthma and milk allergy. Alex's parents strongly believe that the vaccine had affected their son. As for his health, Alex was breastfed for 3 weeks only when his mother had severe infections and she was hospitalised. His parents put him on a gluten and casein free diet and he has been taking dietary supplements and vitamins since he was 2 years old. According to Alex's parents his digestive system had improved. Alex is a left handed child. As for his language, Alex has 2 words sentence and he had acquired some spontaneous requests (mands), some labels (Tacts) and some limited (Intraverbals). His language skills were characterized as being moderately to severely delayed. As for his development history, Alex had met all his mile stones at the appropriate age of 18 months and then he started regressing and used less language, social interaction and communication. Alex is toilet trained but he needs some assistance in the process of cleaning himself. Alex had received psycho-motor and speech therapy since the age of two.

2. Karl was a 3 year old boy (at intake) diagnosed with autism with a moderate to severe level of disability. Karl was not conceived naturally his parents had

to use fertility treatments. Karl has one sibling, and she is his twin and she is typically developing child. Karl's parents are both highly educated with a university degrees. There is history of mental retardation and speech delay in Karl's family. As for his behaviour, Karl had self- injurious and aggressive behaviours such as biting his hand; this behaviour was severe to the point that they caused physical damaged. He displayed aggressive behaviour towards others by biting and pinching them. Karl also engaged in self-stimulatory behaviours such as flapping hands, feet and smelling food constantly. As for his medical history, Karl was born one month prematurely. As for his health, Karl was breastfed for one month only and there was no history of childhood illness. As for his diet, he had an excess of dairy and wheat products, fruits and meats. As for his language, Karl is a non verbal child, he communicate and requests his needs by crying. He has irregular sleeping patterns and stays awake for 2-3 hours in the middle of the night. His language skills were characterized as being severely delayed. As for his development history, Karl walked at the age of 17 months; he has gross and fine motor difficulties. Karl is not toilet trained yet. Karl had received psycho-motor and speech therapy since the age of two.

3. Zack was an 8 year old boy (at intake) diagnosed with autism with a severe level of disability. Zack has one sibling, Zack's brother is a few years older than him and he is typically developing child. Zack's parents are both highly educated with a university degrees. There is history of mental retardation and speech delay in Zack's family. As for his behaviour, Zack had displayed

aggressive behaviour towards others such as biting, kicking, hitting and pinching them. Zack had also engaged in self-stimulatory behaviours such as flapping his hands, feet and swirling objects. As for his medical history, Zack had severe digestive disorders. Zack's parents strongly believe that the vaccine had affected their son. As for his health, Zack was breastfed for three months only and he had frequent ear infections. As for his diet, he is on gluten, casein and yeast free diet. As for his language, Zack is a non verbal child; he requests his needs by snatching things or sometimes uses any sign to get a specific item. He has some few night frights. His language skills were characterized as being severely delayed. As for his development history, Zack walked at the age of 13 months, he has fine and gross motor difficulties. Zack is partially toilet trained. He has received psycho-motor and speech therapy since the age of three.

4. Andre was a 6 year old boy (at intake) diagnosed with autism with a severe level of disability, Andre has two siblings, Andre's brothers are a few years younger than him, and they are typically developing children. Andre's parents are both highly educated with university degrees. There is no history of mental retardation or speech delay in Andre's family. As for his behaviour, Andre engaged in self-stimulatory behaviours such as mouthing, biting, spinning and swirling objects. As for his medical history, Andre did not suffer of childhood illnesses. As for his health, Andre was breastfed for six months. As for his diet, he has excessive meats, sugar, artificial sweeteners, and dairy and wheat products. As for his language, Andre is a non verbal child; he

requests his needs by crying, or rarely by pulling hands and leading adults to the desired items. He has irregular sleeping patterns and he stays awake for 2-3 hours in the middle of the night. His language skills were characterized as being severely delayed. As for his development history, Andre walked at the age of 24 months and he has fine and gross motor difficulties. Andre is not toilet trained. Andre had received psycho-motor and speech therapy since the age of two.

5. Patrick was a 3 year old boy (at intake) diagnosed with autism with a moderate to severe level of disability. Patrick was conceived after fertility treatments. Patrick has one sibling, Patrick's brother is a few years older than him, and he is typically developing child. Patrick's parents are both highly educated with university degrees. There is no history of mental retardation or speech delay in Patrick's family. As for his behaviour, Patrick engaged in self-stimulatory behaviours such as hand mannerism, vocal stim, spinning and swirling objects. As for his medical history, Patrick did not suffer of childhood illnesses. As for his health, Patrick was breastfed for two months. As for his diet, he has eating disorders and can only eat baby pureed food. He has an excess consumption of milk. As for his language, Patrick is a non verbal child, he requests his needs by crying and his parents had to guess what he really wants. He has irregular sleeping patterns and stays awake for 2-3 hours in the middle of the night. His language skills were characterized as being severely delayed. As for his development history, Patrick walked at the age of 20 months and he has fine and gross motor difficulties. Patrick is not

toilet trained. Patrick had received psycho-motor and speech therapy since the age of two.

6. Sarah was a 4 year old girl (at intake) diagnosed with autism with a moderate level of disability. Sarah has one sibling, Sarah's brother is a few years older than her, and he is a typically developing child. Sarah's parents are both highly educated with postgraduate degrees. There is no history of mental retardation or speech delay in Sarah's family. As for her behaviour, Sarah engaged in self-stimulatory behaviours such as hand mannerism, vocal stim, rocking and mouthing objects. As for her medical history, Sarah had some frequent ear infections. Sarah's parents strongly believe that the vaccine had affected their daughter. As for her health, Sarah was breastfed for six months. As for her diet, she is a picky eater. She has an excess consumption of sugar, milk and wheat products. As for her language; Sarah is a non verbal child with a limited use of occasional words. She requests her needs by crying or sometimes by pulling her parents hands and leading them to the desired items. Her language skills were characterized as being severely delayed. As for her development history, Sarah walked at the age of 18 months and she has some fine and gross motor difficulties. She was not toilet trained. Sarah had received psycho-motor and speech therapy since the age of two.

7. Jad was a 6 year old boy (at intake) diagnosed with autism with a moderate to severe level of disability, Jad has no sibling. Jad's parents are divorced and Jad lives with his father. Jad's mother is educated with a university degree while his father is not. There no is history of mental retardation and speech

delay in Jad's family. As for his behaviour, Jad had displayed aggressive behaviour towards others such as biting, kicking, hitting and pinching them. Jad had also engaged in self-stimulatory behaviours such as flapping hands, feet, mouthing, smelling and swirling objects. As for his medical history, Jad had no serious childhood illnesses. Jad's parents strongly believe that the vaccine had affected their son. As for his health, Jad was not breastfed at all. As for his diet, he has an excess of milk, wheat, and sugar products. As for his language, Jad is a verbal child who uses 2 words; he requests his needs by snatching things or sometimes uses single words to get a specific item. He has some irregular sleeping patterns. His language skills were characterized as being moderately to severely delayed. As for his development history, Jad walked at the age of 15 months, and he has some fine and gross motor difficulties. Jad was toilet trained at the age of 4 years. He had received psycho-motor and speech therapy since the age of three.

8. Isaac was a 6 year old boy (at intake) diagnosed with autism with a severe level of disability. Isaac has one sibling, his brother is a few years older than him, and he is a typically developing child. Isaac's parents are both highly educated with university degrees. There is no history of mental retardation or speech delay in Isaac's family. As for his behaviour, Isaac engaged in self-stimulatory behaviours such as mouthing, spinning and swirling objects. As for his medical history, Isaac did not suffer any of the childhood illnesses. Isaac's parents strongly believe that the vaccine had affected their son. As for his health, Isaac was breastfed for three months. As for his diet, he has an

excess of processed meats, sugar, artificial sweeteners, and dairy and wheat products. As for his language, Isaac is a non verbal child, he request his needs by crying or rarely by pulling hands and leading adults to the desired items. He has irregular sleeping patterns and he stays awake for 2-3 hours in the middle of the night. His language skills were characterized as being severely delayed. As for his development history, Isaac walked at the age of 14 months and he has fine and gross motor difficulties. Isaac is not toilet trained. Isaac had received psycho-motor and speech therapy since the age of two.

9. Mustapha was a 4 year old boy (at intake) diagnosed with autism with a moderate level of disability, Mustapha has one sibling, his brother is a year younger than him, and he is a typically developing child. Mustapha's parents are both educated with International Baccalaureate Certificate (Equivalent to A levels). There is history of Attention Deficit Hyperactive Disorder "ADHD" and speech delay in Mustapha's family. As for his behaviour, Mustapha engaged in self-stimulatory behaviours such as mouthing, spinning and swirling objects. As for his medical history, Mustapha did not suffer any of the childhood illnesses. Mustapha's parents strongly believe that the vaccine had affected their son. As for his health, Mustapha was breastfed for only three months. As for his diet, he has an excess of meats, sugar, artificial sweeteners, dairy and wheat products. As for his language, Mustapha is a verbal child who uses one to two word sentences; he requests his needs by sometimes using single words or crying. His language skills were characterized as being moderately to severely delayed. As for his development

history, Mustapha walked at the age of 11 months and he had some fine and gross motor difficulties. Mustapha is not toilet trained. Mustapha had received psycho-motor and speech therapy since the age of two.

10. Hassan was a 3 year old boy (at intake) diagnosed with autism with a moderate level of disability, Hassan has two siblings, His sister is a few years older than him while his brother is younger than him, and they are typically developing children. Hassan's parents are both highly educated with university degrees. There is a history of mental retardation and speech delay in Hassan's family. As for his behaviour, Hassan engaged in self-stimulatory behaviours such smelling food and objects, tearing up tissues and taking his clothes off. As for his medical history, Hassan did not suffer any of the childhood illnesses. Hassan's parents strongly believe that the vaccine had affected their son. As for his health, Hassan was not breastfed. As for his diet, he has an excess of sugar, artificial sweeteners, dairy and wheat products. As for his language, Hassan is a verbal child (uses 1 single word); however, he requests his needs by crying or sometimes by pulling hands and leading adults to the desired items. His language skills were characterized as being severely delayed. As for his development history, Hassan walked at the age of 12months and he had some fine and gross motor difficulties. Hassan is not toilet trained. Hassan had received psycho-motor and speech therapy since the age of two.

4.2 Assessment

Assessment of the children was conducted pre and post AVB intervention. This section involves the following issues: Establishing rapport, preliminary assessment, full assessment and IEP, teaching using AVB, periodical assessment and final assessment.

4.2.1 Establishing Rapport: Positive Pairing Technique

The positive pairing technique was used (before conducting any assessment of the children's skills by the researcher), in order to establish rapport between the children and the researcher, as it is critical to begin and to develop the therapeutic relationship very carefully. It is very important that the child continues to enjoy being with the researcher or teachers and sees learning as a good thing and has value for the child. In behavioural terms, the researcher had to "pair-herself with reinforcers". This was accomplished by the researcher carefully observing the child and interacting with him/her in a way s/he finds it enjoyable (observing how the child likes to be touched, what kinds of voices s/he enjoys, what toys s/he prefers to play with, what kinds of food s/he likes etc…). The researcher approached the child when s/he appears bored and unconditionally offered him/her something s/he enjoys (Primary Reinforcer). She played with him/her without requiring any responding. For the researcher to be established as a form of "Conditioned Reinforcer" for the child (a stimulus that has earned its reinforcing properties through association with a primary reinforcer), the researcher had a special food or toy that was only available when she was present.

The purpose of the assessment should determine what particular part of a child's verbal behaviour is weak and where to begin the language instruction. Therefore, and in order to establish a reasonable degree of rapport with the child, the researcher positively paired herself with the child's reinforcers.

Before implementing the programme at The Autistic Centre, the teachers and the parents have received an intensive and on-going training in the use of The Applied Verbal Behaviour "AVB" Programme using the manual by Sundberg & Partington, (1998).

4.2.2 Preliminary Assessment

All the enrolled children in this study were assessed prior to the AVB intervention. Initial data was taken on children to measure their performance using The Behavioural Language Assessment Form "The BLAF" which is a simple scale that is used in order to assess the children current functioning level in the areas of academic, adaptive, language, and academic skills. Samples of preliminary assessment using "The BLAF" (see Appendix BB)

4.2.3 Full Assessment and IEP

The implementation of the AVB programme is a comprehensive one which covers many areas that the children need in order to function in a real world. The Assessment of Basic Language and Leaning Skills "The ABLLS" is an assessment, curriculum guide and skills tracking system for children with language delays. The ABLLS is an assessment used by the AVB programme which was used for this study in order to determine the

children's skills in each of the 25 area of the assessment. The ABLLS has four sections. Basic learner skills section, academic skills section, self-help section and motor skills section. For more information about the content of each section refer to the Methodology chapter or Appendix I). An Individual Educational Plan "IEP" was designed for each child using The ABLLS. (Samples of The Individual Educational Plan "IEP" for Alex and Isaac are provided in Appendix U and Appendix V) in order to give the reader a clear picture of what is used in each child's IEP. The reason for choosing Alex's IEP because he is an advanced verbal learner while Isaac is an early learner and a non verbal child.

After designing and agreeing on the child's IEP, the programmes that the child needs to work on is put on the all programmes sheet with the start and mastered date of each programme (See Appendix N).

The basic intervention programme in behavioural treatment of autism. (Maurice, Green & Luce, 1996), consist largely in identifying goals in terms of specific behaviours to be altered in frequency; recording targets behaviours; identifying effective forms of reinforcement; the development of operant stimulus control, stimulus prompting, and the fading of prompts; and the development of chaining, generalisation, rules, imitation, modelling and other well know behavioural procedures (Sundberg & Michael, 2001). With respect to research according to Sundberg and Michael there is an emphasis on within-subject (also called single subject) experimental comparisons, direct observation as opposed to the use of mental tests and self reports.

4.2.4 Teaching using AVB

All the children were assessed and an IEP was set for each one of them. Teachers and parents have participated in the designing of the IEP. All the children that participated in the study, apart from Alex were in need of attending skills, cooperation and reinforcers' effectiveness programmes. (For more details see Appendix I). In order for a child to be able to communicate and learn s/he needs to have basic leaner skills (section 1 in The ABLLS). Because language underlies most learning in the typical child and is so conspicuously defective in children with autism, developing language skills is seen a major goal of any training program (Sundberg & Michael, 2001). The training consists of the applications of the behavioural technology (described above and throughout this chapter) to what is usually called communicative behaviour (Sundberg & Michael, 2001). With preferred reinforcement, the child is taught to look at an instructor, react appropriately to verbal stimuli by following simple instructions (sit down) and identify stimuli by pointing or touching (touch mouth). The child is taught to imitate the movements of the instructor by following the SD "do this", getting one of several reinforcement by pointing at it (when responding to SD: what do you want?). imitate the instructor's vocal responses (Say... Cat), naming/labelling object and pictures of objects (what is this?) and so on, with the tasks becoming more complex as the child learns to respond or perform the simple ones.

Upon request:

- The child needs to respond to his name while maintaining eye contact (Eye Contact Programme, Appendix W)

- The child should to come to the person when called by his name (Come Here Programme Appendix X).

- The child should learn to wait appropriately in a way which is meaningful to him (Tolerance Programme Appendix Y).

- The child should be able to imitate some gross and fine motor skills, especially for a non-verbal child which is a first step in teaching Makaton or any sign language.

- The child should be able to imitate non-verbal imitation using objects in order to teach the child how to deal with toys and objects in a proper way.

- The child should be able to match identical/non-identical objects or pictures in order to be able to discriminate and pay attention to small details (Matching Programme).

- The child should be able to imitate or echo verbal instructions (for the non-verbal, we work on producing movement of the mouth as in Oral Motor Skills).

- The child should be able to respond and follow instructions receptively (Receptive Language Programme).

The researcher has worked with the children's teacher in order to motivate the child into learning. Using the reinforcers preferred by each child in order to pair it with social reinforcer such as social praises, and gradually teach the child new skills that he needs, bearing in mind that a reinforcer could differ between the children as a reinforcer for one child could be an aversive to another.

4.2.5 Periodical Assessment of the Children

After designing and agreeing on the child's IEP, the programmes that the child needs to work on are put on the all programmes sheet with the start and mastered date of each programme (See Appendix N). Each programme has a number of items for example non-verbal imitation gross motor programme, the teacher works with the child on a specific items stating the start date of each item (please see Appendix Z). The teacher works with the child and fills a daily sheet on every single item which is set for each of the target skills in order to collect data: on acquiring the skills, putting it on maintenance or in acquisition. Once mastered, the item on the daily sheet moves to the Programme sheet where a mastered date should be entered to every single item. Once all the items on the programme are mastered, a mastered date should be entered on all programme sheets next to Non Verbal Imitation Gross Motor Programme.

The children's performance is noted and filled in the daily sheets and transferred to the programme sheet, once all the number of items in the programme sheet are mastered it moves to the all programmes sheet with a mastered date.

The children's review occurred at regular intervals: Each child has an annual review or end of year assessment (for a sample, see Appendix Q). In addition, children's progress is monitored in daily where day to day data on each child was gathered in order to measure the child's progress and update the programmes (see Appendix O). weekly and a periodical assessment which is sent to parents to report on the children's progress, and later on arranging meeting with parents, where the teachers and the researcher can report and discuss the children progress. Final assessment of all the children is conducted

separately for each child except where group instruction work is assessed, the assessment is videotaped and parent are invited to watch it after sending them the final report and assessment of their children.

4.2.6 Final Assessment of the Children

All the enrolled children in this study were assessed post AVB intervention from four parties: researcher, independent psychologist, parents and teachers. (See chapter 5, 6, & 7 for detailed information). (A sample of final ABLLS assessment for Alex & Karl is given in Appendix Q)

As for Skills Tracking System which is a diagram for the results of Alex's & Karl's performance pre & post AVB. (See Appendix R). The reader is reminded that previous acquired skills are coloured with RED (Pre AVB), **the small circle (coloured red) next to each grid means that the student has scored 0.** While the new mastered skills are coloured with **BLUE (Post AVB)**

4.3 Training: Teaching Procedures of Applied Verbal Behaviour "AVB"

AVB is the science of Applied Behaviour Analysis. It provides structure for looking at human behaviour, what causes them and how to make them increase or decrease. In addition, it provides a basic structure to teaching new skills by breaking them down into small steps and teaching one step at a time and rewarding correct responses. It is important to mention that all the information regarding the teaching procedures of AVB

Programme are taken from: Teaching Language to Children with Autism or Other Developmental Disabilities by Sundberg & Partington, version 7.1, 1998):The basics information that is essential to know regarding the teaching procedures include:

1. **Establishing Operation "EO":** Establishing operations are the most important motivational variable in language training. It is a condition of deprivation or aversion which:

    - Temporally increases the effectiveness or value of reinforcer (food attention).

    - Temporarily increases the behaviours that have been caused (consequence) by that reinforcer in the past.

Things that affect Establishing Operation "EO"

   - **Deprivation:** When the child does not have the desired item for a while the value of this item increases. For example: if the child has been on Yeast/Casein free diet and he is not allowed chocolate for a while, chocolate becomes highly desirable.

   - **Satiation:** When the child excessively has had the desired item (chocolate). The value of the chocolate decreases. For example if the child eats large quantity of chocolate every day, he may not want it any more.

   - **Competing Establishing Operation "EO":** The value of some other behaviour becomes stronger than the desired item (decreases the value). For example: The child really wanted to play with the train (his desired item) but the teacher placed very hard demands on him and made work

harder that the value of escaping became stronger than the value of the train.

2. **<u>Shaping:</u>** A process through which we gradually modify the child's existing behaviour into what we want it to be. For example, teaching a child to label an apple, first by following instructions to touch the apple (receptive labelling) before receiving reinforcer, then if he starts learning to say words we accept the beginning sound "ah", a syllable and eventually the word "apple".

3. **<u>Prompting:</u>** Help and assistance given by the teacher to the child to promote correct response. Prompts are paired with the instruction (SD). AVB uses errorless learning procedures to teach a child with autism. Under any circumstance the teacher is do not delay the prompt for more than 3 seconds.

    <u>Types of Prompts:</u>

- Physical: physical guidance or assistance is used during the early stages of teaching.
- Modelling and Demonstration: modelling prompts are usually modelled by a peer who performs the correct response. Demonstration prompts are usually shown by the teacher for the child to copy.
- Verbal cues: the teacher explains to the child "the one which is red".

- Positional prompts: placing the target stimuli close to the child.

- Prompts that linked to previous knowledge: for example the teacher ask the child to "touch apple" before asking him/her "what is it?"

- Other prompts could be used such as glancing, pointing and gestures.

- It is very important that all the teachers always try to use the least intrusive prompt that will cause the correct behaviour to occur.

4. **Fading**: this is a very critical part of teaching to make sure that children do not become prompt dependent. Any prompts used should gradually be removed or faded as the child becomes successful. For example, if the child is asked to "touch car" we can physically move his hand to the car and reinforce. Later provide less physical assistance by just touching his elbow, or pointing to the car etc…

5. **Chaining:** This means that skills are broken down into their smallest units and are taught in small units which are chained together. Forward and backward chaining are both used in teaching a new skill.

Example of forward chaining:

Discriminative Stimuli SD: "get dressed"

The child begins with no clothes on and is then expected to put pants on as a first step, once it is mastered the child is moved to the next step where s/he had to put pants and top on; once it is mastered the child is moved to another step where s/he

had to put pants, top and trousers on and so on until the child is fully dressed independently.

Example of backward chaining:

SD: "get dressed."

The child begins fully dressed without shoes and is expected to put shoes on as a first step, once this step is mastered the child is moved to the next step where s/he child is fully dressed without shoes and socks and s/he has to put socks and shoes on; once this step is mastered the child is moved to another step where s/he had to put on trousers, socks and shoes and so on, until the child is fully dressed independently.

6. **Differential Reinforcement:** Reinforcement is very important part of teaching. It involves providing a response to a child's behaviour which will most likely increase that behaviour. The term "differential" refers to that the teachers vary the level of reinforcement depending on the child's response. For example giving highly desired reinforcer by the child for less prompted trials V.S prompted trials. Using these techniques will teach the child to become more independent and less likely to become prompt dependent. The technique allows systematical change of reinforcement so that the child will eventually respond appropriately under natural schedules of reinforcement (occasional) with natural types of reinforcers (social or secondary reinforcers).

4.3.1 The Essential Elements Necessary for Conducting "AVB" Intervention:

Teaching Language to Children with Autism or Other Developmental Disabilities is a book by Sundberg & Partington, version 7.1, (1998) which has been used to design programme for children with autism. The main focus of this book is on the use of B.F. Skinner's (1957) Analysis of Verbal Behaviour as a guide for language assessment and intervention. All the AVB programme and techniques which were used for this research were taken from the above mentioned book.

Establishing and implementing the AVB programme for children with autism should be considered by numbers of important factors.

1. The first requirement is that teachers or those providing the intervention must have a specific set of teaching skills. Research has shown that the techniques derived from ABA i.e. behaviour modification have been the most successful approach for working with children with autism (Maurice, Green, & Luce, 1996). Therefore, the teachers who actually conduct the day-to-day AVB intervention programme with autistic children need to be skilful in the basic techniques of Applied Behaviour Analysis. All the teachers must know how to use the basic techniques of shaping, prompting, fading, chaining, and differential reinforcement. These skills are not so easy to acquire, that is why an intensive training and ongoing workshops and supervision were conducted for both teachers and parents.

2. The second requirement is that teachers must have some knowledge of the various types of augmentative communication such as Makaton sign language and PECS.

Research has demonstrated that these alternative forms of communication can be successful in establishing communication skills for non verbal children.

3. The third requirement for the establishment of the AVB intervention is the use of an effective assessment and curriculum, as well as acquisition tracking system. The use of assessment is to find out exactly what each child needs. The use of curriculum is to provide teachers and parents with a guide as what to teach each child, and the tracking system is to make sure that the targeted skills are acquired or mastered.

4.3.2 Description of "AVB" Teaching Methods:

Methods described herein are published in the journal "*The Analysis of Verbal Behaviour"* and in the published research of Drs. Sundberg and Partington (1998) and included in their book "*Teaching Language to Children with Autism and Other Developmental Disabilities"*.

1. **Errorless teaching:** This method leads to higher rates of correct responding and lower rates of task avoidance and problem behaviour.

How to apply it:

- Prompts should occur before the behaviour, not after the behaviour as a consequence for incorrect responding.

- Fading the prompts as quickly as possible while insuring correct responding. The fading of the prompt is done by reducing the physical dimension of the prompts and then increasing the time (time delay) between SD and the prompt. Allowing no more than 3 seconds delay.

- Avoiding the use of No, No prompt procedure.

2. **Fast Paced Instructions:** This method leads to higher rates of correct responding and less task avoidance.

How to apply it:

- Teacher should decrease the intervals between presentations of SD's.

- Teachers should use errorless teaching procedures to insure quicker responding.

3. **Mixing and Varying Tasks:** It reduces problem behaviour, enhances generalization and increases rate of acquisition of skills.

How to apply it:

- Teacher should present tasks one after another from many skill areas during intensive teaching sessions.

4. **Reducing response difficulty and/or effort**: It reduces task avoidance and problem behaviour and increases correct responding.

How to apply it:

- Mix tasks which require little effort for reinforcement and are easy for the child with responses which are difficult and needs more effort.

5. **Teaching the child to respond quickly and correctly (requiring fluency) and not just correctly:** Fluency leads to greater retention, functional use of skills learned, greater endurance of repertoire and increase application of the skills.

How to apply it:

- Measuring rate per minute of child's responses instead of percentage correct.

- Setting goals for child's responding based upon rate per minute.

- Prompting responses immediately (within 3 seconds) to insure quick responding.

- Prompting and prompt fading effectively so that presentation of the next SD is the reinforcer for the previous response.

4.3.3 The Implementation of an Effective Language Programme using AVB:

The most complex task faced by professionals in teaching children with autism is the development and the implementation of effective language intervention programme. (Sundberg, Partington, 1998 p. 255; Koegel, Surratt, 1992; Elliot & Soper, 1991). Teaching language for many children with autism requires intensive training and language skills must be directly taught to them, and careful programming should be provided in order to ensure generalization and spontaneity of those language skills to be occurred in the natural setting. In addition, children with autism need to eventually acquire new type of language skills without highly trained staff. Literature on autism suggests that a behavioural approach is the most effective programme which can provide the necessary element for successful language instruction (Maurice, Green & Luce, 1996). However, there are several different behavioural approach, two common approaches have been identified as Discrete Trial Training (DTT) e.g. Lovaas, 1981; Smith, 1993), and the natural language paradigm or Natural Environment Training (NET)

e.g., Koegel, O'Dell, &Koegel, 1987). Koegel, Doege, and Surratt (1992) provided a summary of the basic elements of these two approaches (figure 4.3)

4.3.4 Natural Environment Training NET:

The essential feature of Natural Environment Training "NET" by Koegel, et al, (1987) involve focusing on the child's immediate interest and activities as a guide for language instruction. NET is conducted in the child's typical daily environment such as home, school, playground and community, rather than in a formal teaching arrangement. In NET stimulus and response variation is stressed and the consequences for correct verbal response are specific to the child's interest or activities, rather than the consequences that are irrelevant to the response (giving the child the car for identifying a car rather than giving him a piece of chocolate).

The advantages and disadvantages of using NET are shown in figure (4.1).

In the recent studies of research by Elliot, Hall & Soper, (1991); Koegel, Koegel, Surratt, (1992) in attempt to determine which behavioural approach to language instruction (DTT or NET) produced better results. The findings of these studies were biased by Elliot et al. (1991) who made their assessments under conditions favouring the DTT training to NET. However Koegel, et al. (1992), using different methodology found that "teaching language to autistic children in a natural teaching context typically produced more correct target behaviour than an analog (DTT) approach. The results also added to the literature

by showing that the children exhibited considerably less disruptive behaviour during the natural language conditions" (p.151).

Advantages of NET	Disadvantages of NET
The use of child's EOs to guide language instructions.	Training is difficult to conduct in formal classroom.
Better condition to teach manding.	Must be able to capture or contrive ongoing EOs.
Use of the stimuli in the child's natural environment as target stimuli.	Child's EO may be unknown to the trainer.
Reduced need for elaborate generalization procedures.	Cumbersome to always follow the child's EO
Reduced amount of negative behaviours	Cumbersome to always deliver specific reinforcement.
Reduced need for aversive control.	May be difficult to eliminate the role of the EO as a source of control.
Easier to teach Intraverbals behaviour as separate verbal operant.	Requires better training on the part of staff.
The verbal interaction is much more characteristic of typical verbal interactions.	Curriculum is not scripted so it is more difficult to know what to do.
More opportunities for trainers to be paired with successful verbal interactions.	Data collection is much more complicated.
Verbal responses can be mixed together more easily under the environmental conditions that may evoke them later.	Substantially reduced number of training trials.
Training conditions are closer to those of kindergarten and how child may be taught in the future.	Training may compete with the establishment of other types of stimulus control.

Figure (4.1) The Advantages and Disadvantages of NET in Teaching Language to Children with Autism according to Sundberg and Partington (1998).

Given the results of both studies by Elliot et al., and Koegel, et al it would seem that professional should conduct the NET approach in order to teach children with autism rather than the DTT approach. However, which approach is the most effective is not that simple. There is a wide variation among children with autism, no single approach should be used solely and expecting it to be effective for all the children. The studies above for both approaches were not based on a behavioural analysis of language. The behavioural approach they used employ behavioural techniques (prompting, reinforcement) and they

neglected important environmental variables, they focused on the receptive and expressive language.

While Skinner's analysis of verbal behaviour considers language as a learned behaviour under the control of a variety of different environmental variables. (Skinner's 1957). Skinner identifies and functionally classifies the different type of environmental variables such as reinforcement, motivation, extinction, and punishment. This view of language differs substantially from other views that assume language is primarily caused by cognitive and biological variables. (E.g. Brown, 1973; Chomsky, 1957; Pinker, 1994). In addition, Skinner goes beyond the classification of receptive and expressive language by distinguishing between receptive language and 5 functionally independent type of expressive language:

1. Echoic/motor imitation/copying a text;

2. Mand;

3. Tact;

4. Intraverbals;

5. Textual/transcriptive: spelling.

The functional properties of verbal behaviour consist of the circumstances under which responses occur, more specifically, an analysis of the discriminative stimuli, establishing operation EO (motivation), and consequences that control response.

4.3.5 What is Discrete Trial Training DTT?

DTT is one technique which is used in both traditional ABA (Lovaas approach) and

Applied Verbal Behaviour programme "AVB". This technique involves the following:

- Breaking a skill into smaller parts.

- Teaching one sub skill at a time until mastery.

- Providing concentrated and structured teaching setting.

- Providing prompting and prompt fading as necessary.

- Using Reinforcement procedures.

The advantages and disadvantages of using Discrete Trial Training "DTT" are shown in figure (4.2).

Advantages of DTT	Disadvantages of DTT
Higher number of training trials	Special procedures to ensure generalization are required.
Easier for different staff members to implement.	Prompts to respond often not present outside the training session.
Good way to develop tact, receptive, echoic, and imitative behaviour	Child's current EOs not used in training.
Easier to run in a classroom setting	Mainly teachers initiated activities.
Instructional stimuli and detailed curriculum for the staff	Mand training is difficult because it requires using EOs and specific reinforcement.
Target response are known	Intraverbals behaviour typically not taught as a separate verbal operant
Contrived consequence are easier to deliver	Drill nature of the training may generate rote responding.
Data collection, are straight forward.	Non functional nature of the training may generate escape and avoidance behaviours.
Progressive steps in the curriculum clearly identified (e.g. noun verbs and pronouns).	Language and language trainers may become paired with aversive situations.
Progress or lack of it is very observable.	Trials are presented in a scripted manner, reduces the teacher's ability to expand on responses as in typical verbal interactions.
May help to establish stimulus control if learner repertoires.	Interaction between speaker and listener is very different from that observed by typical speakers and listeners.

Figure (4.2) Advantages and Disadvantages of Discrete Trial Training "DTT" according to Sundberg and Partington (1998).

Each teaching sessions involves repeated trials, with each trials having a Discriminative Stimuli/ SD (The Instruction), a Response/ R (behaviour) and a Reinforcing Stimuli /SR (the consequence i.e. reinforcement or prompt fade prompt).

Discrete Trial Training (DTT) consists of 3 components:

SD -------------------------------- R -------------------------- SR

Discriminative stimuli   Response   Reinforcing Stimuli
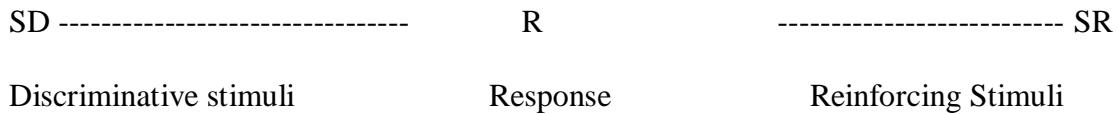
- **Stimuli:** anything that a person can experience through their senses. Anything that can be seen, heard, smelled, felt or tasted.
  Neutral Stimuli: dad says to the child "touch the dog". Child hears it but this sentence is not associated with anything positive or negative.

- **Discriminative stimuli:** SD dad says "touch the dog" and holds the child hand guiding him to touch the dog. When the child touches the dog, dad says "that is right" and gives the child a hug and a kiss. The child enjoys this (reinforcer). So when dad asks the child to touch the dog he does it without any help in order to get an immediate reinforcement.

4.3.6 The Use of DTT and NET in the AVB Programme:

In AVB Programme DTT and NET are both used. The exclusive use of only one of these approaches may be less effective than the combination of the two, guided by Skinner's analysis of Verbal behaviours. The use of DTT in the AVB programme is not applied in the traditional DTT format. In the AVB Programme DTT are Discrete Mand Training

Trials following the child's EOs and the teacher should pair themselves with reinforcing activities. The balance between DTT and NET may change frequently during the acquisition process. Therefore, five general phases are noted (as described in the table below); however, blends of these phases may vary widely with each child.

In phase 1, the teacher is following the child EOs (motivation) and pairing herself with reinforcers and gaining compliance. For example: the child's EOs is to watch a Tarzan on a portable DVD the teacher put the movie on, without placing any demands on the child then later she put it off for few seconds to gain the child's attention and prompting the child by either saying movie or signing movie (if he is non verbal) then the teacher put the movie on immediately… the teacher repeat this process and prompt the child to mand for the movie. The teacher will gradually fade the prompt until the child is able to mand for the movie independently.

Phase 1: NET>DTT	Focus on early manding, pairing, compliance, stimulus control.
Phase 2: NET=DTT	Focus on mand, tact, receptive, imitation, echoic, and Intraverbals.
Phase 3: DTT>NET	Focus on academic activities and specific skills development.
Phase 4: NET>DTT	Focus on learning from group instruction, from peers, and training is more like that of typical kindergarten and 1st grade classrooms.
Phase 5: DTT>NET	Focus on academic skills and structured learning characteristic of later elementary classrooms.

Figure (4.3) The use of DTT and NET in the AVB programme according to Sundberg and Partington (1998).

In phase 2, the teacher is still working on getting the child to mand (using his EOs) teaching the child to tact, receptive, imitations, echoic and Intraverbals. During this phase the child is learning to work for extended period of time at a table.

In phase 3, the focus is on the academic activities/skills, and behaviour. NET is also used to generalize the acquired academic skills.

In Phase 4, the child is learning in a less intensive setting.

Phase 5, focuses on a more structure academic activities.

To summarize, NET and DTT can be both effective for teaching language to children with autism. NET is based on mand training following the child's EOs (motivation) and delivering specific reinforcement. While DTT is based on tact, receptive, echoic, and imitative training by using verbal and non verbal stimuli and non specific reinforcement.

4.3.7 Operant Technique

If the behaviour reinforced, the frequency of that behaviour will increase where as if reinforcement is withheld, the frequency of that behaviour will decrease.

Relationship between behavioural and environmental events is referred to as contingency "ABC" of behaviour:

	A	B	C

A | B | C

Antecedent | Behaviour | Consequence
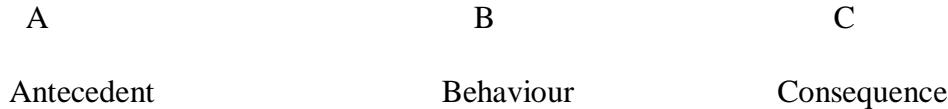
Antecedent: Refers to the stimuli that triggers/occurs before the behaviour.

Behaviour: Refers to the act itself.

Consequence: Refers to any events that immediately follow that behaviour.

Why the use of "ABC" method?

The ABC method has three clear parts which makes it easy to the child with autism to learn the skill that s/he needs.

Ex:

1. The child is told not to eat the paper   child eats the paper   Nausea/vomiting

    Antecedent   Behaviour   consequence

2. Phone rings   you answer it   the caller speaks to you

    A   B   C

Discrete Trial Training DTT related to the ABC of Behaviour: both have 3 parts component that help us to understand, control and shape/change the behaviour.

Discriminative stimuli "SD" = Antecedent

Response "R" = Behaviour

Reinforcing Stimuli "**SR"** = Consequence

Behaviourists can manipulate the 3 components to either increase, decrease or shape behaviour.

Giving Discriminative stimuli "SD" = The teacher should always use simple and clear voice when s/he gives instructions to the child.

Response "R" = The Response could be an action, movements etc...

Reinforcing Stimuli "**SR"** =

- If a response is reinforced, the frequency of that particular behaviour will increase.

- If a response is not reinforced, the frequency of that particular behaviour will decrease.

The instructors should be consistent of what they do or do not do when they reinforce.

- If a child is correct in response = a reinforcer should be delivered immediately.

- If a child is incorrect in response = the instructor should say no.

- Reinforcement should be contingent (only available when target behaviour occurs) reinforcers should be tailored and individualized to each child.

- Differentiate reinforcements: Providing the best rewards for the best behaviours or "hardest" work while saving the "OK" reinforcers for "OK" work.

- A variety of reinforcers should be used: this is to insure the reinforcer will keep its value as well as a way to give differential reinforcement.

- No mixed messages to the child: No should sound like No and not as Yes. For example the instructor should not say No with a smile on his face...

- The teacher fades reinforcement and pairs it with social praise.

- Rewards are not used as bribery: The instructor should not get the child in a habit of hearing in advance about the reinforcer he will receive. S/he should not remind the child of the reinforcer he would be getting if disruptive behaviour were not occurring. The instructor should not offer additional reinforcers when behaviour escalates in attempts to calm him down.

4.3.8 Reinforcement

Based on Skinner's (1953) learning theory is that behaviours are often dictated by their consequences. (By those events that immediately follow a Response):

- If a response is reinforced =   the behaviour increase.

- If a response is not reinforced =   The behaviour decrease

Positive reinforcement:

Positive reinforcement refers to giving or applying something that the child finds desirable and increases the future likelihood that behaviour will occur.

Primary reinforcers (unconditioned reinforces): their reinforcing properties are unlearned.

Ex: food drinks etc…

Secondary reinforcers (conditioned reinforcers): their reinforcing value is learned.

Ex: social praise. Smiles etc...

Tips for Positive reinforcements:

- Avoid satiation (use small amounts and variety of different items).

- Leave strong reinforcers to the therapy hours to increase its value if the child has access to it outside the sessions, the value of reinforcer will decrease.

- Conduct a reinforcement sampling: To assess the potential reinforcers, what could be reinforcing for one child could be a punishment for another.

- Use differential reinforcement: use powerful reinforcers to the best response. Best response should receive the best reinforcer.

Negative Reinforcements:

Negative reinforcement refers to the increase in the frequency of a response by removing an aversive event immediately after the response has been performed (Kazdin, 1994). In other words, taking away something the child finds aversive and increases the future likelihood that the behaviour will occur

Ex:

1. Child screaming

Because of loud music

The teacher does not stop the music

Child stops screaming and says no music

The teacher stops the music,

The behaviour has been negatively reinforced because it was followed by elimination

of an aversive event (loud music)

2. A parent nags a child for finishing his/her home-work.

The child finishes his/her home-work.

Parent stops nagging

R= child finishing home-work response was reinforced by the removal of the

nagging.

4.3.9 Using "AVB" Techniques to Reduce Mal-Adaptive Behaviours

In using the AVB model to reduce mal-adaptive behaviours, a functional assessment

must be conducted to determine the function of the behaviour in order to implement an

effective intervention.

Functional Assessment: In functional assessment, a common technique, a teacher

formulates a clear description of problem behaviour, identifies antecedents, consequents,

and other environmental factors that influence and maintain the behaviour, develops

hypotheses about what occasions and maintains the behaviour, and collects observations to support the hypotheses. (Myers, 2007).

There are four classes of controlling variables for aggressive or self injurious behaviour (Iwata, et al., 2000). These are:

- Socially mediated positive reinforcement: the function of this behaviour is to get attention. The child learns that a mal-adaptive behaviour will result in the presentation of positive reinforcement (a desired item by the child). The extinction procedure for this behaviour is by removing the positive reinforcement (i.e. eye contact etc.)

- Socially mediated negative reinforcement: the function of this behaviour is to escape and/or avoidance of demands. The child learns that a mal-adaptive behaviour will result in the removal of aversive stimuli. The extinction procedure for this behaviour would be to keep the stimuli/ demands present and prompt the child to carry out the task, and only remove the demand once the mal-adaptive behaviour stops.

- Automatic positive reinforcement: the function of this behaviour is to the self-stimulatory "stimming". It is a very difficult one to compete with. To deal with this function the child should be provided with a greater reinforcer and an appropriate teaching procedure (fluency and errorless teaching i.e. prompting the child through action should be used).

- Automatic negative reinforcement: this behaviour should be checked first to rule in or out where the child needs medical attention (earache headache…).

4.3.10 Counting procedures to deal with negative behaviour:

- If the child screams because he wants something (reinforcement is currently not available). i.e. the teacher could use this procedure if the child wants something s/he can have but not for inappropriate behaviour. The teacher should walk away from him, when the child calms down, the teacher should use pictures, signs or things until s/he figure out what the child wants.

- If the teacher knows what s/he wants, counting procedure should be used. The teacher should say "NO CRYING" and begins counting when the child stops crying, even if it is to take a breath at first. If the child begins to cry again:

  - The teacher repeats "NO CRYING" (teacher starts counting again each time the child stops crying).

  - Child: (eventually stops crying for a count of 10).

  - Teacher: prompts the child on his current level (hands over hand sign, pointing, or asking him "what do you want?".

4.4 Design and planning of "AVB" Programme

Children are initially assessed using the Behavioural Language Assessment Form (BLAF) to indicate if they are cooperative in instructional situation, if they can indicate their needs by signing gesturing or using words. In addition, the children's academic and social skills are assessed.

In order to gain cooperation from the child such as compliance with instructional requests, the child must first be taught that following instructions gets him access to more reinforcers and more easily than not following the requests. If this relationship is not established it will be very difficult to teach the child language and he will resort to his old maladaptive ways of getting reinforcement.

In order to accomplish compliance and cooperation the teacher should pair herself with reinforcement without placing demands on the child. During this process the teacher should not remove on-going reinforcing activities as well. Teacher should approach the child when s/he is not engaging in a reinforcing activity and deliver favourite reinforcers non-contingently.

4.4.1 Requesting the first response:

The reader is reminded that all the AVB techniques were adapted from Sundberg and Partington manual (1998).

- Teacher must choose an easy to do response such as responding to the child's name using a favourite reinforcer placed in front of the child eye and moving it towards the teacher's nose in order to gain child's eye contact (see Appendix W), when the motivation is high (strong EO) it provides an immediate pay off for the response.

- Using Applied Verbal Behaviour "AVB" model, the most important thing is to teach the child to ask for things s/he wants (manding). This is because the child is motivated to communicate for these things (has an establishing

operant). The child learns" I talk ", "I get" which gives the child a great deal of power.

- The use of non verbal imitation or receptive command technique (see appendix Z) is applied for those who are non verbal.

- At this point the sight of the teacher should mean that good things are about to occur and that the teacher will require some response but it won't be hard work to get desired items or events.

- Repeating many times the first response that the teacher requires to enable the child to take the reinforcer.

- Once cooperation is developed, in other words the child makes the first response repeatedly with no negative behaviour; it is time for the child to follow some simple request. The teacher must choose the behaviour that can be physically prompted to insure success. Such as Non Verbal Motor Imitation, or Receptive Command.

- The teacher should fade the prompts and increase the number of responses until the child achieves a high rate of responding. The criteria for success at this stage is that the child moves towards and approaching teacher rather than away.

- All the teacher and those involved in working with the children were trained to never use a reinforcer as a "bribe". They have been instructed not to get the child in a habit of hearing in advance about the reinforcer s/he will receive. In addition, they were trained not to offer additional reinforcers when behaviour escalates in attempts to calm the child down.

The staff and parents can use a promise if they want a child to come over to them, by having something he/she likes in their hand and give it to him when s/he comes.

4.4.2 Teaching the child to request

Once the teachers have established a variety of things the child is interested in (reinforcers) and they have paired themselves with these reinforcers (conditioned reinforcers) they should teach the child to ask for the item.

The two most important things to remember about teaching a child to request using any responses form are:

1. The child must want the item.

2. The child must be able to respond to the stimuli which are used in order to teach him to request them (mand).

Example:

Teacher: (cookie in her hand showing it to the child) says "cookie"

Child: says "cookie"

Teacher gives cookie to the child.

How to teach a child to ask for things out of sight?

Teacher: (cookie is visible) "what do you want"?

Child:" cookie" (child gets small piece of cookie).

Teacher: ((hiding cookie under the table) "what do you want?"

Child: "cookie" (child gets bigger piece of cookie).

Then gradually the teacher moves the cookie to the location it is usually kept in, out of sight.

4.5 Data Recording Procedures

AVB programme uses Probes of Performance (taking data of the first response by the child) to collect reliable data in order to overcome the problem of constant data recording after each response (DTT programme) and therefore makes it impossible to teach fluently and effectively. AVB uses Probe Data for the following reasons:

- Data recording procedures does not interfere with the instructor's teaching.

- Probe data are recorded in the following manner (See Appendix O):

  1. Arranging the learning situation and merely provide the antecedent (SD) for the behaviour.

  2. The teacher gives the student the opportunity to exhibit the behaviour without a prompt.

  3. If the correct response occurs quickly and accurately the teacher circles C for Correct (independently).

  4. If the behaviour does not occur then the teacher should prompt the behaviour and circle P for Prompt (not independently).

- Each skill will have a criterion for success associated with it. Some skills may require 3 days of independent responding on the daily probe to consider it to be mastered. Other skills may require only one day of independent responding to be considered mastered.

- The skill tracking sheet is designed to monitor target skill acquisition, maintenance and generalization.

    1. The skill area at the top of the sheet refers to areas such as, Intraverbals, Tacts; Motor Imitation etc… the teacher completes this section by placing the appropriate skill area in this section.

    2. The Target skill listing refers to the specific target skill being taught in the skill area listed at the top of the page. For example, Naming members of category would be listed as Name Food. If there is more than one category then the teacher lists the categories, not necessarily all the members of the category, e.g. apple, banana, orange etc. down the page. The list might include animals furniture, clothes etc. If the target skill is Tact (labelling) then the teacher lists the words being taught as the target skill.

Teachers have daily observations of the children and they write a summary of their observation to the parents of children on the communication books.

Summary

This chapter has described in depth the objectives and the implementation of the AVB Programme in The Autistic Centre, including the training of the teachers, and the assessments of the children. It has described the criteria for choosing the samples for this study. This chapter has looked at the essential elements necessary for conducting the AVB intervention; it has defined the AVB programme and its technique and components, and the implementation of an effective language programme. This chapter has discussed

the comparison between DTT and NET and the data collection methods of the AVB

programme. Next chapter will discuss the summary of the results.

Chapter 5 - Summary of Results:
Tests and Assessments

The purpose of the previous chapter was to look in depth at the intervention places and processes, and to define the implementation of an AVB Programme in the Autistic Centre. This chapter will describe the outcomes of the study by presenting and analyzing the findings of the children's progress and performance by the researcher and the independent psychologist. It will cover the following issues:

5.1 Parenting Stress Index "PSI" Short Form.

5.2 Period of Attendance of the Children.

5.3 Childhood Autism Rating Scales "CARS" by an independent psychologist.

5.4 The Behavioural Language Assessment Form "The BLAF".

5.5 The Assessment of Basic Language and Learning Skills "The ABLLS".

The essential purpose of the research is to study the effects to children and their parents of implementing a carefully structured programme based on an Applied Verbal Behaviour "AVB" designed to promote academic functioning, language and adaptive functioning. As previously stated in the Methodology Chapter, the researcher will use The Behavioural Language Assessment Form "The BLAF" and The Assessment of Basic Language and Learning Skills "The ABLLS" in order to measure the children's progress

in the area of Basic learner Skills, Academic skills, Self- help skills and Motor Skills. To validate the children's outcomes the researcher has developed the evaluation form questionnaire which has to be filled by parents and teachers and allow them to report their children's progress or lack of progress (will be discussed in the next chapter). In addition, one year before starting the AVB intervention, the children were assessed using Childhood Autism Rating Scales "CARS", by an independent psychologist (the children were attending different school or centre) and they were re- assessed again at the beginning and the end of the AVB intervention. As children with autism exhibit behavioural difficulties which will affect their relationship with their parents and make it difficult to communicate, a Parenting Stress Index was filled by the parent at end of the intervention to measure their stress level and compare it to the pre-interventions scores. The Parenting Stress Index was essential to use for this research in order to study the effects of implementing the AVB on the children's parent relationship by measuring their stress level before the AVB intervention and after.

The reader is advised while viewing the figures throughout this chapter that when a pre - AVB does not show a score, it means that the child had scored 0.

5.1 Parenting Stress Index "PSI"

Parenting Stress Index Short Form "PSI" is a questionnaire which contains 36 statements (a standardized test by Psychological Assessment Resources Inc, 1995), where parents are instructed to read each statement carefully. For each statement, the parent are instructed to focus on the child who is the most they concerned about (the child

participating in the study), and parents were requested to circle the response that best represented their opinion.

- Circling the SA if they strongly agree with the statement (5 points each).

- Circling the A if they agree with the statement (4points each).

- Circling the NS if they are not sure (3 points each).

- Circling D if they disagree with the statement (2 points each).

- Circling SD if they strongly disagree with the statement (1 point each).

Parents may circle one response only to each statement and they should respond to all statements. (The parents do not have the scores criteria). High scores indicate high stress level.

- Questions 1, 2, 3, 7, 8, 9, 11 are related to defensive responding where it is significant if the score is 10 or less.

- Questions 1 to12 are the sum of Parenting Distress (PD).

- Questions 13 to 24 are the sum of Parent Child Dysfunctional Interaction (P-CDI).

- Questions 25 to 36 are the sum of Difficult Child (DF).

- Total Stress scores are the sum of PD, P-CDI & DC.

Parents were handed out the Parenting Stress Index "PSI" short form through the school, first at the beginning of the academic year and then again after the implementation of the AVB Programme at the end of the academic years . The forms were returned to the

researcher within a week. The scores from the pre and post intervention were entered in the Microsoft Office Excel 2003 and both scores were compared.

The participation of both parents in the study was greatly encouraged. However not all fathers agreed to fully participate as indicated in the father Parenting Stress Index "PSI" (figure 5.2).

Figure (5.1) indicates that the majority of the Mother's Stress Level had significantly decreased. The reader is reminded that only one child's mother did not participate in the study as she is divorced and living away from her son. In this standardised Parenting Stress Index high scores indicate a higher stress level. Analyzing the results of the tests, it can be seen that majority of the parent's stress level had decreased tremendously comparing the pre- and post AVB intervention. For example, Hassan's mother stress level had decreased by 54 points (30% decrease in stress level) which is the highest decrease which indicated improvement in number of issues such as a better mother child relationship, less parental distress, and more co-operative child. This was followed by Alex's mother which her stress level was decreased by 53 points (29.4% decrease in stress level) and Sarah's mother stress level decreased by 52 points (28.88% decrease in stress level). The lowest decrease in stress level which is still a good out-come was 35 points (19.45% decrease in stress level) that Zach's mother had scored (for percentage of PSI Short Form see figure (5.2).

Mother's Stress Level
Pre and Post AVB Intervention
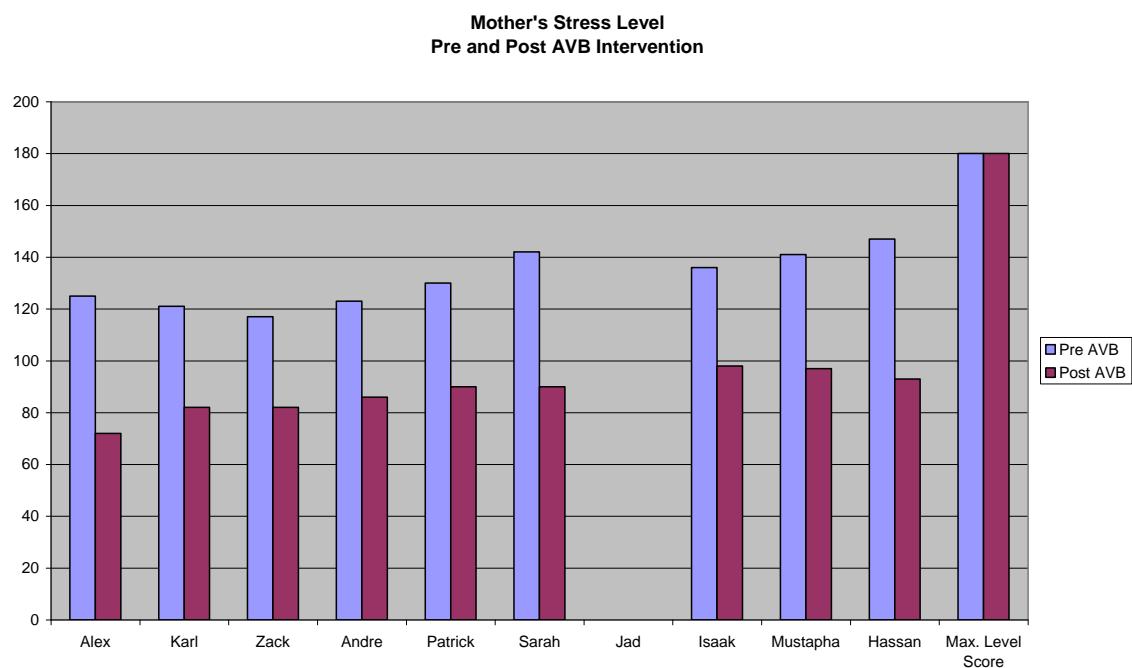
Figure (5.1)   Mothers' Parenting Stress Index

Names of Children	Period of attendance in Days	Pre AVB	% Pre	Post AVB	% Post	% Rate of Improvement
Alex	293	125	69.4	72	40	29.40
Karl	305	121	67.22	82	45.55	21.67
Zack	279	117	65	82	45.55	19.45
Andre	148	123	68.33	86	47.77	20.56
Patrick	139	130	72.22	90	50	22.22
Sarah	120	142	78.88	90	50	28.88
Jad	142					
Isaac	142	136	75.55	98	54.44	21.11
Mustapha	123	141	78.33	97	53.88	24.45
Hassan	137	147	81.66	93	51.66	30
Max. Level Score	310	180	100	180	100	100

Figure (5.2) Mother "PSI" Percentage of Improvement Out of Maximum Score
High Percentage Indicates High Stress Level

The Father Stress level figure (5.3) shows the lack of participation of some parents where five fathers did not agree to fill the form, they did not want to explain the reasons for non- participation. While two fathers agreed to participate initially and took part in the Pre- AVB intervention to measure their stress level, however, they did not want to measure their stress level after the intervention, and commented that their participation would not make any difference in studying the effects of implementing an AVB programme. Only three fathers fully participated in this test where their tests showed a marked decrease in their stress level. Alex's father stress level had decreased by 53 points (29.4% decrease in stress level); while Jad's father stress level had decreased by 33 points (18.33% decrease in stress level). However, Karl's father stress level had decreased only 23 points (12.77% decrease in stress level). For percentage of rate improvement for each participant see figure (5.4).
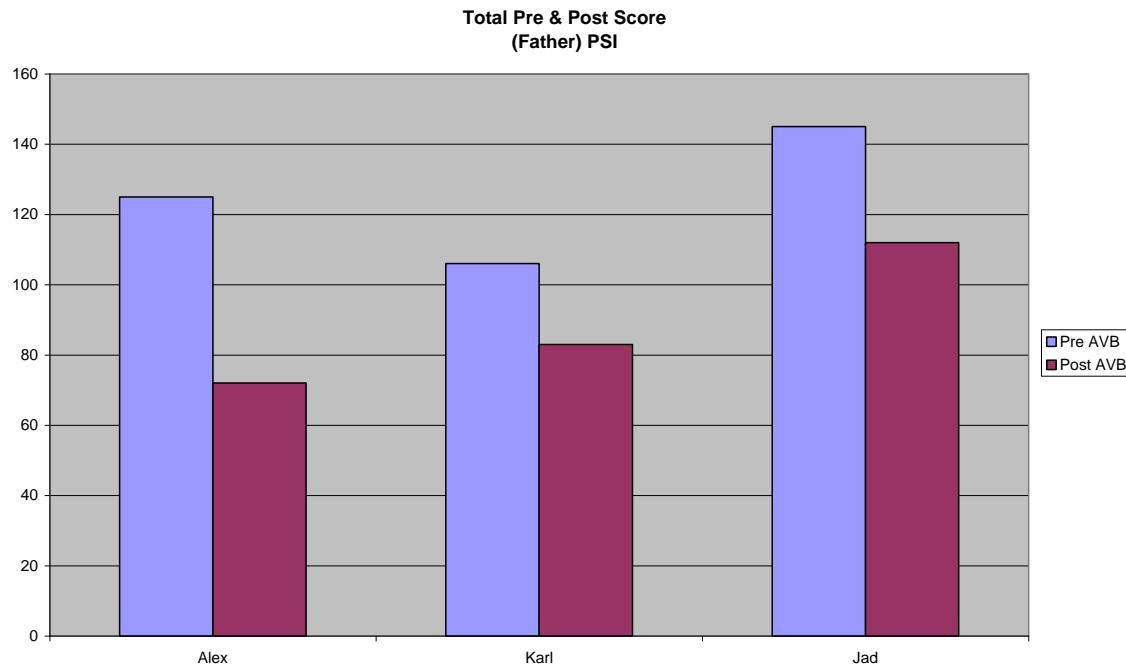
Figure (5.3)   Fathers' Parenting Stress Index

Names of Children	Period of attendance in Days	Pre AVB	% Pre	Post AVB	% Post	% Rate of Improvement
Alex	293	125	69.4	72	40	29.4
Karl	305	106	58.88	83	46.11	12.77
Zack	279	119	66.11	N/A	N/A	N/A
Andre	148	100	55.55	N/A	N/A	N/A
Jad	142	145	80.55	112	62.22	18.33
Max. Level Score	310	180	100	180	100	100

 Figure (5.4) Father's Parental Stress Index "PSI Short Form"
Percentage of Improvement Out of Maximum Score
High Percentage Indicates High Stress Level

In summary, the parental stress level showed considerable decrease of stress of all the participated children in this study. The results of the PSI Short Form indicate that the improvement and progress of the children using the AVB programme have affected the stress level of their parents' and caused the decrease in their stress level which as a result allowed better parent - child relationship. The use of the PSI Short Form was limited for this study because not all the fathers have participated and completed the PSI form.

5.2 Period of Attendance of the Children

Ten children participated in this study. However, not all of them have received the same amount of AVB Therapy because some participated for two years (Alex, Karl, and Zack) and some for one year only.

The period of attendance for each child participated in the study was varied, as it can be seen from the bar chart below figure (5.3), where the period of attendance in days over 2 academics years was 310 days. Only 3 children had attended the school over 2 academic years: Alex 293 days, Karl 305 days and Zack 279 days. The rest of the children were able to attend one academic year with various attendances: Andre 148 days, Jad and Isaac 142 days, Patrick 139 days, Hassan 137 days, Mustapha 123 days and Sarah 120 days.

Period Of Attendance in Days
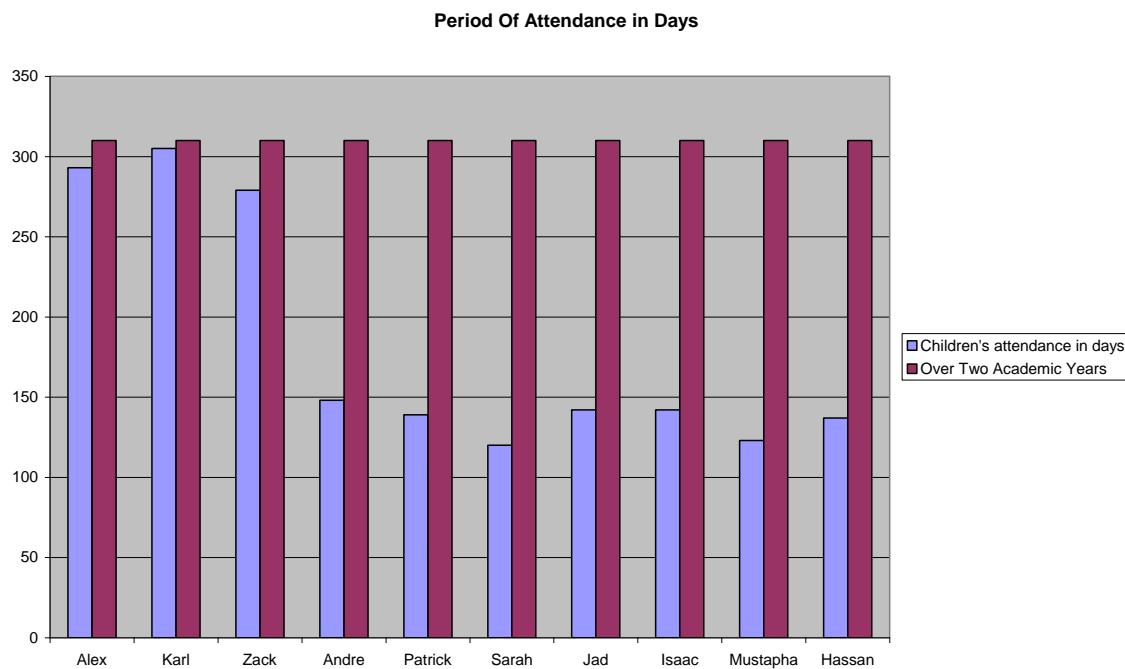
Figure (5.5)   Children's attendance in days out of two academic years.

Figure (5.5) has clearly shown that not all the children have experienced the whole AVB programme with the same period of attendance. Only three children Alex, Karl and Zack

did receive the AVB programme over 2 academic years while the rest of the children have received the AVB programme over 1 academic year. The difference in the children period of attendance at The Autistic Centre may raise the question of what would be the outcomes of the children if they had experienced the whole AVB programme at the same time (see Chapter 8).

5.3 Childhood Autism Rating Scales C.A.R.S. by Schopler (1988)

Childhood Autism Rating Scales (C.A.R.S) is designed by Eric Schopler (1988), it was developed to identify children with autism and to distinguish them from developmentally handicapped children without the autism syndrome (Schopler et.al, 1988), and CARS distinguishes children with autism in the mild to moderate range from children with autism in the moderate to severe range. It was conducted by an independent psychologist in order to measure the children progress in different areas of functioning. The highest the scores the children have the more severe type of autism they exhibit. A child who scores from 15 to 30 is considered non autistic, a child who scores between 31 and 38 is considered child with mild to moderate autism, and child who scores 39 to 60 is considered a child with severe autism. C.A.R.S. assesses children in the following areas (Schopler, et al., 1988):

1. Relation to people: This is a rating of how the child behaves in a variety of situations involving interaction with other people.

2. Imitation: This rating is based on how the child imitates both verbal and non verbal acts.

3. Emotional Response: This rating of how the child reacts to both pleasant and unpleasant situations.

4. Body Use: This scale represents a rating of both coordination and appropriateness of body movements.

5. Objects Use: This is a rating both of the child's interest in toys or other objects, and his uses of them.

6. Adaptation to change: This scale concerns difficulties in changing established routines or difficulties in changing from one activity to another.

7. Visual response: This is a rating of unusual visual attention patterns found in many autistic children.

8. Listening response: This is a rating of unusual listening behaviour or unusual responses to sounds.

9. Taste, Smell and Touch Response and Use: This is a rating of the child's response to stimulation of taste, smell and touch senses including pain.

10. Fear & Nervousness: This is a rating of unusual or unexplainable fears. However, it also includes rating of absence of fear.

11. Verbal Communication: This is a rating of all facts of the child's use of speech or language.

12. Non - Verbal Communication: This is a rating of the child's nonverbal communication through the use of facial expression, posture, and gesture and body movement.

13. Activity Level: This rating refers to how much the child moves about in both restricted and non restricted situations.

14. Level and Consistency of Intellectual Response: This rating is concerned both with the general level of intellectual functioning and with the consistency of functioning from one type of skill to another.

15. General Impressions: Subjective impression of the degree to which a child is autistic.

All the enrolled children in this study were assessed by an independent psychologist a year before enrolling at The Autistic Centre. The assessment took place at an independent clinic in Beirut which has a specialized team of psychiatrists and psychologists in order to diagnose and evaluate children with special needs. The researcher had an access to the children available CARS assessment, apart from Karl, Patrick and Hassan because as "The Autistic Centre" was their first school they joined where they received their first CARS assessment by the same independent psychologist. All the children were assessed again by the same agency before starting the AVB programme and after the implementation of an AVB intervention Programme.

The children participated in the research were assessed by an independent psychologist at the beginning and at the end of the academic year in their previous schools. Figure (5.6) shows that only two children out of seven (Alex and Jad) had shown a minor progress in their previous schools, while the rest of the children did not show any progress. Jad had improved by 2.5 points while Alex had improved by 2 points only. The way improvement is measured is by subtracting CARS' scores which was obtained at the end of academic year from CARS' score which was obtained at the beginning of academic year.
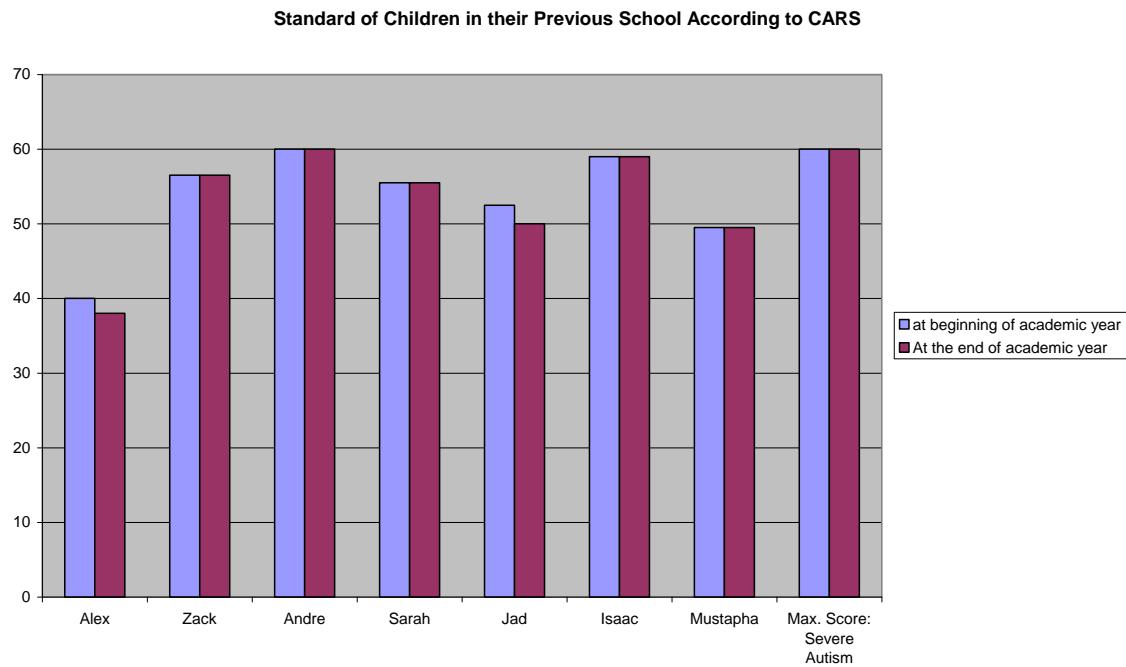
Figure (5.6) Standard of children in their previous school according to CARS

All the children participated in this research underwent a CARS assessment by the independent psychologist pre and post AVB intervention. Childhood Autism Rating Scales "CARS" is a standardized assessment where data is easy to code and analyze. The result of each child was entered in the excel programme (pre & post intervention) in order to get a bar chart which will present the findings. The data collected using CARS, had presented very interesting results which were detailed in the Bar Chart figure (5.7) below. The figure clearly indicates the decrease of autistic symptoms for all the children despite their age's range. For percentage of rate of improvement of each child see figure (5.8)One child's (Alex) diagnosis has improved to the point that his scores fell in the Non- Autism Category by the follow up test (post Intervention) where he improved by

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12.5 points (20.83%). However Jad had improved by 23 points which put him in the mild category of autism (38.34%).

CARS Post AVB Intervention
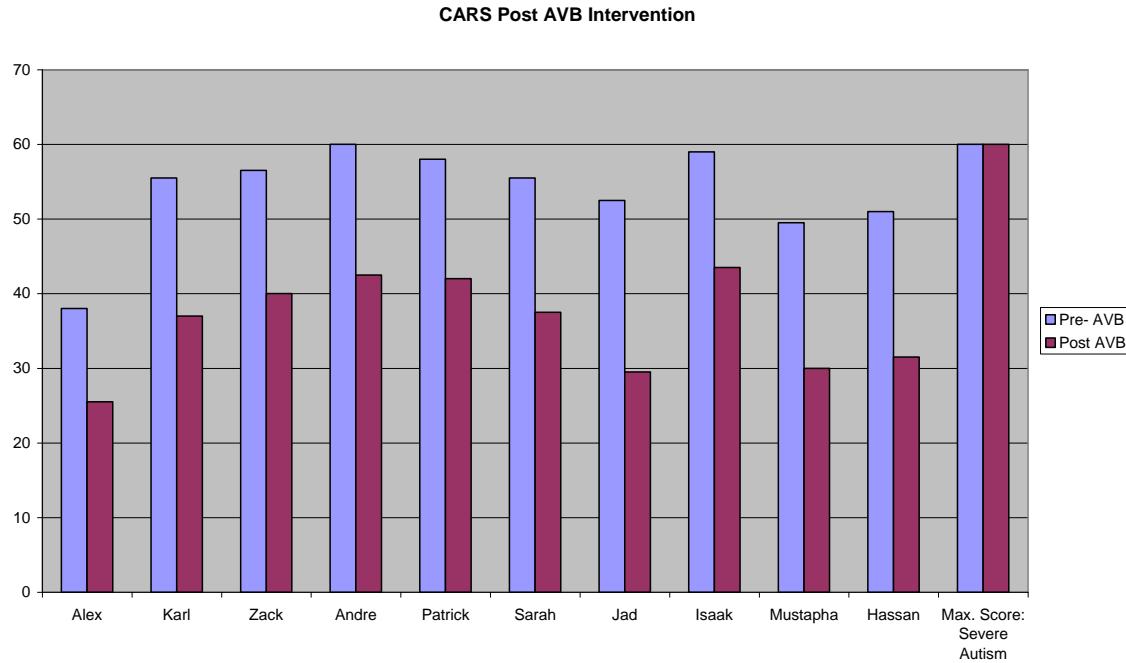
Figure (5.7)   Pre & Post Childhood Autism Rating Scales

Mustapha and Hassan had improved by 19.5 points (32.5%) and their post scores placed them on the margin of mild autism; Karl had improved by 18.5 (30.84%) while Sarah had improved by 18 points (30%); Andre had improved by 17.5 (29.17%)while Zack had improved by 16.5 points (27.5%), Patrick had improved by 16 points (26.66%) while Isaac had improved by 15.5 points (25.83%), their post scores put them in the moderate category of autism. The reader is reminded that the children's CARS results (improvement) are obtained by subtracting the pre AVB from the Post AVB scores.

Names of Children	Period of attendance in Days	Pre AVB	% Pre	Post AVB	% Post	% Rate of Improvement
Alex	293	38	63.33	25.5	42.5	20.83
Karl	305	55.5	92.5	37	61.66	30.84
Zack	279	56.5	94.16	40	66.66	27.5
Andre	148	60	100	42.5	70.83	29.17
Patrick	139	58	96.66	42	70	26.66
Sarah	120	55.5	92.5	37.5	62.5	30
Jad	142	52.5	87.5	29.5	49.16	38.34
Isaac	142	59	98.33	43.5	72.5	25.83
Mustapha	123	49.5	82.5	30	50	32.5
Hassan	137	51	85	31.5	52.5	32.5
Max. Level Score	310	60	100	60	100	100

Figure (5.8) C.A.R.S Percentage of Improvement Out of Maximum Score Higher percentage indicates severe autism

5.3.1 Reliabilities issues in using CARS

One of CARS limitation is that it may not be used with young children as there is limited data validating its usefulness in children as young as age two. As CARS was used by the independent psychologist with all the children involved in this study,   The reader is reminded that none of the children who participated in this study was less than 3 years old at intake.

Another reliability issue was showing a video of couple of children by their parents to the independent psychologist showing their children participating in social and fun activities.

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Summary

Analyzing CARS' results one year prior AVB Intervention, only 2 children had shown

very minor progress and the rest of the children did not show any progress at all.

However, examining the Pre & Post AVB Intervention all the children made considerable

progress where the severity of autism clearly decreased.

5.4 The Behavioural Language Assessment Form (The BLAF) by Sundberg & Partington (1998)

The BLAF is an introductory assessment. Initial data was taken on children to measure

their performance using The Behavioural Language Assessment Form "The BLAF". The

assessment is designed to reflect the average performance of typical two to three year old

children. Most of these typically developed children would have received a score of five

on each of the areas in the assessment (with exception of the numbers and letters

sections). This level of linguistic performance allows typical children to learn from their

everyday experiences. While children with autism might have some difficulties to acquire

the simplest levels of communication and to learn without an intervention programme.

The BLAF is a simple scale which is used in an initial meeting with each child, in order

to assess their current functioning level.

The BLAF is used to examine the children in different areas. It contains 12

different sections which cover a variety of early language skills and related areas.

Each section is broken down into 5 levels. For this test, high scores indicate better outcome.

On scale of 1-5, the assessor rates the children's ability to:

5.4.1 Cooperate with Adults:

    a.   Always uncooperative, avoids work, engage in negative behaviour.

    b.   Will do only one brief and easy response for a powerful reinforcer.

    c.   Will give 5 responses without disruptive behaviour.

    d.   Will work for 5 minutes without disruptive behaviour.

    e.   Will work well for 10 minutes at a table without disruptive behaviour.
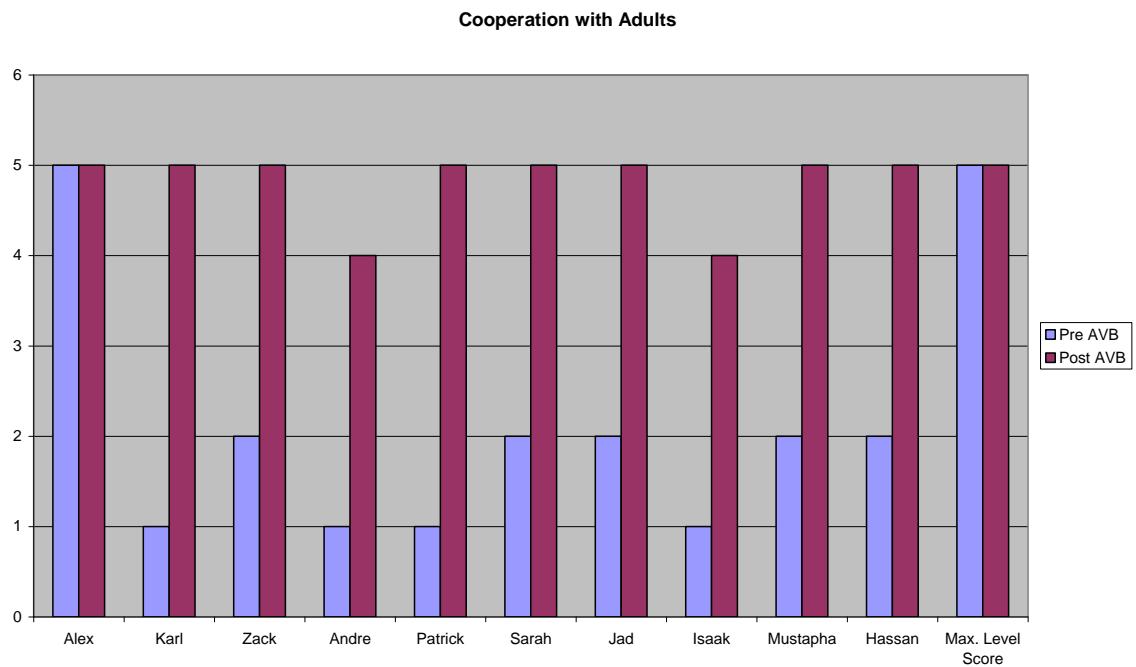
Figure (5.9) Cooperation with adults

Figure (5.9) indicates that the children have shown significant progress in their cooperation with others with less disruptive behaviours. All the children had reached the ceiling scores of this assessment (level 5) except for Andre and Isaac who reached level 4.

5.4.2 Make requests:

1. Cannot ask for reinforcers, or engages in negative behaviour.

2. Pulls people, points, or stands by reinforcing items.

3. Uses 1-5 words, signs, or pictures to ask for reinforcers.

4. Uses 5-10 words, signs or pictures to ask for reinforcers.

5. Frequently requests using 10 or more words, signs or pictures.

Requests (Mands) Pre & Post AVB Intervention
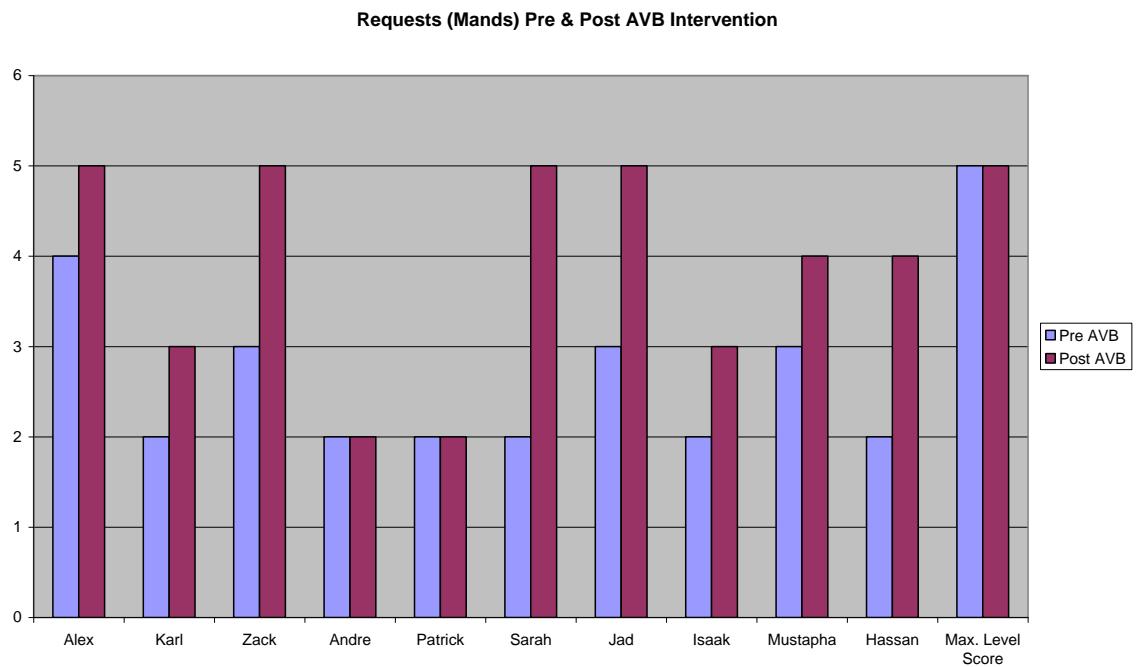
Figure (5.10)   Requests

Figure (5.10) indicates that some children have shown considerable progress in their performance in the area of requesting and communicating their needs after the implementation of the AVB Programme for example, Alex, Zack, Sarah and Jad were frequently requesting things using either words or signs and reached (level 5). Mustapha and Hassan were using more words to communicate their needs and moved to level 4. While Karl and Isaac have learned to use signs and pictures to communicate their needs, instead of just pulling others' hands. While Andre and Patrick kept requesting what they wanted by pulling others' hands or by standing next to the required item.

5.4.3 Motor Imitation:

1. Cannot imitate anybody's motor movement.

2. Imitates a few gross motor movements modelled by others.

3. Imitates several gross motor movements on request.

4. Imitates several fine and gross motor movements on requests.

5. Easily imitates fine or gross movements, often spontaneously.

Figure (5.11) clearly indicates the progress the children have shown in their performances after the implementation of the AVB programme in the Motor Imitation programme. Analysing the pre & post AVB scores, all the children can easily imitate fine and gross motor movements and reaching level 5 with exception of Sarah who has reached level 4. As for Patrick and Isaac they

were able to reach level 3, while Andre was able to reach level 2 which allow

him to imitate few gross motor movements where he could not imitate any

movements before the AVB intervention.

Motor Imitation Pre & Post AVB Intervention
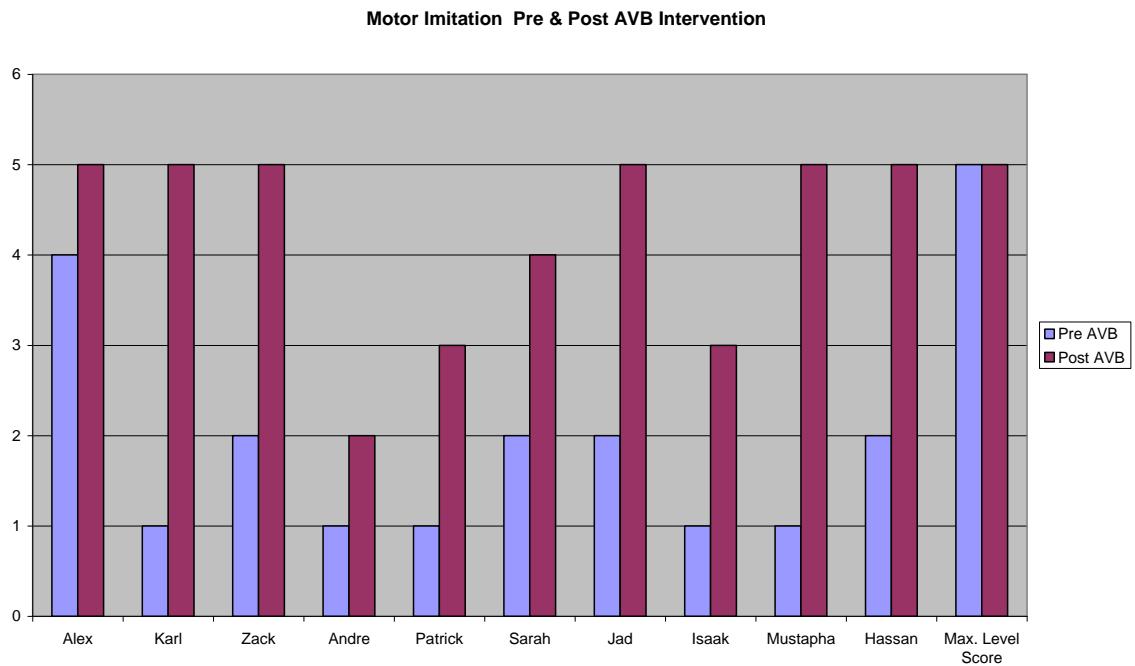
Figure (5.11)   Motor Imitation

5.4.4 Vocal Play

1. Does not emit any sounds.

2. Makes a few speech sounds at a low rate.

3. Babbles many speech sounds with varied intonations.

4. Babbles frequently with varied intonation and says a few words.

5. Babbles frequently and says many clearly understandable words.

Analysing figure (5.12) vocal play pre & post AVB programme, it clearly shows that four children: Alex, Jad, Mustapha and Hassan has reached level 5 and they were able to say many understandable words while Zack and Sarah has reached level 4 and they were able to say few words. Karl and Patrick has reached level 3 where they were able to babble many speech sounds while Andre and Isaac has just started to making few speech sounds where they were able to reach level 2.

Vocal Play Pre & Post AVB Intervention
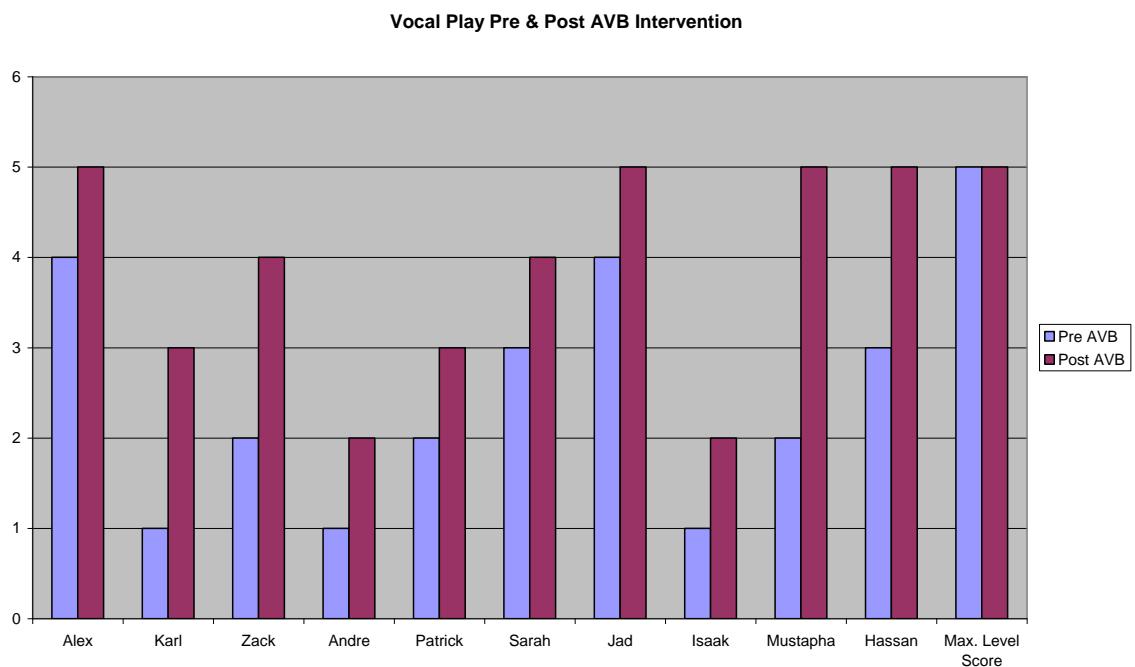
Figure (5.12)   Vocal Play

5.4.5   Vocal Imitation (Echoic):

    1.   Cannot repeat any sounds or words.

    2.   Will repeat a few specific sounds or words.

3. Will repeat or closely approximate several sounds or words.

4. Will repeat or closely approximate many different words.

5. Will clearly repeat any word, or even simple phrases.

Analysing figure (5.13) Vocal Imitation pre & post AVB intervention, it clearly shows that only two children Alex and Mustapha were able to reach level 5 and clearly repeating any words or simple sentences, while Zack and Hassan has reached level 4 and were able to closely approximate many different words. As for Karl, Sarah and Jad, they were able to reach level 3 and repeat approximation of sounds and words. Andre, Patrick and Isaac were able to repeat few sounds not words therefore they scored level one.

Vocal Imitation (Echoic) Pre & Post AVB Intervention
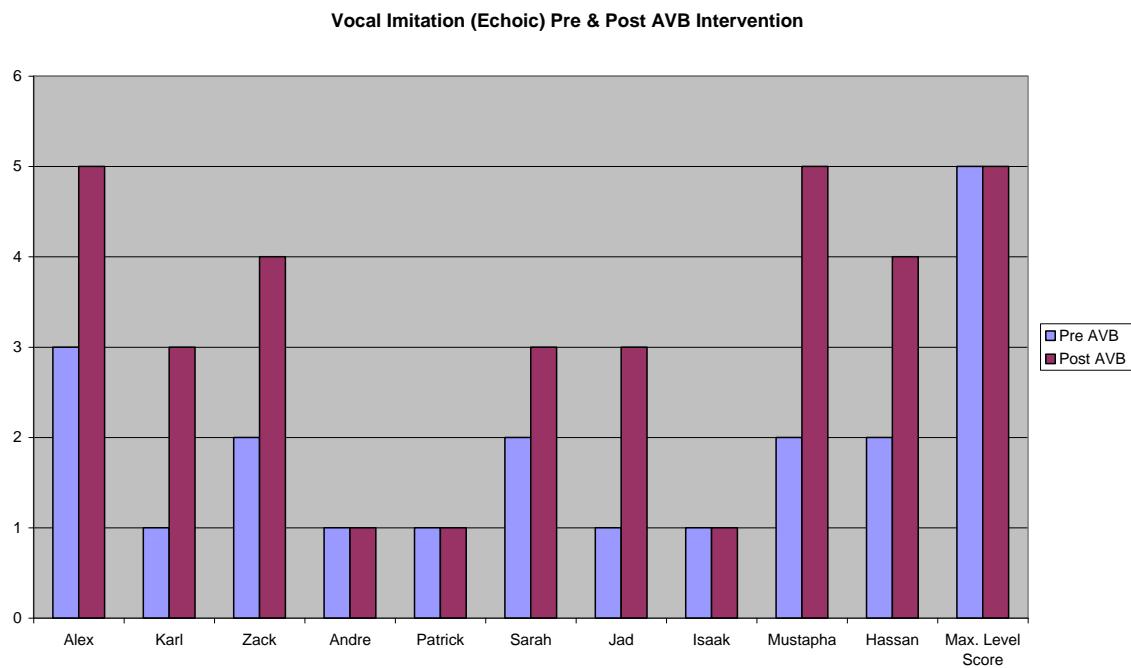
Figure (5.13)   Vocal Imitation

5.4.6 Match objects to sample.

1. Cannot match any objects or pictures to sample.

2. Can match 1 or 2 objects or pictures to a sample.

3. Can match 5 to 10 objects or picture to a sample.

4. Can match 5 to 10 colours, shapes, or designs to a sample.

5. Can match most simple items and match 2 to 4 block designs.

Analysing figure (5.14) Matching objects to sample pre & post AVB intervention, it clearly indicates that six children have reached level 5 and they can match most simple items. The reader is reminded that Alex had scored level 5 in pre & post AVB intervention. Patrick and Sarah has reached level 4 and they were able to match colours, shapes and designs to a sample, while Andre and Isaac were able to reach level 3 and match objects or pictures to a sample where they could not match any objects prior to the AVB intervention.
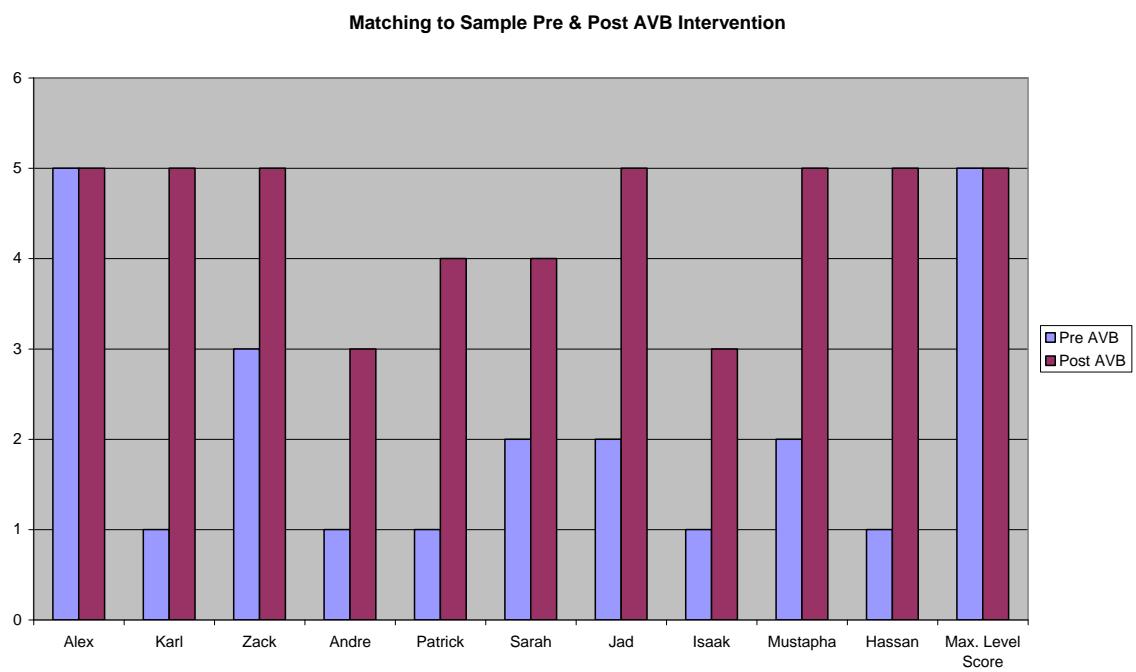
Figure (5.14)   Matching to sample

5.4.7 Receptive Language.

1. Cannot understand any words.

2. Will follow a few instructions related to daily routines.

3. Will follow a few instructions to do actions or touch items.

4. Can follow many instructions and point to at least 25 items.

5. Can point to at least 100 items, actions, persons, or adjectives.
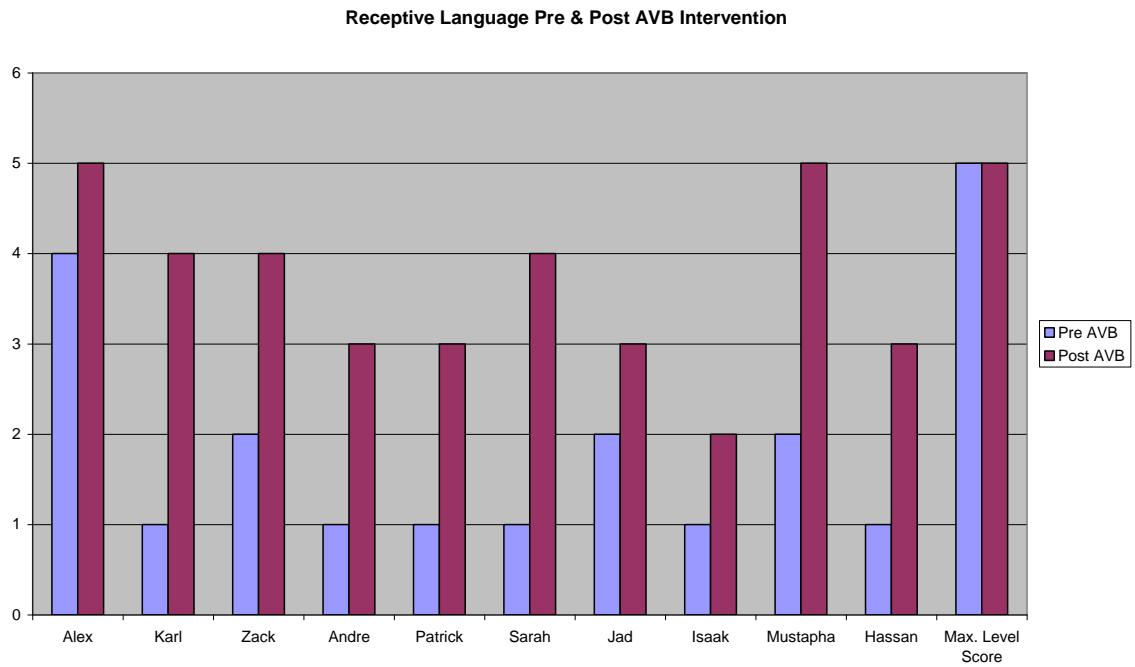
Figure (5.15)   Receptive Language

Analysing figure (5.15) receptive language pre & post AVB intervention, it clearly indicates that two children (Alex and Mustapha) were able to reach level 5 and shows understanding of receptive language and follow more complex directions, while 3 children (Karl, Zack and Sarah) were able to reach level 4 and follow many instructions and point to some items. Andre, Patrick, Jad and Hassan were able to reach level 3 and follow few instructions to do actions comparing to not following any instruction before the AVB intervention. While Isaac was able to reach level 2 follow few instructions which related to daily routines.

5.4.8 Labelling (Tacts): Label items and actions (nouns and verbs).
1. Cannot identify any items or actions.

2. Identifies only 1 to 5 items or actions.

3. Identifies 6 to 15 items or actions.

4. Identifies 16 to 50 items or actions.

5. Identifies over 100 items or actions and emits short sentences.

Analysing figure (5.16) labelling pre & post AVB intervention, it clearly indicates that Alex had scored level 5 pre and post AVB intervention while Mustapha was able to reach level 5 and identifies over 100 items/actions and emits short sentences while he was only able to identify 15 items pre- AVB intervention. Zack was able to reach level 4 and identifies more than 50 items while he used to identify 1 item and 1 action pre- AVB intervention. Karl, Sarah and Jad were able to reach level 3 and identify more than 15 items where they did not identify any items as pre AVB intervention. Hassan was able to reach level 2 and identify 5 items and actions. Andre, Patrick and Isaac were not able to expressively identify any items or actions.
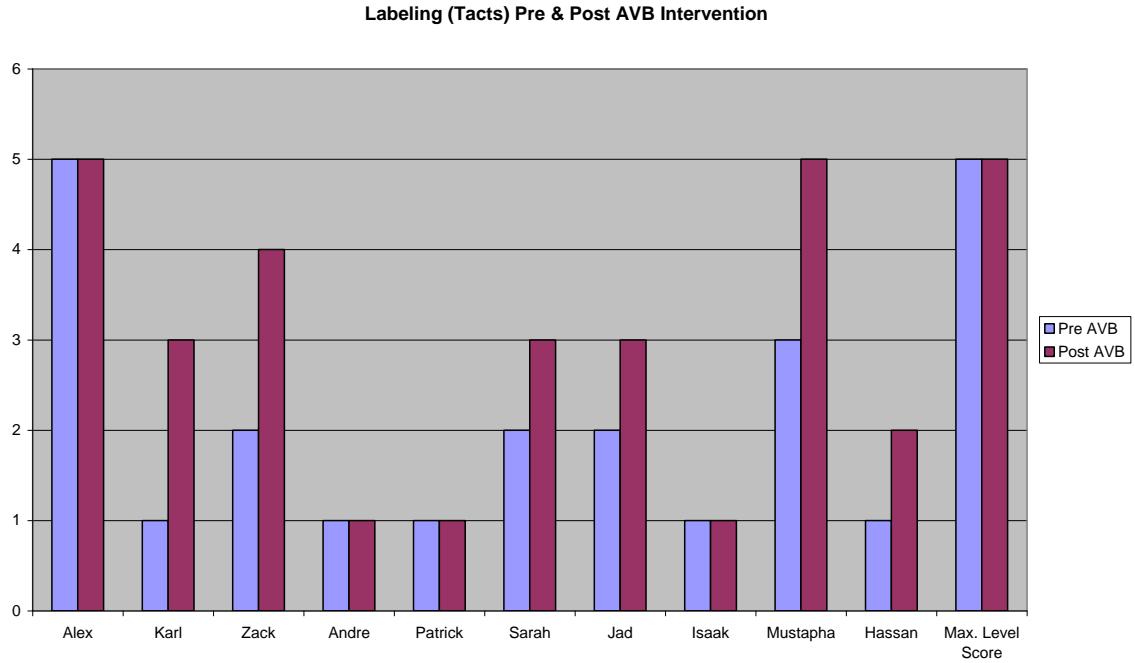
Figure (5.16)   Labelling

5.4.9 Receptive by feature, function, class.

1. Cannot identify items based on information about them.

2. Will identify a few items given synonyms or common functions.

3. Will identify 10 items given 1 of 3 functions or features.

4. Will identify 25 items given 4 functions, features or classes.

5. Will identify 100 items given 5 functions, features or classes.

Analysing figure (5.17) receptive by feature, function and class pre & post

AVB intervention, it clearly indicates that only two children have shown an

improvement in this area. Alex was able to reach level 5 and identify over 100

items given 5 functions, features and classes. While Zack was able to reach

level 3 and identify more than 10 items given 1 function and feature of each

item (e.g. the function of a car is to ride it and one of its features it has

wheels), where he was not able to identify items based on information given

about them.

Receptive by Function, Feature, and Class
Pre & Post AVB Intervention
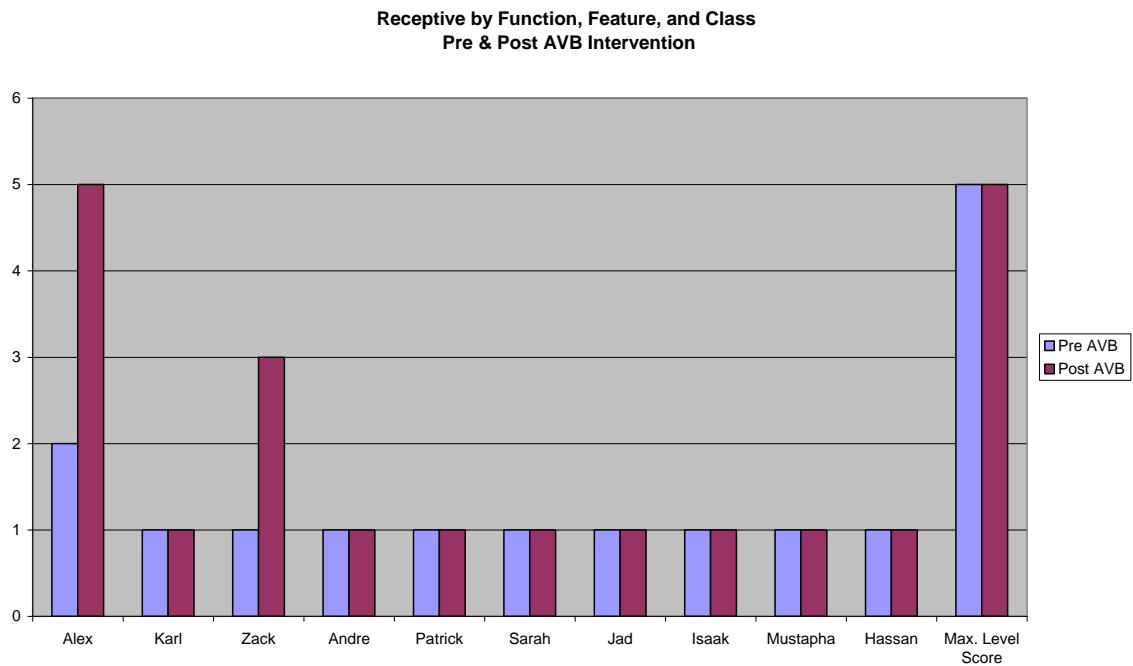
Figure (5.17)   Receptive by function, feature and class

5.4.10 Conversational skills:

1. Cannot fill- in missing words or parts of songs.

2. Can fill-in a few missing words or provide animal sounds.

3. Can fill-in 10 reinforcing phrases or answered at least 10 simple

   questions.

4. Can fill-in 20 phrases or can answer 20 questions with variation.

5. Can answer at least 30 questions with variation.

Analysing figure (5.18) conversational skills pre & post AVB intervention, it indicates that only few children have shown an improvement in this area. Alex was able to reach level 5 in post AVB while he scored level 2 pre- AVB, being able to provide few animal sounds to answering more than 30 questions with different variation. Mustapha was able to reach level 3 and answers few simple questions where he could not fill in any missing words or parts of songs before the AVB intervention .While, Karl, Zack, Sarah and Hassan were able to reach level 2, they were able to fill in few missing words and providing animal sounds.

Conversational Skills Pre & Post AVB Intervention
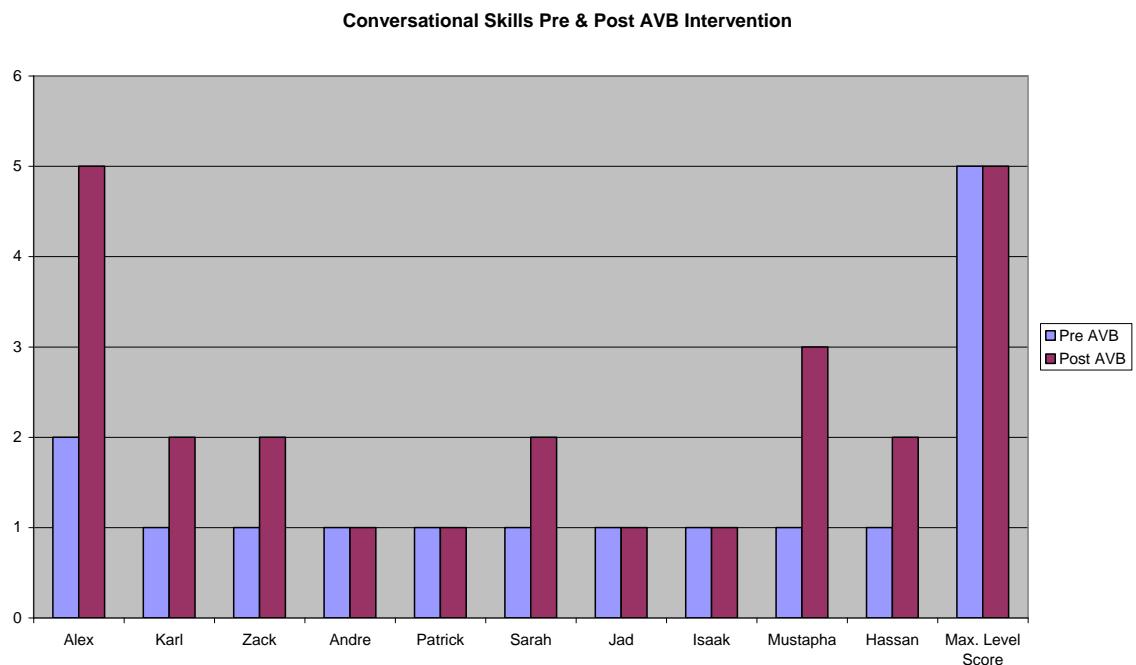
Figure (5.18)   Conversational skills

5.4.11 Know letters and numbers:

1. Cannot identify any letters, numbers, or written words.

2. Can identify at least 3 letters or numbers.

3. Can identify at least 15 letters or numbers.

4. Can read at least 5 words and identify 5 numbers.

5. Can read at least 25 words and identify 20 numbers.

Letters and Numbers Pre & Post AVB Intervention
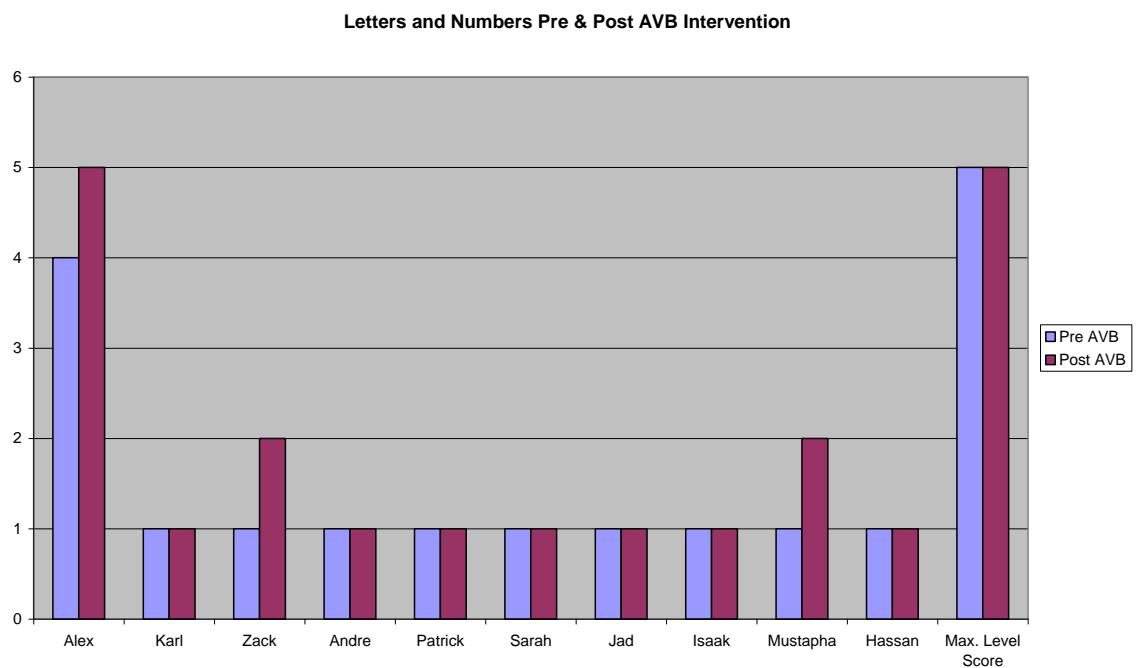
Figure (5.19)   Letters and numbers

Analysing figure (5.19) identifying letters and numbers pre & post AVB

intervention, only three children have shown an improvement in this area.

Alex were able to reach level 5 and read more than 100 words, simple

sentences and identify 100 numbers while he was able to read few words and

identify numbers pre- AVB intervention. Zack and Mustapha were able to

reach level 2 and identify more than 10 letters and numbers where they could

not identify any letters or numbers pre- AVB intervention.

5.4.12 Social interaction:

1. Does not initiate interactions with others.

2. Physically approaches others to initiate an interaction.

3. Readily asks adults for reinforcers.

4. Verbally interacts with peers with prompts.

5. Regularly initiates and sustains verbal interactions with peers.

Social Interaction Pre & Post AVB Intervention
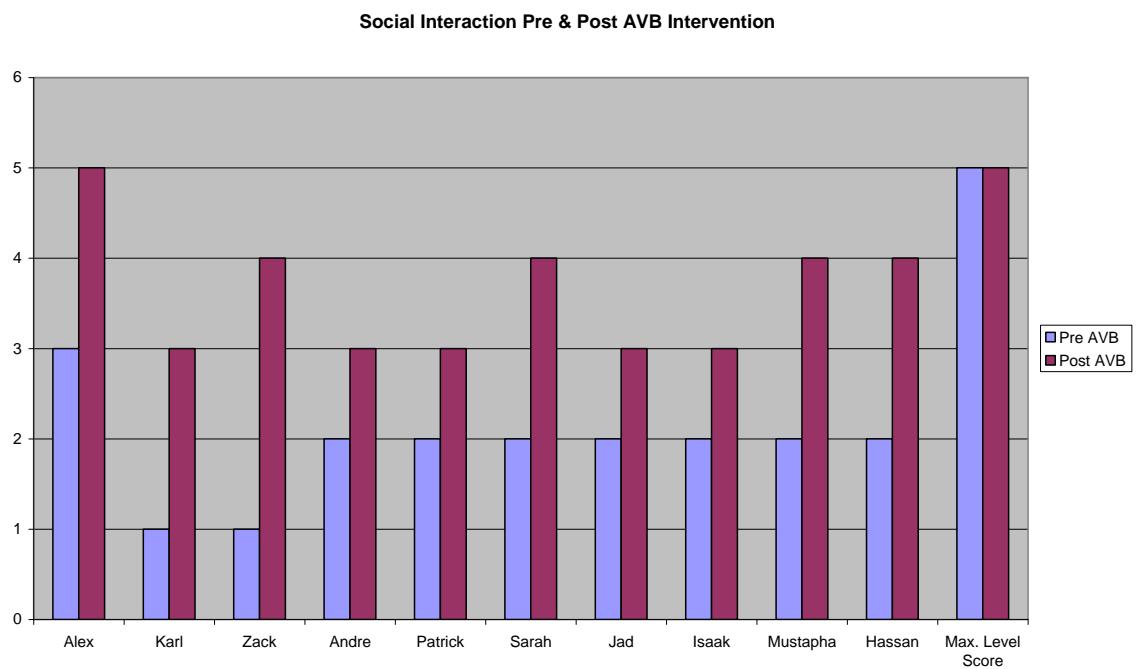
Figure (5.20) Social Interaction

Analysing figure (5.20) social interaction pre & post AVB intervention, it clearly indicates that all the children have shown a noticeable improvement in this area. Alex was able to reach level 5 and regularly initiates and sustains verbal interactions with adults and peers where he was functioning at level 3 pre AVB intervention. Zack, Sarah, Mustapha and Hassan were able to reach level 4 and verbally interact with others where Sarah Mustapha and Hassan were functioning at level 2 pre AVB intervention and Zack did not initiate any social interaction. The other five children were able to reach level 3 and readily interact with adults and ask for desired reinforcers while pre – AVB intervention they were just able to physically approach adults and peers to initiate interaction.

The Average BLAF Scores Pre & Post AVB Intervention
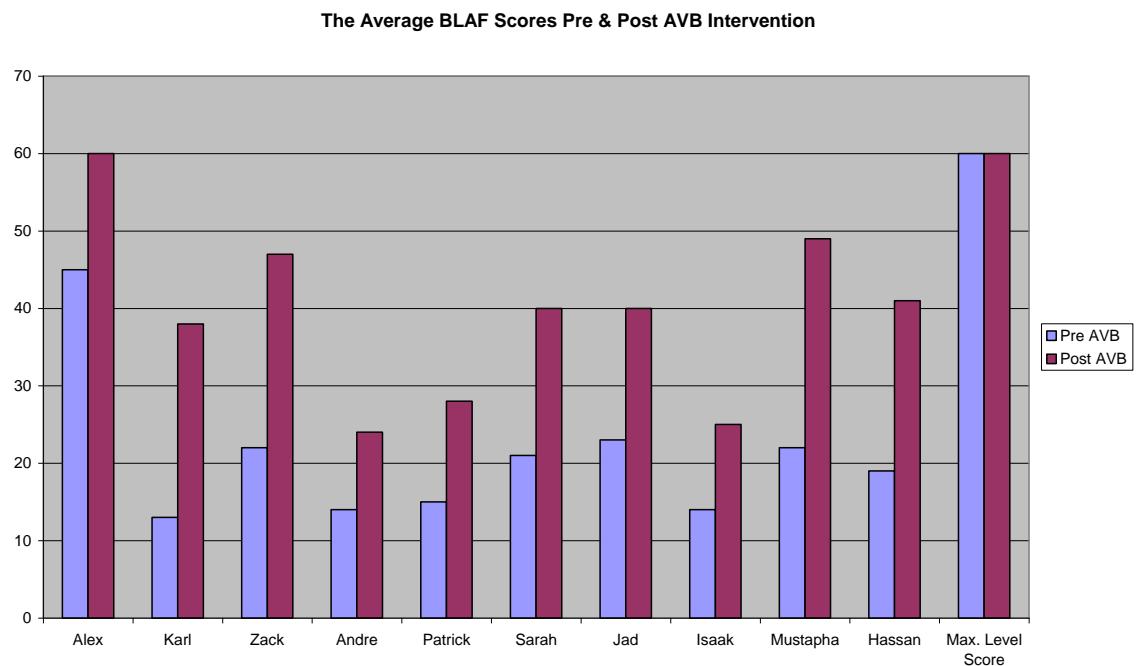
Figure (5.21) The Average BLAF scores pre& AVB intervention

The figure (5.21) shows that some children improved noticeably and scored high scores while others had improved but scored fewer points.

Names of Children	Period of attendance in Days	Pre AVB	% Pre	Post AVB	% Post	% Rate of Improvement
Alex	293	45	75	60	100	25
Karl	305	13	21.66	38	63.33	41.67
Zack	279	22	36.66	47	78.33	41.67
Andre	148	14	23.33	24	40	16.67
Patrick	139	15	25	28	46.66	21.66
Sarah	120	21	35	40	66.66	31.66
Jad	142	23	38.33	40	66.66	28.33
Isaac	142	14	23.33	25	41.66	18.33
Mustapha	123	22	36.66	49	81.66	45
Hassan	137	19	31.66	41	68.33	36.67
Max. Level Score	310	60	100	60	100	100

**Figure (5.22) BLAF's Percentage of Improvement Out of Maximum Score
High Score Indicates Improvement in Skills**

For percentage of rate of improvement of each child see figure (5.22). For example, Alex improved noticeably and scored the maximum 60 points which means an improvement by 15 points (25%) post AVB which allowed him to reach the ceiling scores of this test. While Mustapha had improved by 27 points (45%) but he still needed 11 points to reach the ceiling scores. Karl and Zack both had improved by 25 points (41.67%), Hassan had improved by 22 points (36.67%). Sarah had improved by 19 points (31.66%), Jad had

improved by 17 points (28.33%). only three children although improved, their improvement was not as significant as the rest, for example Patrick improved by 13 points (21.66%), Isaac improved by 11 points (18.33%) And Andre improved by 10 points (16.67%).

In summary, the majority of the children have shown significant improvement in the entire programme comparing the pre & post intervention scores. However, Andre, Patrick, and Isaac have shown moderate improvements.

5.5 The Assessment of Basic Language and Learning Skills (The ABLLS) by Sundberg & Partington (1998)

The ABLLS is an assessment, curriculum guide, and skills tracking system for children with language delays. The ABLLS contains a task analysis of the many skills necessary to communicate successfully and to learn from everyday experiences. High scores indicate progress and better outcomes. (For more information, refer to Chapter 4). The reader is advised that the numbering of the ABLLS' items sections below is in the same order as it was originally set up by Partington & Sundberg (1998) (see Appendix R).

5.5.1 Basic Learner Skills Section

The basic learner skills section is a strategy which is used to teach the children skills which will allow them to learn additional skills without the need for highly specialised instruction. Therefore, a curriculum should emphasize teaching a child a set of basic learner skills such that he will "learn to learn" (Partington and Sundberg, 1998).

The basic learner skills section is comprised of 15 important skill areas (from the cooperation and reinforcer effectiveness programme to the generalized responding programme), which may appear critical in order to learn from everyday experiences. Most of the skills contained in Basic Learner Skills Section are ones that most typically – developing children would have acquired by the end of kindergarten, *"these skills represent a reasonable, age based target for young children who are in early intervention programs, while also continuing to provide important educational goals for older children". (The ABLLS Guide, Partington, Sundberg, 1998, p. 16)*

a) Cooperation and Reinforcer Effectiveness

Many children with autism are unwilling to cooperate with request made by others. As for the Co-operation and Reinforcer Effectiveness programme, the children have made significant progress as shown in figure (5.23). This programme involves teaching the children to respond to instructor controlled reinforcers, the children would work for a variety of items and activities as reinforcement, the children will respond to social reinforcers and wait appropriately if reinforcer delivery is delayed. Although Alex had only improved by 3 points he had scored 30 out of 30 which is the maximum score. Jad had improved by 28 points; Karl and Patrick had improved by 25 points; Andre, Sarah and Hassan had improved by 24 points; Isaac and Mustapha had improved by 23 points; and Zack had improved by 7 points.
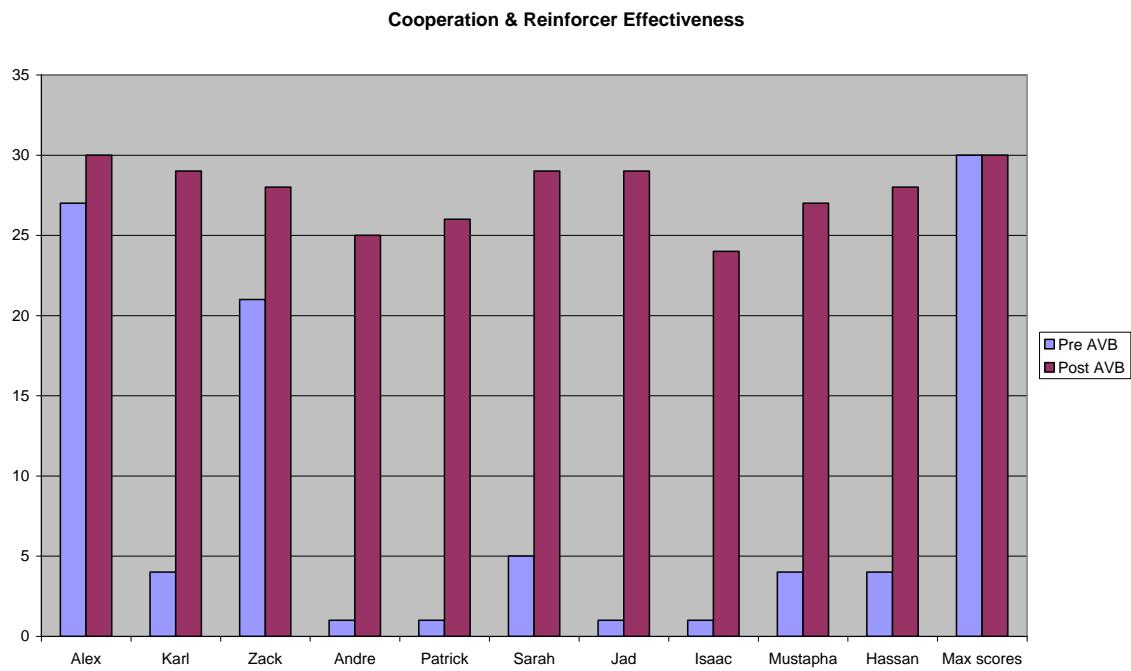
Figure (5.23) Cooperation with Adults

b) Visual Performance

As for the Visual Performance programme, most of the children have made significant improvement as shown in figure (5.24) while few of them have shown minor to moderate improvement. The ability to match pictures, designs and shapes to identical samples often reveals a number of important abilities (Sundberg & Partington, 1998). "A child who attends to visual stimuli, discriminate between differing stimuli, and emit specific motor behaviours to complete a task. This type of task is often seen on IQ tests and is frequently discussed by psychologists as a measure of cognitive ability" (Sundberg, 1998, p. 24) Alex had improved by 21 points and had scored 73 (out of 76 max. score) as post intervention. Karl had improved by 53 points, although he scored 0 as pre AVB intervention; Jad had improved by 48 points despite the fact that he scored 0 as pre AVB

intervention; Mustapha had improved by 42 points; Zack had improved by 35 points; Hassan had improved by 32 points, although he scored 0 as pre AVB intervention;; Sarah had improved by 29 points; Isaac had improved by 16 points while Patrick had improved by 14 points and Andre had improved by 6 points despite the fact that all of them had scored 0 as pre AVB intervention.

Visual Performance
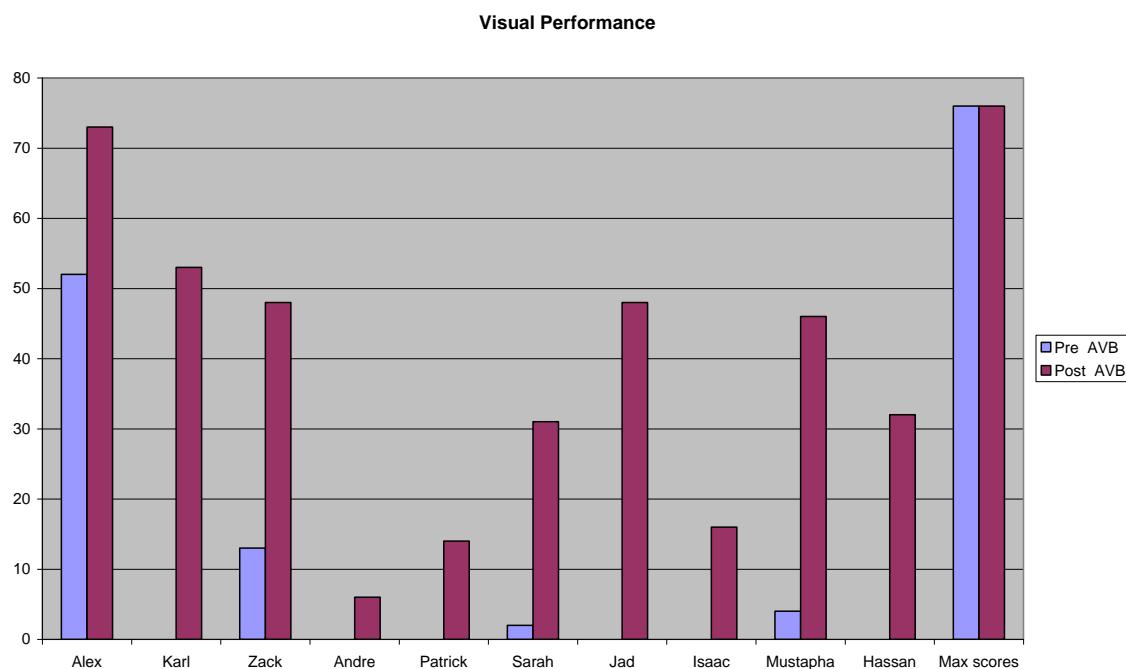
Figure (5.24) Visual performance

c) Receptive Language

The objective of the Receptive Language Programme is to enable the children to understand and act upon specific words or phrases, to follow simple instructions and directions. *"Receptive Language is almost always in need of development even for children who have strengths in this area compared to other language area".* (The ABLLS Guide, 1998, p. 22). This programme involves teaching the child to follow

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simple directions, selecting a named item from a simple display of items, later on, teaching the child to follow more complex directions and to identify greater number of items. Teaching the child to learn complex receptive discrimination with verbs, adjective-noun combinations, teaching the child to receptively identify items when told something about the item (i.e. receptive by function, feature or class) prepositions, etc…

Receptive Language
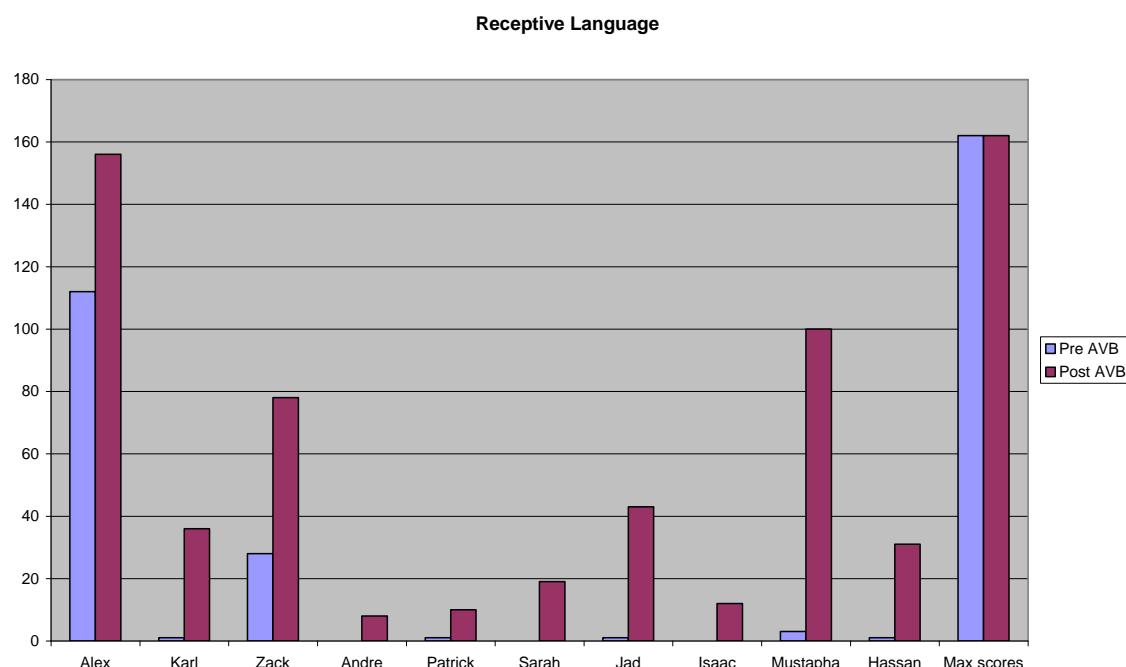
Figure (5.25) Receptive Language Programme

As for the Receptive Language programme, as it is shown in figure (5.25), some children have made significant progress such as Alex who had improved 44 points and had scored 156 post intervention out of 162 max score; Mustapha had improved by 97 points; Zack had improved by 50 points; Jad had improved by 42 points; Karl had improved by 35 points; Hassan had improved by 30 points, Sarah had improved by 19 points. The

following children have made some progress such Isaac who had improved by 12 points, Patrick who had improved by 9 points and Andre had improved by 8 points.

d) Imitation

The objective of Motor Imitation programme is to enable the children to have well developed and generalized imitative repertoire. It involves teaching the children to imitate motor activities using an object, imitation of body movements including gross, fine, oral and head movements.

As for the Imitation programme, as it is shown in figure (5.26), some children have made significant progress such as Alex who had scored 45 out of 46 and improved by 5 points; Hassan had improved by 40 points; Zack had improved by 35 points; Mustapha had improved by 32 points; Karl had improved by 28 points; while rest of the children have made some improvement such Jad who had improved by 15 points, Sarah had improved by 12 points, Patrick had improved by 11 points, Isaac had improved by 8 points, and Andre had improved by 7 points.
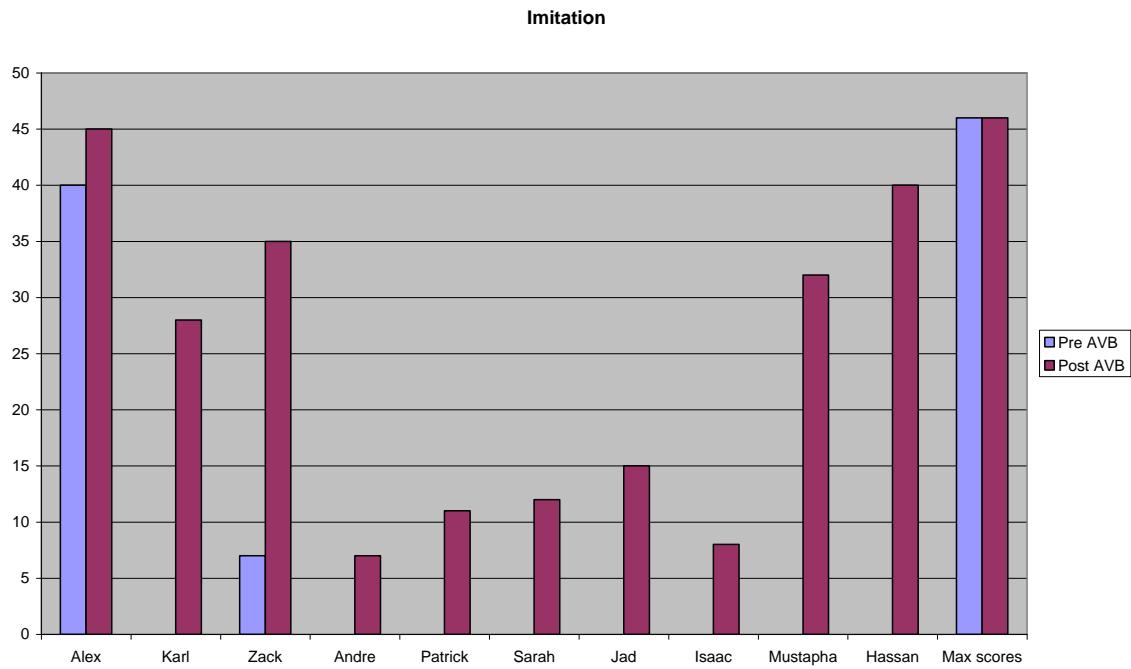
Figure (5.26) Imitation Programme

e) Vocal Imitation

The objective of the Vocal Imitation Programme is to improve vocal imitation for the children with some speech with the objective of improving articulation or the variation in volume, tone, or the speed of the child's speech (i.e., prosody). As for the non verbal children, the focus of vocal imitation was to target head and mouth imitation in addition to target simple vocalization or babbles of sounds. The Vocalisation programme, as it is shown in figure (5.27) the children have made some improvement. Alex had scored 29 out of 36 and had improved by 6 points; Mustapha had improved by 18 points, Hassan had improved by 15 points, Zack had improved by 10 points, Jad had improved by 7 points, Karl had improved by 6 points, Sarah had improved by 3 points while Andre, Patrick and Isaac did not show any improvement in this area.
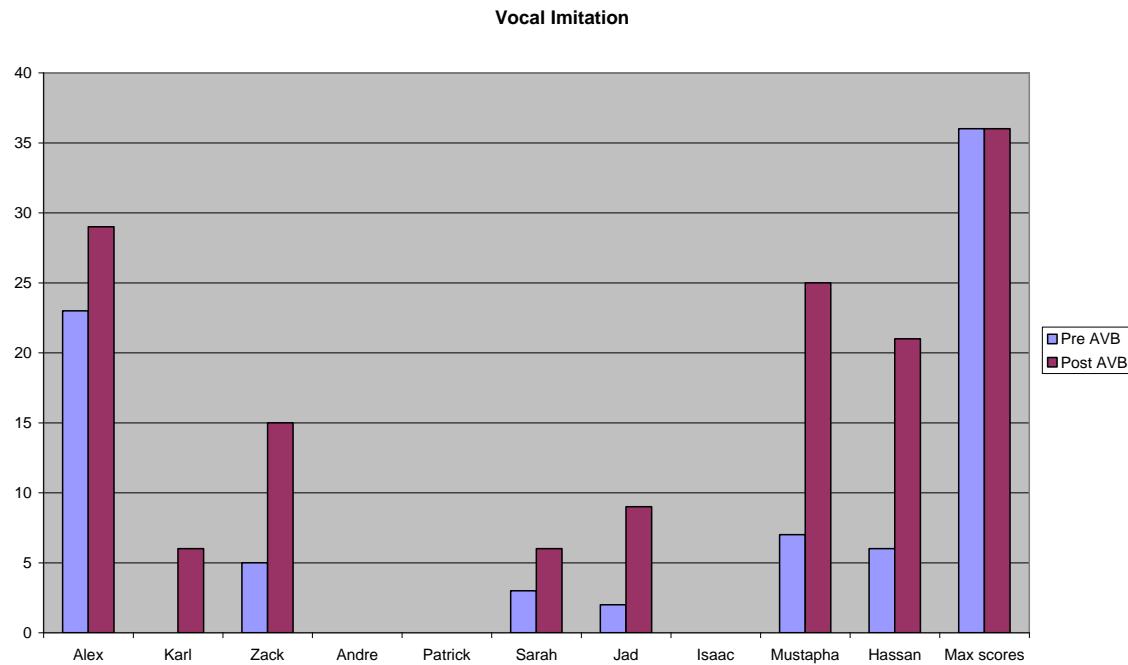
Vocal Imitation

Figure (5.27) Vocal Imitation Programme

f) Request

Most children with language delays need to improve their ability to request reinforcers and information (Sundberg, Partington, 1998). Children can request using words, signs or pictures. The objective of this programme is to teach the children to ask for several items or activities, to teach them to spontaneously ask for a variety of items and activities, to ask for missing items, for information, and for items from peers and adults etc…
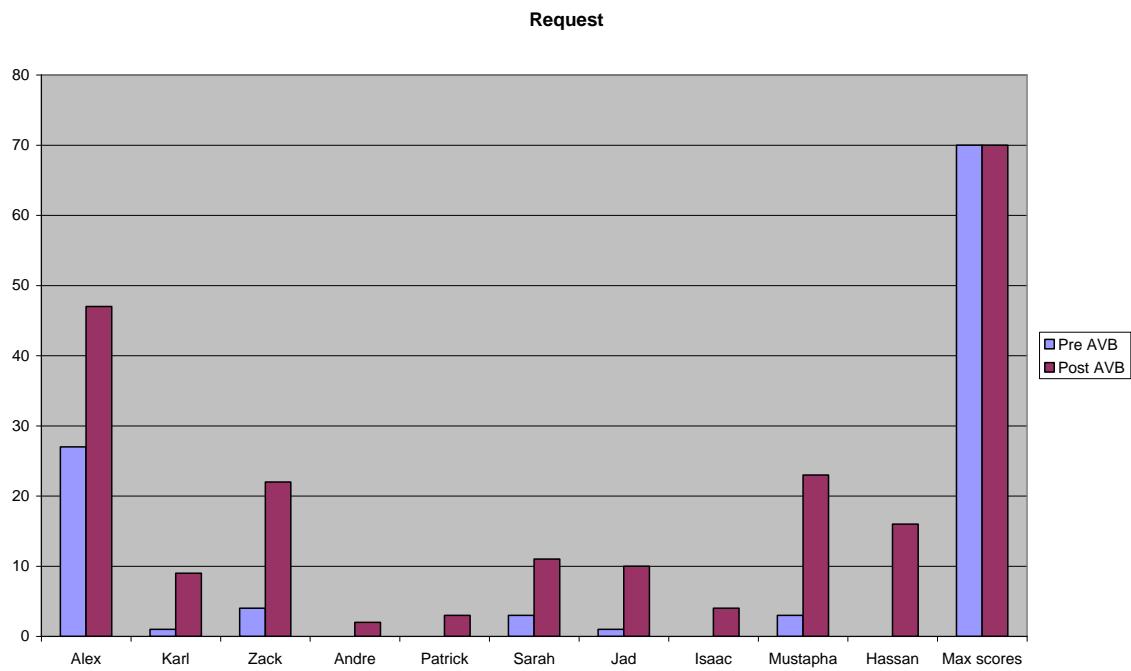
Request

Figure (5.28) Request Programme

Figure (5.28), represents the improvement of the children. Some children have shown considerable improvement such as Alex who had improved by 20 points and scored 47 post AVB intervention; Mustapha had improved by 20 points; Zack had improved by 18 points; Hassan had improved by 16 points; the rest of children have shown minor improvement such as Jad who had improved by 9 points; Karl and Sarah had improved by 8 points; Isaac had improved by 4 points; Patrick had improved by 3 points while Andre had improved by 2 points only.

g) Labelling

Labelling skills are always in need of development even for children who have strengths in this area (The ABLLS Guide, 1998). This programme begins with teaching the

children to label reinforcers or common items and later it involves teaching the children more complex labelling skills including actions, body parts, adjectives, nouns, verbs, pronouns, prepositions, labelling function, feature and class of an item, labelling using carrier phrase, labelling emotions etc.. Figure (5.29) shows that only few children had made some progress, Alex had scored 82 (post-intervention) and had improved by 39 points; Mustapha had improved by 21 points and Zack had improved by 11 points; Jad had improved by 4 points; Karl had improved by 3 points; while Sarah and Hassan had improved by 1 point only.
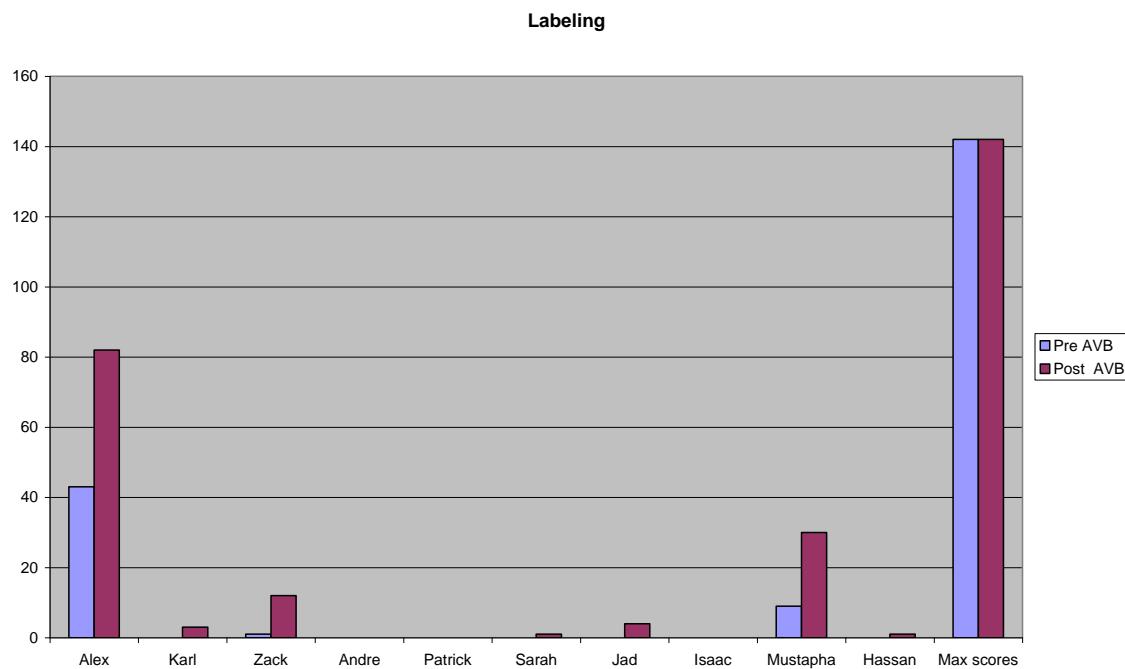
Labeling

Figure (5.29) Labelling Programme

h) Intraverbals

Intraverbals behaviour is a type of expressive language where a word or phrase evokes another word or phrase, but the two do not match each other, if the words did match they would be an example of echoic language (Sundberg, Partington, 1998). For example, a child's tendency to say "star" when someone says "Twinkle Twinkle little ….." is an Intraverbals relation. The first phrase, "Twinkle Twinkle little …" evokes but do not match, the second response "star". The objective of teaching Intraverbals skills are usually appropriate for vocal children who can request at least few items or activities and have some labelling and receptive language skills.

However, for non verbal children who are learning to request, the use of sign language is applied. The Intraverbals programme involves fill- in missing words or part of songs from songs, provide the sounds of animals, answering novel questions, telling stories, etc… these conversational language skills are important for social interaction, as well as for the acquisition of academic skills. Children are taught to answering questions and participating in meaningful conversations.
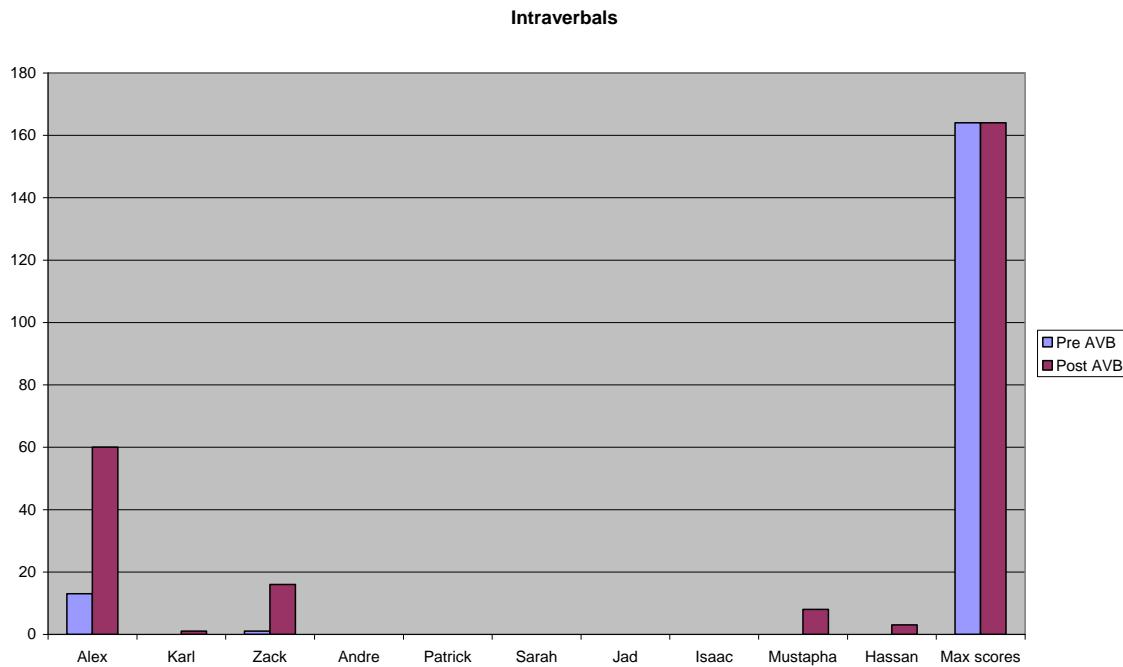
Figure (5.30) Intraverbals Programme

As for the Intraverbals programme, as it is shown in figure (5.30), only few children made some improvement in post AVB intervention and Alex was the only child who made significant improvement and improved by 47 points and scored 60 post AVB intervention. Zack had improved by 15 points; Hassan had improved by 3 points; while Karl had improved by 1 point only.

i) Spontaneous Vocalisation

"Spontaneous Vocalisation often increases as a direct result of the naturally occurring reinforcement of using language" (Sundberg, Partington, 1998 p. 24). It involves spontaneous vocalisation of sounds, words, singing songs with models, spontaneous requests spontaneous labelling and conversation etc... As for the Spontaneous

Vocalisation programme, as it is shown in figure (5.31), the children have made some improvement in post AVB intervention. Alex had scored 24 (post-intervention) out of 28 (max score) and had improved by 11 points; Mustapha had improved by 12 points; Zack had improved by 10 points; Hassan had improved by 8 points; Karl and Jad had improved by 5 points; Andre, Patrick and Isaac had improved by 1 points.

Spontaneous Vocalisations
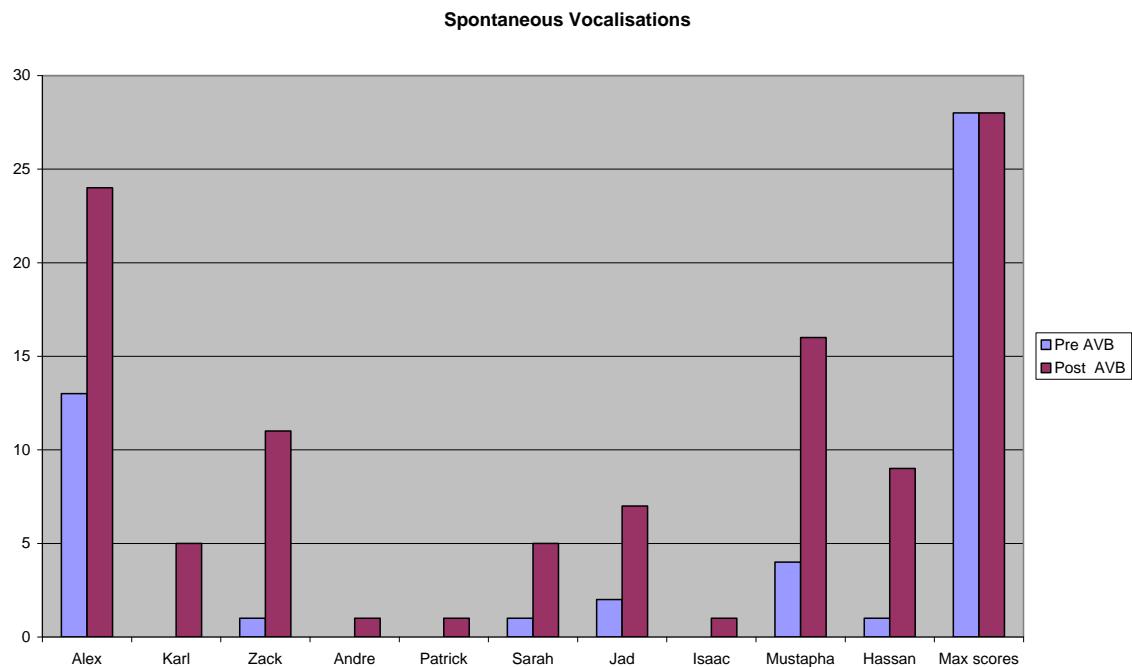
Figure (5.31) Spontaneous Vocalisation Programme

j) Syntax and Grammar

As for the Syntax and Grammar programme, all the children did not make any improvement in this area.

k) Play and Leisure

The objective of Play and Leisure programme is to increase the children's play or leisure skills, to play with toys and manipulates them as designed, to increase the variety of play and activities and the amount of time spent in play or leisure activities and to play interactively with other children etc…

As for the Play and Leisure programme, which is shown in figure (5.32), the children have made noticeable improvement in post AVB intervention. Alex had improved by 25 points and had scored 35 out of 36 (max. score). Karl had improved by 19 points while Zack had improved by 18 points, Hassan had improved by 17 points, Jad had improved by 13 points, Mustapha had improved by 12 points, Patrick and Sarah had improved by 10 points, Andre had improved by 8 points, Isaac had improved by 6 points.
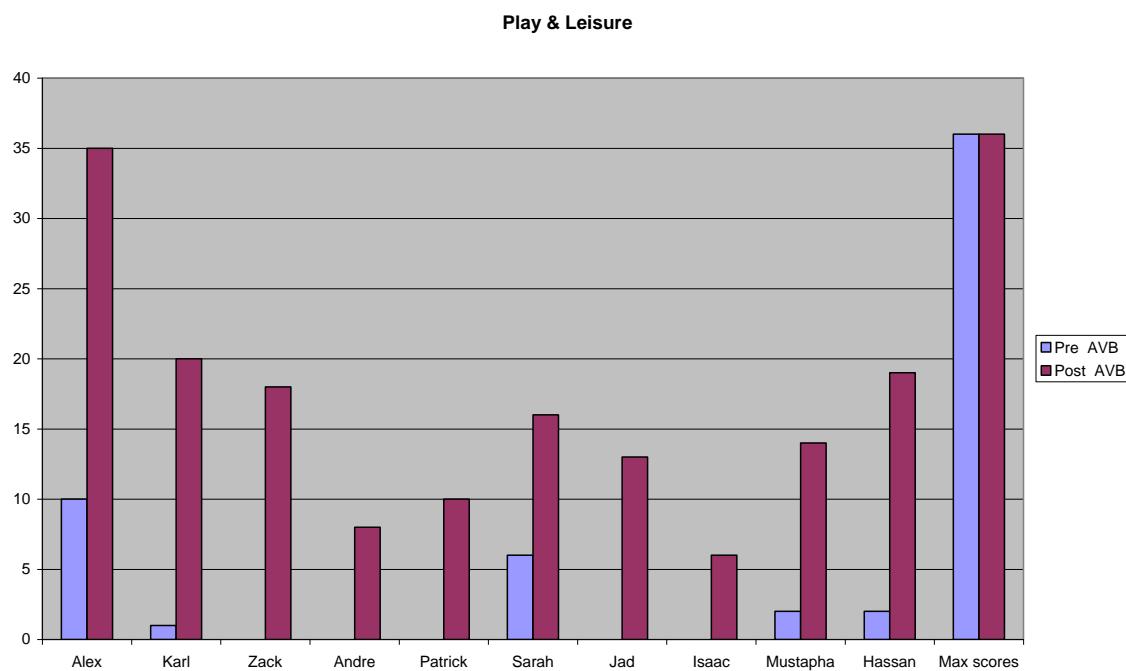
Figure (5.32) Play and Leisure Programme

l) Social Interaction

Social interaction skills are always in need of development for children with autism, regardless of their language skills. This programme involves returning greetings, turn-taking, approaching others for interactions, and giving up reinforcers, requesting items or information from peers, make offers to share, initiate greetings, and converse with others. The Social Interaction programme, as it is shown in figure (5.33), reflects the children improvement in post AVB intervention. Alex had improved by 32 points, Karl and Hassan had improved by 31 points, Zack, Jad and Mustapha had improved by 23 points, Patrick had improved by 18 points, Andre and Sarah had improved by 16 points while Isaac had improved by 11 points only.

Social Interaction
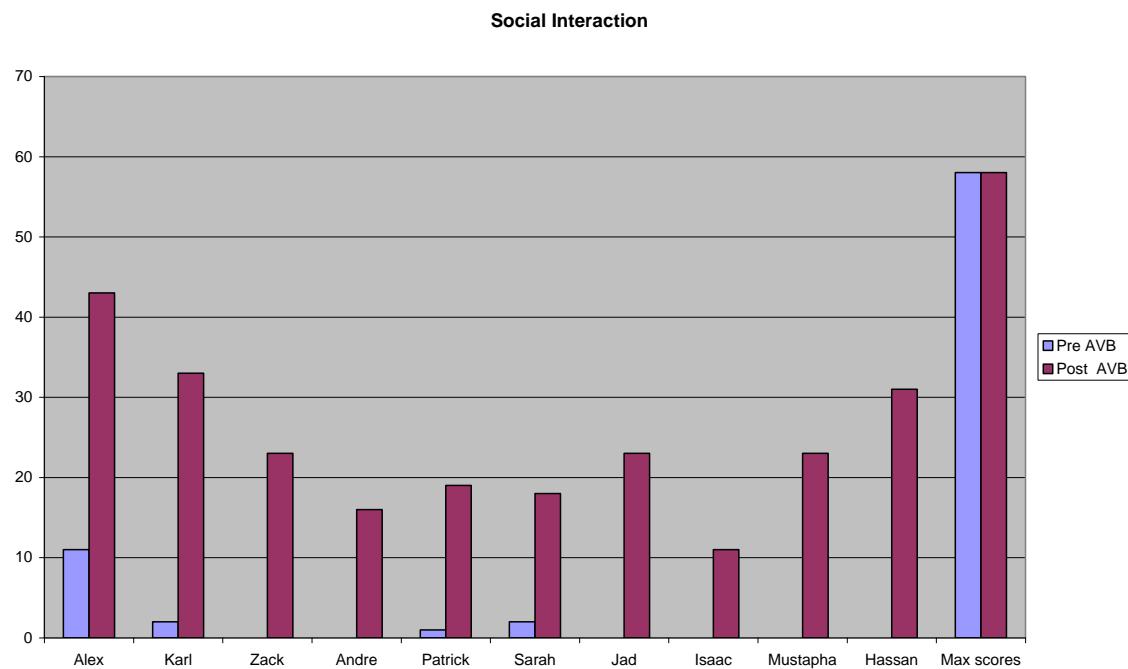
Figure (5.33) Social Interaction Programme

m) Group Instruction

The objective of Group Instruction programme is to develop the children's group-participation skills. It involves sitting appropriately in small or large group, attending to teacher or students in group, taking turns during instructions and learning new skills in group teaching format etc… The Group Instructions programme, as it is shown in figure (5.34), indicates the significant progress of the children. Alex had improved by 18 points, Karl had improved by 17 points; Zack and Jad had improved by 14 points; Sarah had improved by 10 points; Patrick and Hassan had improved by 8 points; Andre and Mustapha had improved by 7 points; Isaac had improved by 6 points.
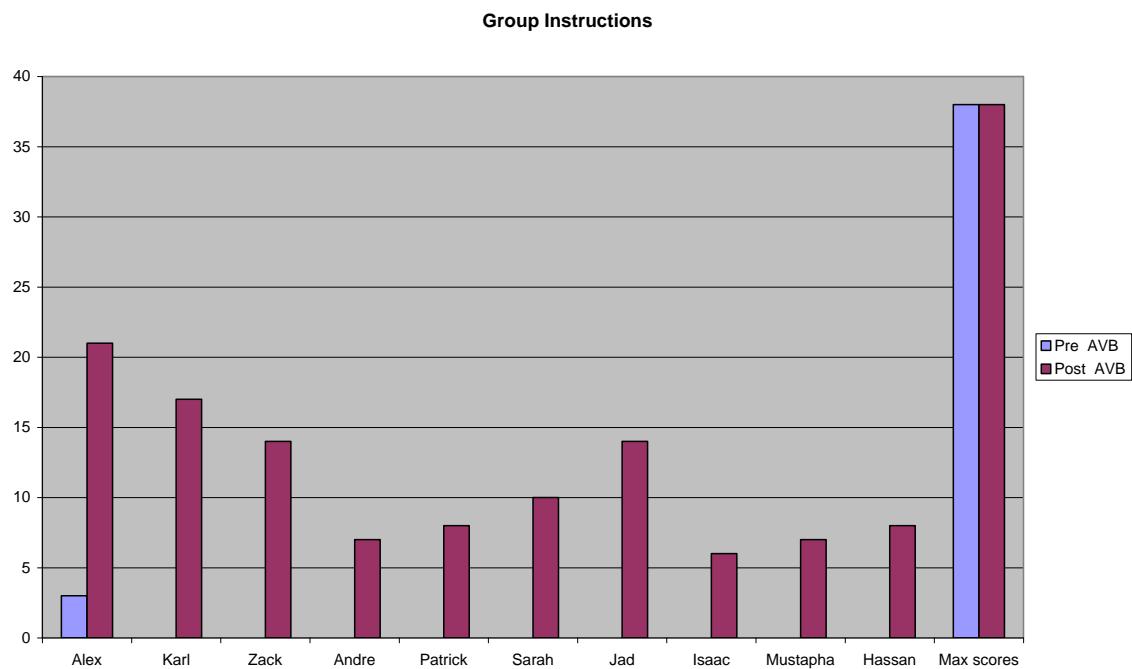
Figure (5.34)   Group Instructions programme

n) Classroom Routines

The Class-Room Routine programme teaches the children to line up on request; getting and returning own materials, completing a task and bringing it to the teacher, working independently on academic and non-academic activities and physically transitions to next area or activities without disruptive behaviours. Class-Room Routine programme, as it is shown in figure (5.35), the children have made significant improvement. Alex had improved by 15 points and post scored 21, Karl had improved by 18 points out of 24, Jad had improved by 16 points, Zack and Hassan had improved by 14 points, Sarah had improved by 9 points, Patrick had improved by 6 points, Andre had improved by 5 points while Isaac had improved by 4 points. The improvement the children have shown in this programme is significant particularly as all the children had scored 0 as pre- AVB intervention in exception to Alex who scored 6.
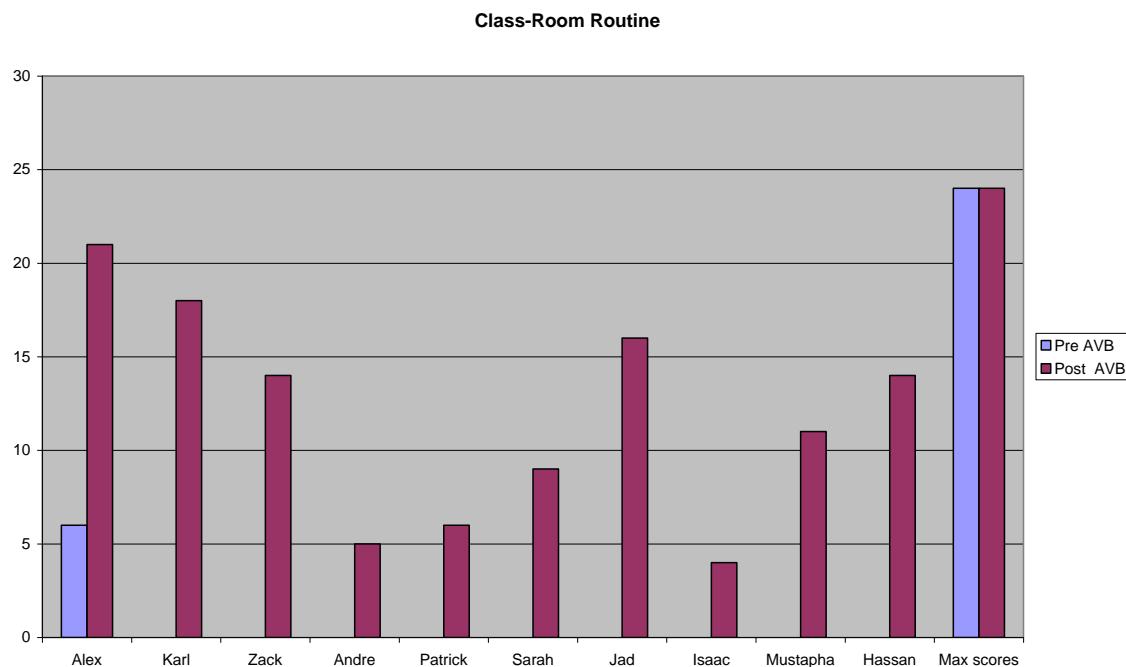
Figure (5.35) Class- Room Routine Programme

p) Generalised Responding

The generalisation of skills is standard part of the development of specific skills. This programme involves helping the children to learn to generalize the skills they have learned across instructors and across environments, using the skills in group.   As for the Generalised responding programme, the children have improved significantly in this programme as it is shown in figure (5.36). Hassan had improved by 9 points out of 12. Karl and Zack had improved by 8 points; Sarah and Mustapha had improved by 7 points; Jad had improved by 6 points; Andre and Patrick had improved by 4 points. All the mentioned children had scored 0 as pre-intervention in exception to Alex had improved 3 and post scored 10.
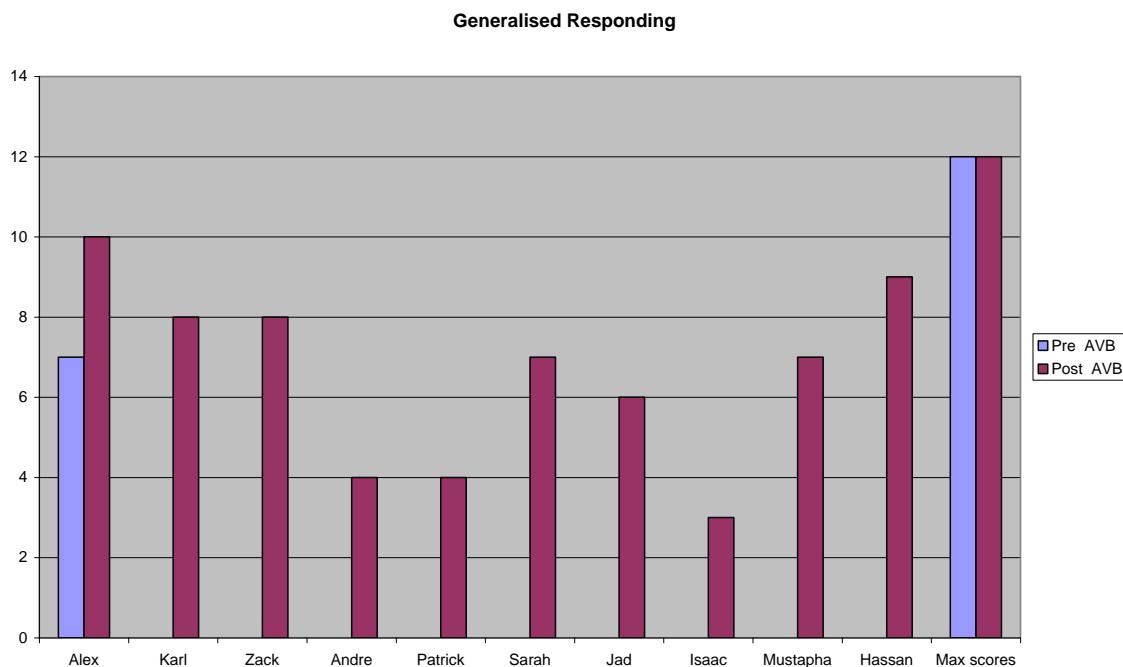
Figure (5.36) Generalised Responding Programme

To summarize the Basic Learner Skills Section, the children have made significant progress in some programme, while they showed moderate to minor progress in other programme. All the children have made significant progress in the cooperation programme, play and leisure, social interactions, group instructions, class-room routines, and generalized responding comparing to pre scores. Analyzing the data of the programme included in this section, one can see that Alex is the only child who made major improvement in the entire programme and had high scores except in the syntax and grammar programme where he and all the children did not make any progress. All the children have made significant progress in the Visual performance programme except Andre, Patrick and Isaac who made minor to moderate progress. As for the receptive language programme, imitation programme, spontaneous vocalization programme Alex, Karl, Zack, Jad, Mustapha and Hassan had made significant improvements while the rest of the children have made minor to moderate progress. As for the vocal imitation, request Alex, Zack, Mustapha and Hassan have made significant improvement while the rest made minor to moderate progress. As for the labelling programme, Intraverbals programme Alex and Mustapha had made noticeable progress while the rest had shown minor to non progress.

5.5.2 Academic Skills Section

As it was highly suggested in the ABLLS guide, many of the skills in the academic section should not be of higher priority than those in the Basic Learner Skills Section. Therefore, *"unless the child has made considerable progress in most of the areas of the Basic Learner Skills Section, or unless he already has easily learned some or has an*

interest in numbers, letters, etc.. these types of skill should be deferred to later time"

(The ABLLS Guide, 1998, p.17)

q) Reading

Reading programme involves teaching receptive and expressive letters, sounds of letters, matching words with pictures, matching individual letters to letter on word card, fill – in missing letter of words, reading simple words, reading simple sentences etc… figure (5.37), shows that the majority of the children did not make any improvement. Alex had improved by 13 points and post scored 46 out of 48. Mustapha had improved by 4 points, Zack had improved by 3 points and Karl had improved by 2 points, the three children had scored 0 post intervention.
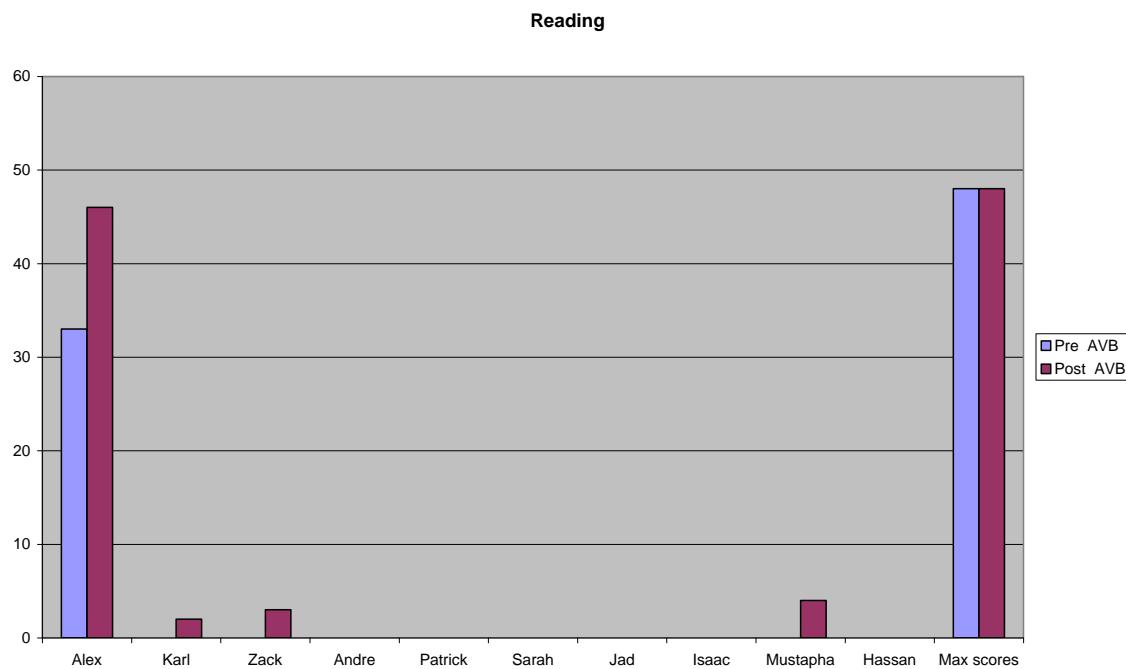
Reading

Figure (5.37) Reading Programme

r) Math

The Math programme involves teaching rote counting with and without prompts, counting objects, naming numerals in sequence, naming numbers, matching number with same amount of objects, adding numbers, time telling, identifying coins by name and value, identifying same and different, identify equal, more, less, greater, minus, plus and etc... as it is shown in figure (5.38), the majority of the children did not show any improvement at all, in exception to Alex who had improved by 11 points however he had scored 29 post AVB intervention out of 72 , Mustapha also had improved by 5 and Zack had improved by 4 points both had scored 0 pre intervention.
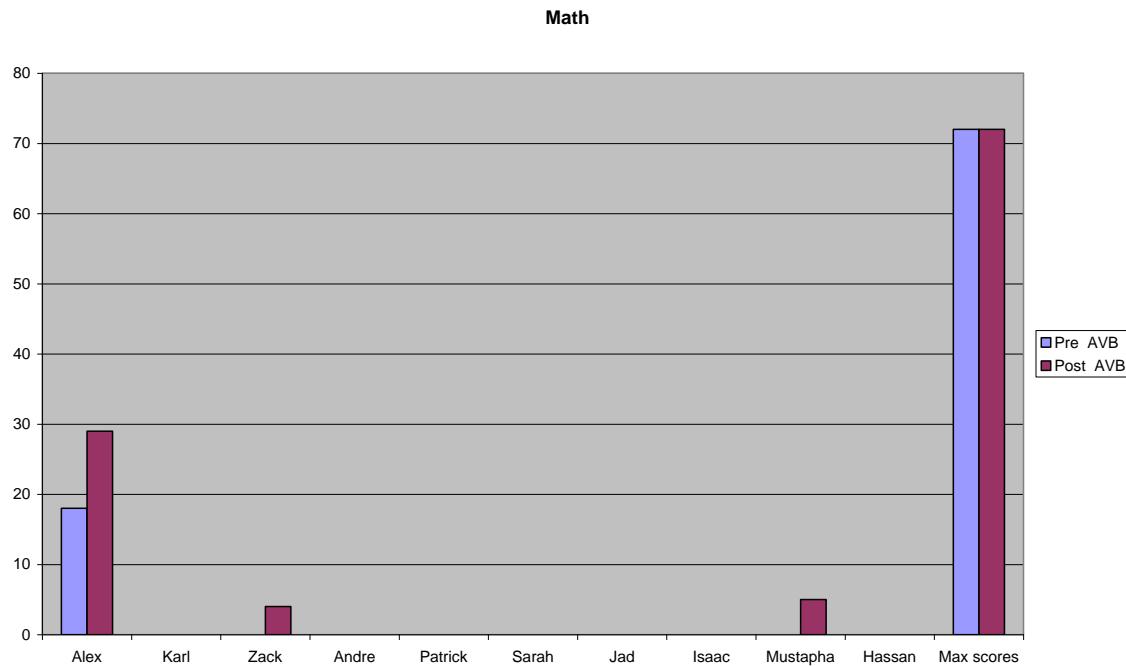
Figure (5.38) Math Programme

s) Writing

Writing programme involves teaching the children to mark on paper; colour between the lines; tracing, lines shapes, letters and numbers; copy straight and curved lines, copy and print letters and numbers. As it is shown in figure (5.39), the majority of the children has made noticeable improvement such as Alex who had post score 27 out of 32 and had improved by 9 points, Karl and Zack had improved by 9 points but they had scored 0 as pre-intervention. Sarah and Jad had improved by 6 points; Mustapha and Hassan had improved by 5 points, Isaac had improved by1 point only while Andre and Patrick did not show any improvement in this area.
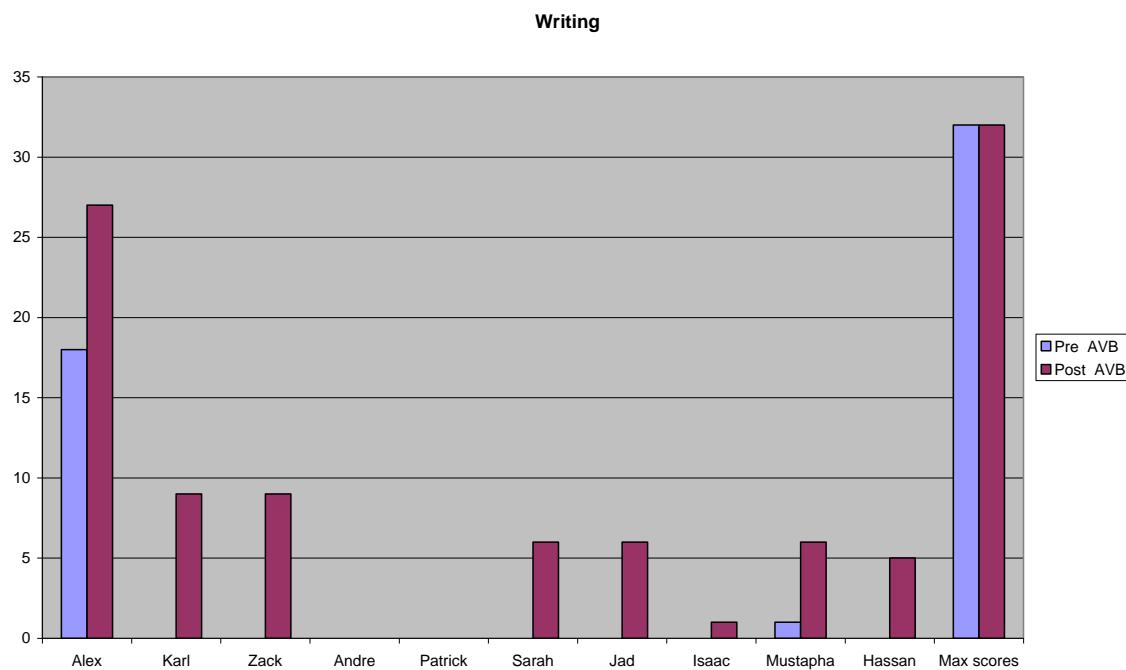
Figure (5.39) Writing Programme

t) Spelling

The spelling programme involves teaching the children matching individual letters to letter on word cards; filling in missing letter of words; copying words; writing in missing letter of words; spelling words vocally and spelling words in written form as in dictation. As it is shown in figure (5.40), only Alex had shown an improvement in this programme and had improved by 13 points, Karl, Zack and Mustapha had improved by 1 point only. The rest of the children did not make any progress in the spelling programme.
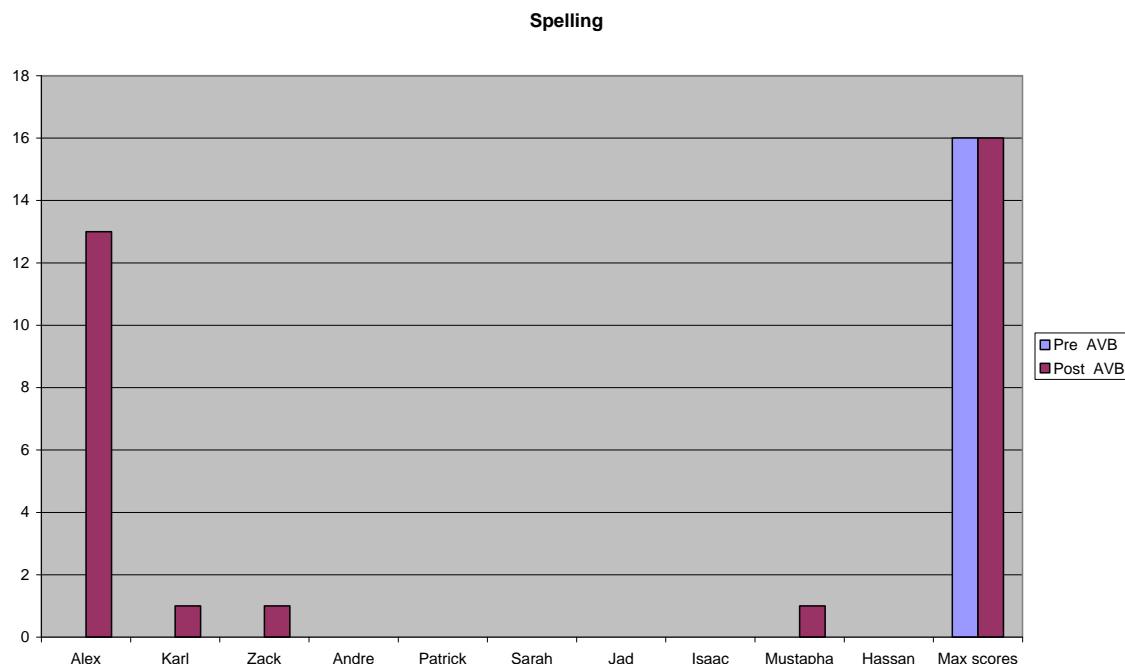
Figure (5.40) Spelling Programme

To summarize the Academic Section, it can be seen from the data above that not all the children have shown significant progress in the academic areas with the exception of Alex who made significant progress in the Reading and Math, writing and spelling

programme while Karl, Zack and Mustapha had made minor progress in the Reading, writing and spelling programme. Zack and Mustapha had made minor progress in the Math programme. Sarah, Jad, Mustapha and Hassan had shown significant improvement in the writing programme while Isaac has shown minor progress.

5.5.3 Self-Help Skills Section

Self- help skills are a part of everyday activities and are important and critical skills to acquire. Many skills identified in the Basic Learner Skills Section can be developed in conjunction with the teaching of the self-help skills. For example, the process of getting the child to brush his teeth can be a good opportunity to reinforce the child's cooperation, teaching him imitation (Motor, verbal and non verbal), teaching the child to receptively identify and label items, and talk about them if he is verbal.

u) Dressing

The Dressing programme involves teaching children some essential self- help skills such as putting pants, shoes, putting socks, putting coat, and buttoning shirts on and off; tying shoes; unzip and fastening zipper; fasten buttons; using buckles and adjusting clothing when needed. As it is shown in figure (5.41), the children have made significant improvement. Sarah had improved by 21 points out of 32; Jad had improved by 17 points; Hassan had improved by 16 points; Alex had improved by 14 points; Karl and Isaac had improved by 14 as well; Zack had improved by 11 points; while Andre and Patrick had improved by 9 points.
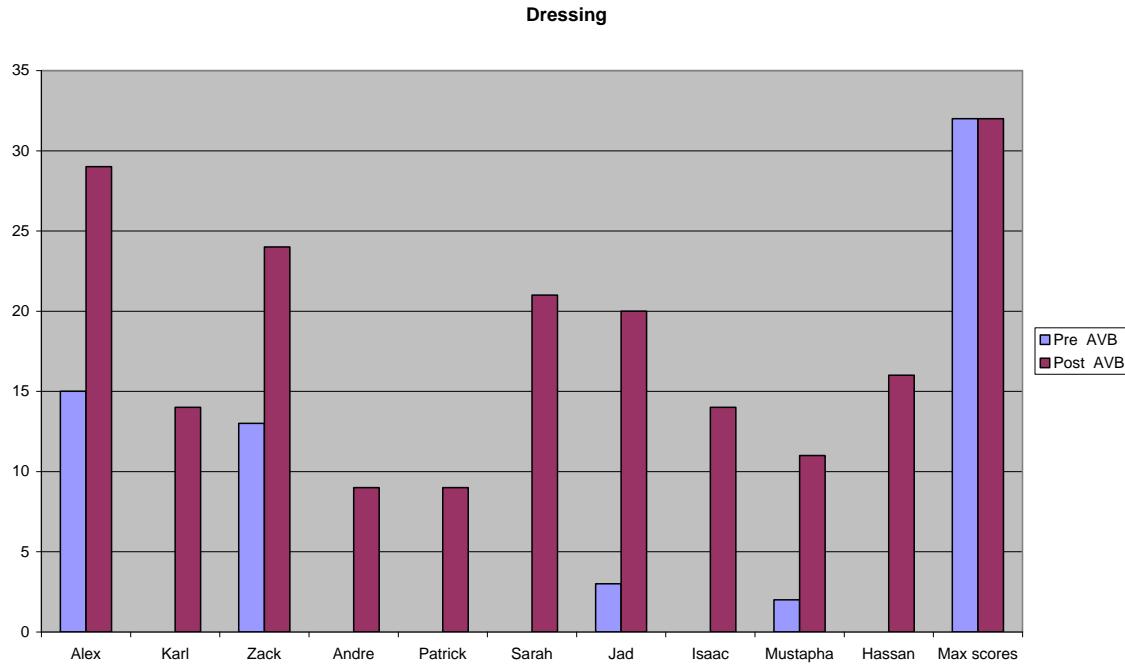
Dressing

Figure (5.41) Dressing Programme

v) Eating

The Eating programme involves teaching the children the proper way to eat and to learn the table manners. It involves teaching the children to eat finger foods; drinking from a straw; feed self with spoon or fork; pour liquid into cup without spilling; cutting food with knife; taking prepared lunch to table; cleaning up table after meals and keeping eating areas clean. Figure (5.42) shows that the children have made significant progress in the eating programme. Alex had 19 post scores out of 20 where he made an improvement of 5 points, Karl had improved by 12 points, Mustapha had improved by 10 points; Patrick, Sarah, Jad and Isaac had improved by 9 points; Andre and Hassan had improved by 8 points; Zack had improved 6 points. It should be noted that Although

Andre and Patrick made an improvement of 9-8 points; the reader is advised to recognise that these two children had never eaten any solid food ever before the implementation of the AVB programme.
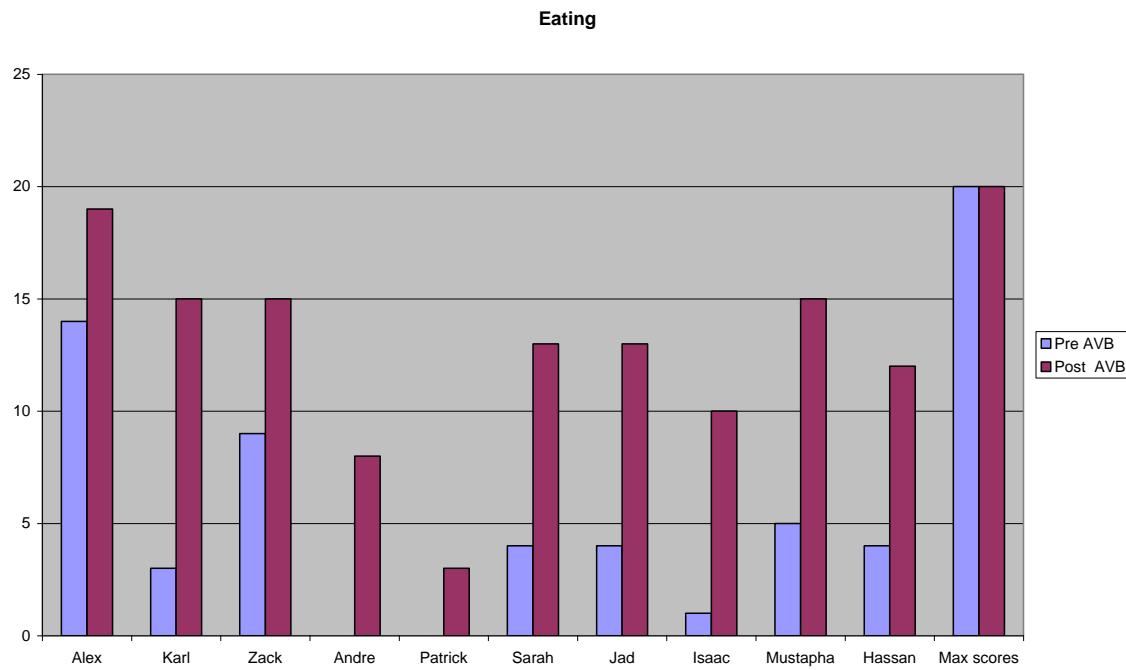
Eating

Figure (5.42) Eating Programme

w) Grooming

The Grooming programme involves teaching children self-help skills which involves washing and drying hands and face; combing or brushing hair; brushing teeth and blowing nose when needed. As it is shown in figure (5.43), the children have shown significant improvement in the grooming programme. Alex had improved by 6 points but had 13 post interventions out of 14. Hassan had improved by 9 points; Karl, Jad and

Mustapha had improved by 7 points; Zack and Sarah had improved by 4 points; Andre, Patrick and Isaac had improved by 2 points.
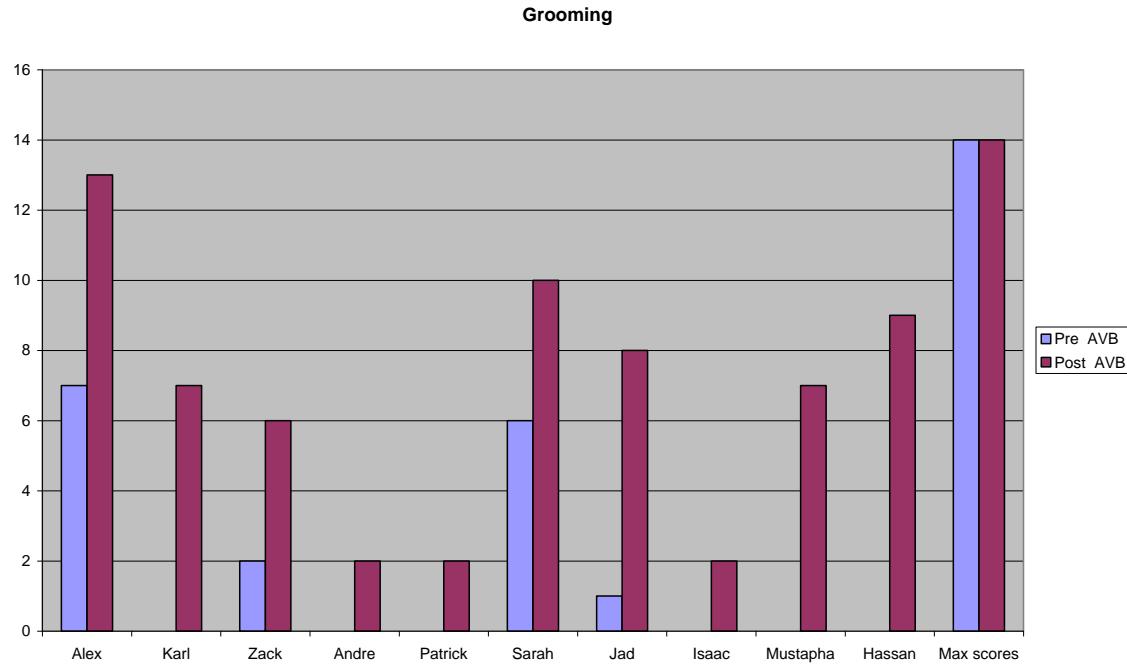
Grooming

Figure (5.43) Grooming Programme

x) Toileting

The Toileting programme involves training the children to become toilet trained and remain dry on schedule; independently using familiar toilets without assistance. As it is shown in figure (5.44), the post AVB result was varied between the children. Some children did not make any progress such as Patrick and Isaac, while others made slight improvement such as Andre and Hassan who had improved by 1 point and Karl who had improved by 2 points. The children who made significant improvement were Alex who reached the ceiling of the skill; he has improved by 9 points and scored 22 points. Sarah

and Mustapha had improved by 10 points and Zack had improved by 6 points. As for Jad, he was already toilet trained.
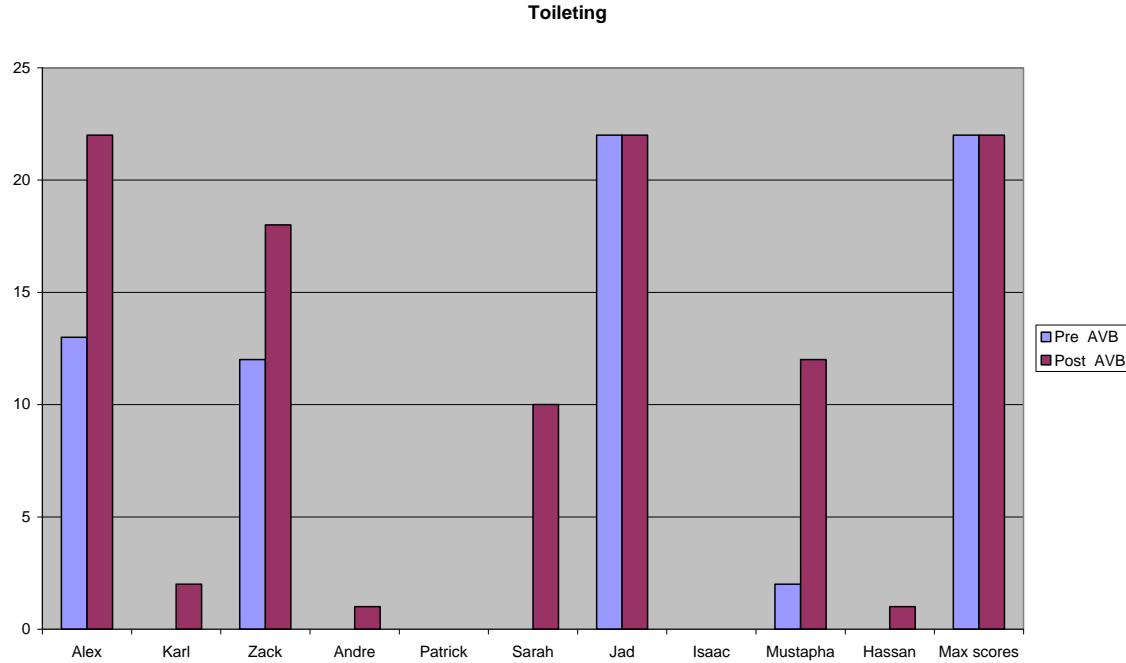
Toileting

Figure (5.44) Toileting Programme

To summarize the Self-help Skills Section, it can be seen from the presented data above that all the children have made significant progress in the Dressing, Eating and grooming programme. As for the Toileting programme Alex, Zack, Sarah, Mustapha had shown significant progress while Karl, Andre and Hassan had shown minor progress; Patrick and Isaac did not show any improvement in the Toileting Programme.

5.5.4 Motor Skills Section

Motor skills have many opportunities to incorporate their development into many of the daily activities. The development of both gross and fine motor skills allow the opportunities to reinforce the child's cooperation, developing imitation, receptive and expressive language skills, following routines etc.. The development of Motor skills can also facilitate the development of social interaction (Basic Learner Skills Section) by teaching the child to learn and engage in motor activities that involves his peers. These motor skills are fundamental and critical skills for the child in order to imitate motor movements which as a result will help a non-verbal child to imitate signs in order to communicate with others.

y) Gross Motor Skills

The development of motor skills is very important for helping the children to be successful participant in social interactions and mainstreaming opportunities such as playing games on a playground. It involves teaching the children to creep on stomach, kneel, walking forward and backward with appropriate gait, walking sideways, running smoothly, squatting, rolling sideways, hoping on two feet, skipping, jumping, balancing on one foot, kicking ball at target, throwing and catching a ball, bouncing and rolling a ball, ride tricycle/bicycle, jumping jacks, climbing ladder, pumping whiles swinging and hanging from bar. As it is shown in figure (5.45), the children have made noticeable improvement although Alex had improved by 4 points and reached the ceiling of the gross motor assessment scale which is 28 points. Mustapha had improved by 21 points, Jad had improved by 19 points, Karl had improved by 18 points; Sarah had improved by

17 points; Hassan had improved by 13 points; Patrick had improved by 12 points; Isaac had improved by 11 points; Zack had improved by 9 points and Andre had improved by 5 points.
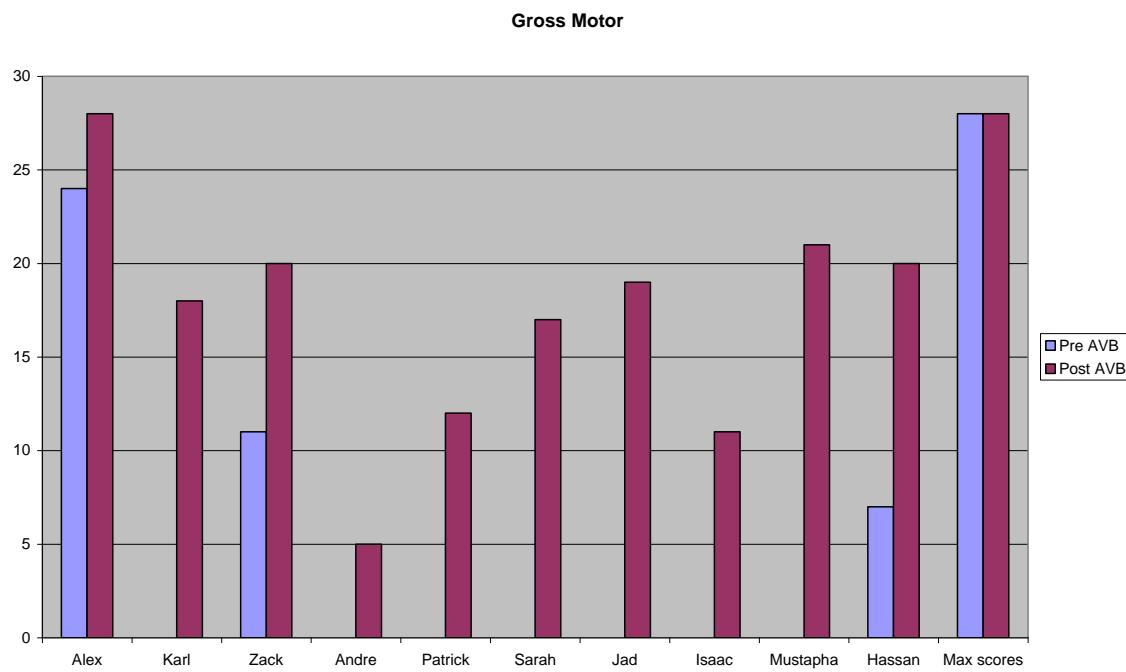
Figure (5.45) Gross Motor Programme

z) Fine Motor Skills

The Fine Motor Skills programme involves teaching the children to placing objects in a form box; placing pegs in a peg board; putting single and multiple piece inset puzzle pieces into frames; stacking blocks; placing blocks on block design cards; putting rings on pegs (stacking rings or stacking cups); transfer objects to the opposite hands, stringing beads, putting springy type clothespins on a line; sniping with scissors; using pincer grip;

marking on paper; colouring within boundaries; roughly copy shapes and patterns; cuts across paper with scissors; cutting out and pasting shapes; etc…

As it is shown in figure (5.46) the children have made tremendous improvement in the fine motor programme, Karl, Sarah and Isaac had improved by 21 points out 28 bearing in mind that they scored 0 as pre AVB intervention. Mustapha and Hassan had improved by 18 points. Isaac had improved by 17 points. Patrick had improved by 16 points. Zack had improved by 14 points. Andre had improved by 12 points. Although Alex had improved by 7 points only, he scored 27 out of 28 the maximum scores.
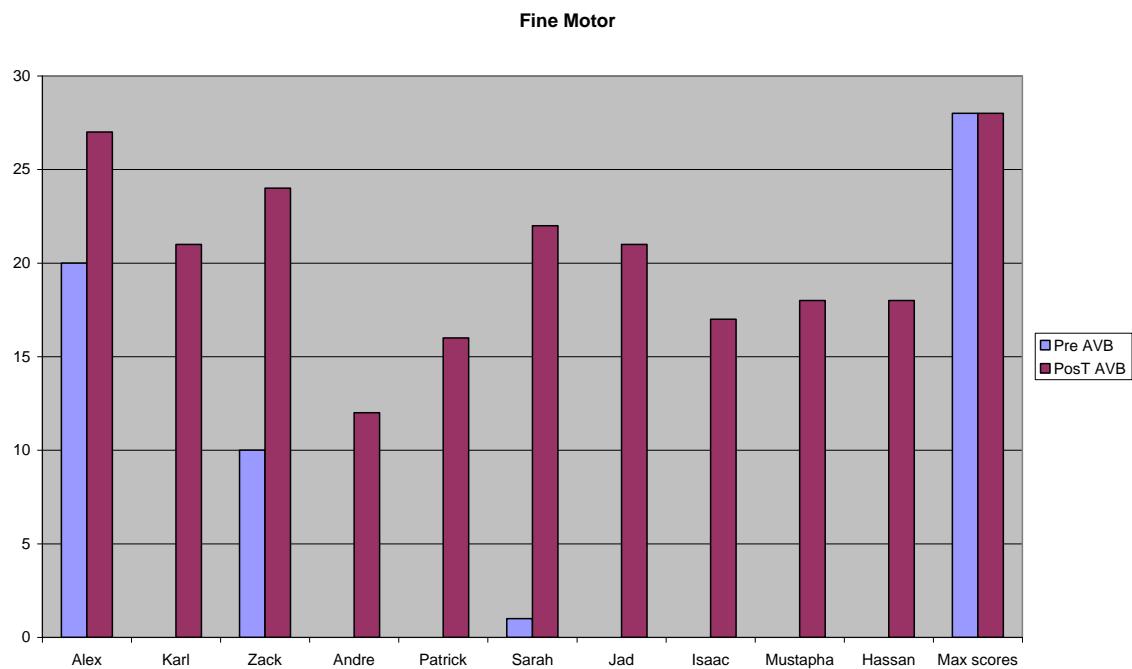
Figure (5.46) Fine Motor Programme

To summarize the Motor Skills Section, it can be seen from the presented data that all the children have made significant improvement in the Gross and Fine Motor programme.

Data gathered from "The ABLLS", figure (5.47) of each child participated in this study indicates that children have shown progress in performing skills in the area of adaptive functioning, language functioning and some academic functioning. Figure (5.48) presents the percentage of rate of improvement for each child participated in this study; the rate of improvement is measured by multiplying the pre AVB score of each child by 100 and the results is divided by the maximum scores.

For example Alex has pre scored 549 out of 1278 (the max ABLLS scores) 549x100/1278= 43%.
He post scored 929 out of 1278: 929x100/1278= 72.6%

The rate of improvement is measured by subtracting pre scores from post scores: 72.6 - 43= 29.6%

What the figures means that Alex's performance of specific skills on the ABLLS was improved by 29.6%. For the rate of improvement for the rest of the children, see figure (5.48)

The ABLLS Total PRE & Post Score
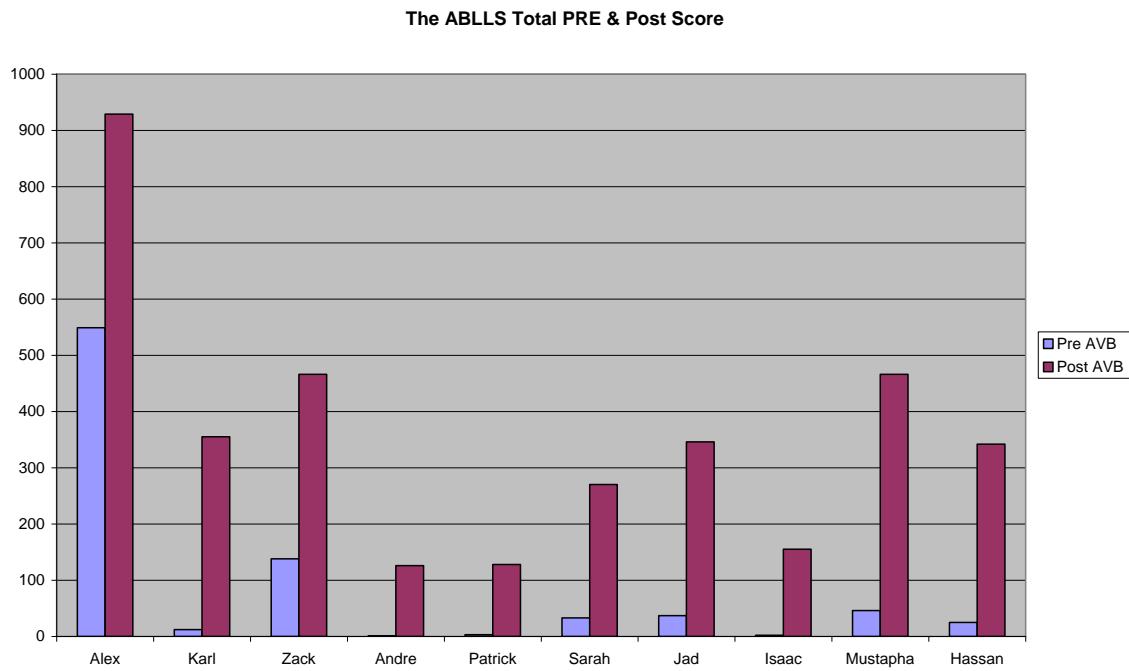
Figure (5.47) Total "The ABLLS" Scores Pre & Post AVB intervention

Names of the children	Pre AVB	% Pre	Post AVB	% Post	% Rate of Improvement
Alex	549	43	929	72.6	29.6
Karl	12	0.93	355	27.7	25.77
Zack	138	10.07	466	36.4	26.33
Andre	1	0.078	126	9.8	9.72
Patrick	3	0.23	128	10	9.77
Sarah	33	2.58	270	21.1	18.52
Jad	37	2.89	346	27	24.11
Isaac	2	0.15	155	12.1	11.95
Mustapha	46	3.59	466	36.4	32.81
Hassan	25	1.95	342	26.7	24.75
Max Scores	1278	100	1278	100	100

Figure (5.48) "The ABLLS" Percentage of Improvement Out of Maximum Score" High Score Indicates Improvement in Skills

Summary

To summarize this chapter, it can be seen that from analyzing the Parenting Stress Index "PSI" Short Form, that the parental stress level was decreased significantly. The results of the Parenting Stress Index "PSI" indicate that the improvement and progress of the children using the AVB programme have influenced and decreased their parents' stress level which allowed better parent to child relationship.

As for the Childhood Autism Rating Scales "CARS" assessment which was conducted by an independent psychologist, and by analyzing the "CARS" assessment over one year period before the AVB Intervention, it can be seen that only 2 children had made very minor progress, and the rest of the children did not show any progress. However, analyzing "CARS" Pre & Post AVB Intervention, all the children had made noticeable progress and they showed a decrease in the degree of autism. Some children had made significant improvement such as Alex whom his score was in the non autistic category. Another 3 children had reached the border between mild autism to non-autistic range.

As for The Behavioural Language Assessment Form "The BLAF" which is used to examine the children's skills in different areas such as cooperation, requesting, imitation, matching, labelling, receptive language, conversation, academic and social skills, children showed noticeable improvement in all areas. Examining the pre and post scores of The BLAF, it clearly indicates that 7 out of 10 children had improved significantly such as Alex who had scored the maximum scores. Only 3 children have shown moderate improvement which is still good leap for their outcomes.

Examining The Assessment of Basic Language and Learning Skills "The ABLLS" results it can be seen that all the children (10 out 10 children) have made significant progress in the cooperation programme, play and leisure, social interactions, group instructions, class-room routines, and generalized responding, Dressing, Eating and grooming programme. As for the Toileting programme 4 out of 10 children had shown significant progress while another 3 children had shown minor progress. The remaining 3 children did not show any changes at all. Analyzing The ABLLS further, it seems that Alex is the only child who made major improvement in all the programme except for the syntax and grammar programme.

All the children have made significant progress in the Visual performance programme except 3 children who made minor to moderate progress. As for the receptive language programme, imitation programme, spontaneous vocalization programme 6 out of 10 children had made significant improvements while the remaining 4 have made minor to moderate progress. As for the vocal imitation, request programme, 4 out 10 children have made significant improvement while the remaining 6 had made minor to moderate progress. As for the labelling programme, Intraverbals programme which is a very advanced programme for verbal children, only 2 children had made noticeable progress while the rest had shown minor to non progress.

Analyzing all the above tests, it clearly indicates that the improvement the children had made or shown can be attributed to the implementation of the AVB programme. Some children have made noticeable improvements while others had shown minor to moderate

progress. As mentioned previously in the literature review chapter, the children with autism differ in their ability and capabilities. However, all the children have shown significant progress in their performances in the areas which concern behaviours, the attending skills, social and play skills. The children have become more cooperative and the parent stress level was decreased and the independent psychologist has noticed the progress in the children's performance which was documented to all of the children who participated in this study.

It seems that implementing the AVB programme influenced all parties involved in this study parents and children alike.

Next chapter will present and analyze the evaluation of the children's progress and performance from the points of view of their teachers and parents.

Chapter 6 - Summary of Results: Evaluation of the Children's Progress by Teachers and Parents

The aim of the previous chapter was to present and analyze the findings of the children's progress and performance by the   tests and the assessments which were conducted by the researcher and the independent psychologist. The aim of this chapter is to present and to analyze the findings of the children's progress by their teachers and their parents.

The purpose of the research is to study the effects of implementing an AVB programme on children with autism in the areas of academic functioning, language functioning and adaptive functioning. As previously stated in the Methodology Chapter, the researcher has used The Assessment of Basic Language and Learning Skills "ABLLS" and the Behavioural Language Assessment Form "BLAF" in order to measure the children's progress in the area of Basic learner Skills, Academic skills, Self- Help skills and Motor Skills. To validate the children's outcomes the researcher has developed the evaluation form questionnaire which has to be filled by parents and teachers and allow them to report their children's progress or lack of progress. In addition, the children were assessed using Childhood Autism Rating Scales "CARS", one year before starting the intervention by an independent psychologist and they were assessed again at the beginning and the end of the AVB intervention. As children with autism exhibit some behavioural difficulties which will affect the relationship between them and their parents and make it difficult to communicate, a Parenting Stress Index Short Form is filled by the

parent at end of the intervention to measure their stress level and compare it to the pre-interventions scores.

In order to achieve this objective, the evaluation form was used in order to measure the children's progress and performance:

1. Questionnaire/Evaluation Form by Teachers.
2. Questionnaire/Evaluation Form by Parents.

The reader is advised that the evaluation form for teachers and parents are the same questionnaire but they had to be filled separately by teachers and parents.

6.1 Evaluation Form by Teachers and Parents

A) Purpose

The evaluation Form is a semi-structured questionnaire which was designed for both parents and teachers in order to investigate the effects of implementing an AVB programme on children with autism.

B)Method

An original pilot questionnaire (See Appendix J) was developed by the researcher in order to address the children's behaviours, progress and development by the respondents (parents and teachers). The questionnaire was sent to teachers and parents twice at the beginning of the academic year at The Autistic Centre prior the AVB intervention and at the end of the Academic year post AVB intervention. Lower scores indicate improvement

in the children's performance. Improvement is measured and obtained by subtracting post AVB scores from pre AVB scores.

There are four sections in the questionnaires where children were evaluated by their teachers and parents. The reader is reminded that the evaluation by the teachers and the parents are quantitative (performing skills, tests) and qualitative judgment which is based on overall knowledge of each child:

- Section 1 look at the child's personal details such as age and the degree of the child's disability from the teachers' or parents perspectives.

- Section 2 look at Behaviour such as self-injurious or aggressive behaviours and self-stimulatory.

- Section 3 look at the progress and development of the children which might be attributed to the AVB programme. It covers the areas of: Behaviour; Compliance; Waiting; Performing skills in different situations; Receptive Language; Receptive& Expressive Behaviour; Social Intraverbals; Non-Verbal Imitation; Matching and Sorting; Plays Skills; Objects Labelling; Verbal Imitation; Abstract Concept; Sentence Structure; Academic Works; Social Repertoire; and Self-help Skills.

- Section 4 is related to the teachers or parents' personal view.

The questionnaire was designed for both parents and teachers, most items were quantitative in nature in exception to section 4 where there was 7 open-ended questions and therefore, qualitative in nature. The open-ended question allowed the respondents the

freedom to express in their own words their point of view of the children's progress and their experience of implementing AVB Programme for their children (for further details, see the Methodology Chapter: processing data's questionnaire section).

The original questionnaire was piloted and respondents were asked to complete the questionnaire without the presence of the researcher and they were encouraged to write their comments on the questions or any answers they wished to provide.

Minor revisions were made to the questionnaire before reaching the final version. The open-ended questions were coded; a *posteriori* coding was opted for, as they involved qualitative information. The researcher read each questionnaire at least three times, first to assign codes then when putting the codes using excel and the third time was to check and ensure accuracy (See Methodology Chapter: the coding section).

The reader is reminded that when a pre score does not show on any table, it means that the child had scored 0 (pre-AVB intervention).

C)Procedure

A description of the procedure was discussed previously in the Methodology Chapter therefore, only a brief description is given.

After receiving The Board of Trustees' approval, an introduction letter from the researcher alongside the questionnaire was sent to respondents. Once received (one week

later), all questionnaires were given a different name instead of a case number because of the small numbers of children participated in the study. Children's names were changed in order to protect their identity, parent and teachers were referred to as the parent/teacher of the specific child.

Responses to the questions were coded and Microsoft Office Excel 2003 programme was used for collecting and analyzing the data. Teachers and parents forms were analyzed separately and later on the results findings of both questionnaires were compared in order to find any similarity or any differences.

The open-ended question had a previous question which refers to either positive or negative outcome or not sure category. This design made it easier for the researcher to classify the answers. In the positive category, the respondent must circle yes, and those who answered No or Not Sure are classified in another category.

6.2 Teachers' Evaluation:

6.2.1 Section 1 Personal Detail:

- The children participated in the study were all male except one female (Sarah). As for the age of the children it ranges between 3 to 9 years old at intake. To protect the children's identity the specific date of birth is not given. In addition, the main question in this section is about how children are affected by the disability. The table below shows the gender and the age of the children:

Name of Children	Age's Range	Gender
Alex	9	Male
Karl	3	Male
Zack	8	Male
Andre	6	Male
Patrick	3	Male
Sarah	4	Female
Jad	6	Male
Isaac	6	Male
Mustapha	4	Male
Hassan	3	Male

Figure (6.1) Children's Age and Gender

1. How children are affected by disability?
In the teacher's opinion, how affected by his/her disability is the named child?

On a scale from 1 to 8, the teachers are judging the degree to which each child is affected by his/her disability. From the teachers' perspective "1" means the child is mildly affected by disability and "8" means the child is severely affected by disability.

1(least)   2   3   4   5   6   7   8(most)

Teachers evaluation of how the children are affected by their disability i.e. autism, are shown in the bar chart below, higher scores indicate severe autism. Figure (6.2) indicates the progress the children have made according to their teachers who agreed on giving a particular score for each child. The reader is reminded that lower scores indicate improvement in the children's performance. Improvement is measured and obtained by subtracting post AVB scores from pre AVB scores.

As it is shown in the bar chart below, 8 are the max level score which indicates severe type of autism. For example, Jad had scored 7 as pre AVB intervention, later he scored 4 post AVB intervention where he improved by 3 points. This score put him in the mild category of autism. Children Alex, Karl Zack, Patrick, Sarah, Isaac have improved by 2 points post AVB intervention bearing in mind although Alex had only improved by 2 points he is the only child who scored 2 post intervention which put him in the high functioning criteria. Andre, Mustapha and Hassan have improved by 1 point only.

How affected by disability
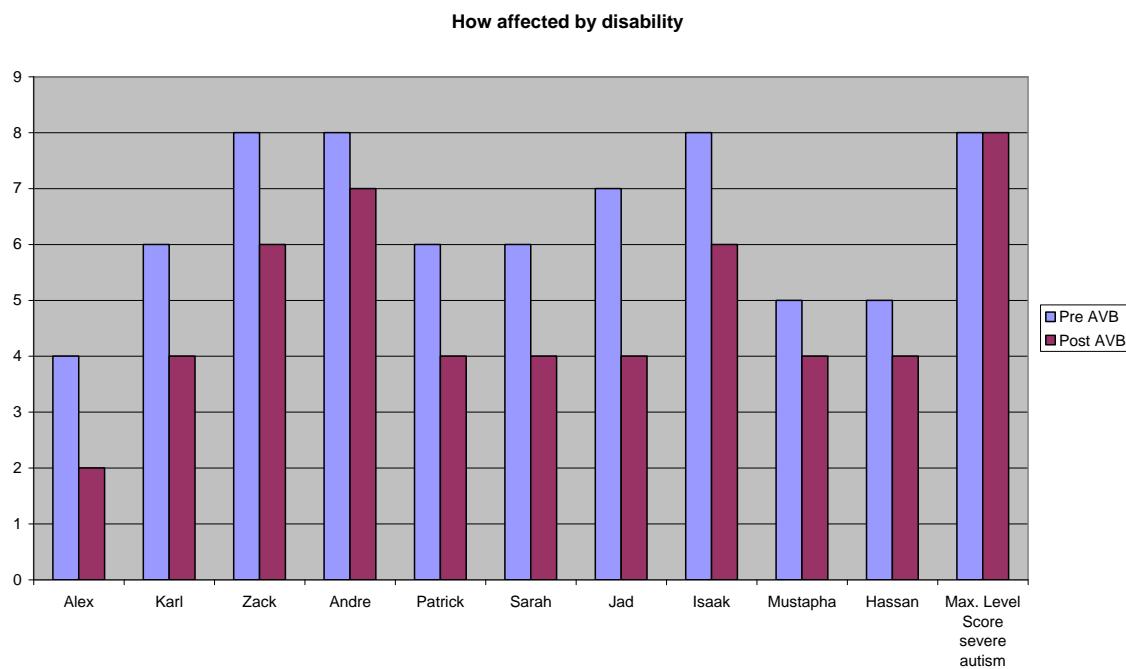
Figure (6.2) Teacher's view of the children disability.

6.2.2 Section 2 Behaviour

Section 2 describes the children's behaviours after the implementation of the AVB

Programme. Coding is done by assigning a score to each item (see Appendix).

1. Aggressive and Self-Injurious Behaviours:

Does the child display any self-injurious behaviour or aggressive behaviour towards others?

The coding of self-injurious or aggressive behaviours for the children participated in this study is done by assigning the following points:

- 1 point when the behaviour rarely occurs.

- 2 points when the child is excited.

- 3 points for other reasons.

- 4 points when the child is under-stimulated.

- 5 points when the child is frustrated.

- 1 point when the behaviour occurs less than 1 time per day.

- 2 points when the behaviour occurs 1-5 times per day.

- 3 points when the behaviour occurs 6-10 times per day.

- 4 points when the behaviour occurs 11-15 times per day.

- 5 points when the behaviour occurs more than 15 times per day.

The total points are summed all up in order to get the final scores. Pre & post final scores are compared. The reader is reminded that lower scores indicate improvement in the children's performance. Improvement is measured and obtained by subtracting post AVB scores from pre AVB scores.

As for the Children's aggressive and self-injurious behaviours such as biting, hitting and kicking as evaluated by their teachers, only 3 children did exhibit this type of behaviours

while the rest did not. Those three children who exhibited these types of behaviours had clearly improved from scoring 24 points pre AVB intervention which indicates severe aggressive and self-injurious behaviours to the following post intervention scores: Karl scored 8, Zack scored 10 and Jad scored 13. It can be seen from calculating the pre and post scores as shown in figure (6.3) that Karl has improved dramatically by 16 points while by Zack has improved by 14 points and Jad by 11 points.

Aggressive and Self-Injurious Behaviours
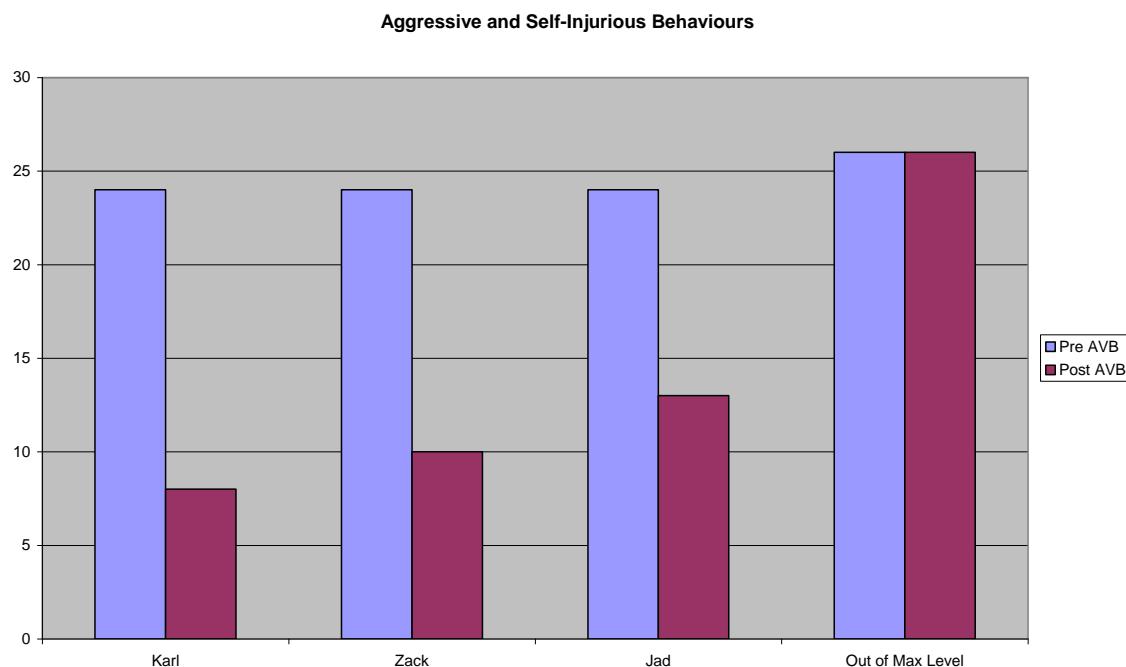
Figure (6.3) Aggressive and self injurious behaviours

2. Types of Self-Stimulatory Behaviours

Children with autism may engage in self-stimulatory behaviours such as sucking and mouthing clothes, hands and feet restless, closing and opening doors, spinning and flapping objects, smelling people or objects and others. The sensory mechanisms which are being stimulated for each behaviour are indicated as follows: verbal, oral, gross

motor, Olfactory (smell) and Tactile (feel). Each sensory mechanism has been assigned 1 point and children may score more than one sensory mechanism.

Self-Stim Behaviours
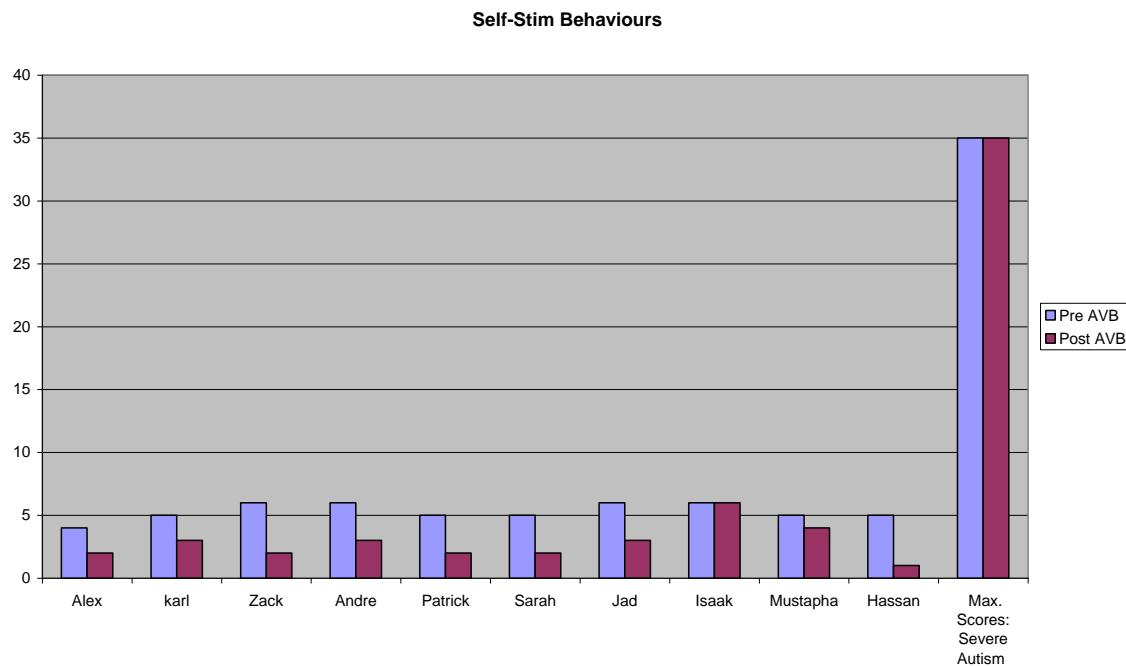
Figure (6.4) Self-Stim Behaviours

As for the types of self – Stim Behaviours, the children have shown an improvement in this area. However, as it is shown in figure (6.4), the maximum level scores for self-stim behaviours was 35 while the pre maximum scores that the children had, was only 6. Figure (6.4) shows that only Isaac's self-stim behaviours did not change. The rest of the children have shown an improvement such as Zack and Hassan who have improved by 4 points. Other children improved by 3 points such as Andre, Patrick, Sarah and Jad. Alex and Karl have improved by 2 points while Mustapha has improved by1 only.

3. The Sources of Triggers of Self-Stim Behaviours:

The occurrence of Self-Stim Behaviours might be triggered when the child is frustrated, under-stimulated, excited, rarely or for some other reasons. Figure (6.5) clearly indicates the improvement the children have made in comparison to pre-scores. The maximum level scores for this question were 105 points. Four children had 84 points as pre scores such as Zack, Andre, Jad and Isaac. Those who had the maximum pre scores have improved the most as Jad has improved by 74 points and scored 10 points post AVB intervention while Andre has improved by 73 points and scored 11 post AVB intervention. Zack has improved by 70 points and scored 14 post AVB intervention. Sarah and Hassan both have improved by 60 points and they scored 10 post AVB intervention. Patrick has improved by 55 points while Karl has improved by 54 points. Mustapha had improved by 44 points. Although Alex had improved by 42 points, he had the least self-stim behaviours (6 post scores versus 48 pre AVB intervention).

The summary of the above results indicates that the self-stimulatory behaviours of the children were greatly reduced. The decrease of self-stim behaviours can be attributed to the implementation of an AVB intervention where children had the chance to be stimulated and were taught an alternative appropriate behaviour which decreases the value of self-stimulatory one.

Sources of Triggers of Self-Stim Behaviours
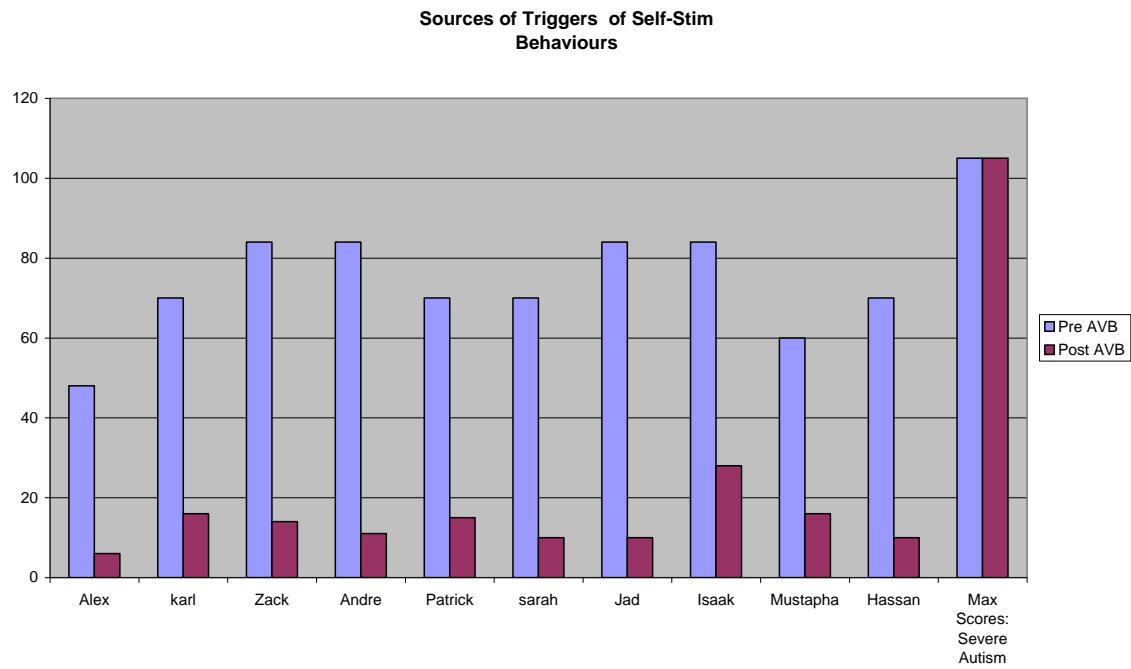
Figure (6.5) Sources of Triggers of Self-Stim Behaviours

4. The Frequency of Self-Stim per day:

The main question here is how many times per day did the self-stim behaviours occur?

If the self-stimulatory behaviour occurs:

- More than 15 times per day, the child is assigned 5 points

- 11 to 15 times per day, the child is assigned 4 points.

- 6-10 times per day, the child is assigned 3 points.

- 1-5 times per day, the child is assigned 2 points.

- Less than 1 time per day, the child is assigned 1 point.

Figure (6.6) shows that the children have made significant improvement in reducing self stimulatory behaviours. Jad has improved by 26 points although he had the highest scores pre AVB intervention. While Zack and Andre have improved by 24 points. Patrick has improved by 22 points while Sarah and Mustapha have improved by 21 points. Karl and Hassan have improved by 20 points. Alex has improved by 15 points. Isaac has improved by 12 points.
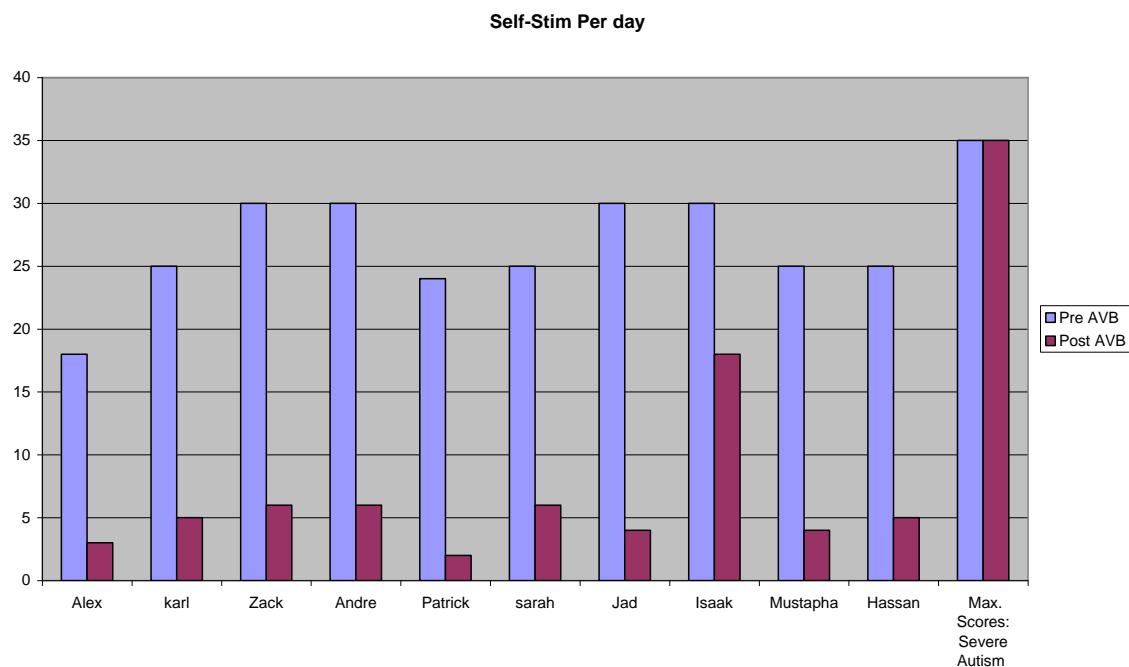
Self-Stim Per day

Figure (6.6) Self-Stim per Day

In summary, the aggressive and self-stimulatory behaviours of children and according to their teachers' perceptions were considerably reduced post AVB intervention.

6.2.3 Section 3 Progress and Development

This section asks about any behavioural or physical change in the child which can be attributed to the AVB programme. The figures of this section were derived from assigning codes to the answers:

- Regressed: was assigned 4 points

- No change: was assigned 2 points.

- Significant improvement: was assigned 1 point.

- N/A: was assigned 0 point.

Children's post AVB scores are compared to the maximum scores of the specific programme and improvement is obtained by subtracting children's post AVB scores from the maximum scores of the programme. The reader is reminded that lower scores indicate improvement in the children's performance.

1. Behavioural Changes
Have you noticed any behavioural or physical changes in your child whom you can attribute to the AVB programme?

To answer the above question, the teachers are provided with 4 categories:

- Regressed: is assigned 4 points

- No change: is assigned 2 points.

- Significant improvement: is assigned 1 point.

- N/A: is assigned 0 point.

The children's behaviours such as tantrums, self- abused, aggression, self-stim, leaving

work area, following simple direction etc… were observed by the teachers

The behavioural changes the children have exhibited; figure (6.7) indicates the

improvement the children have shown. Most of the children have had fewer scores

which indicate greater improvement in their behaviours after the implementation of AVB

Intervention. Alex has improved by 41 points while Karl and Andre have improved by

40. Zack, Patrick, Sarah, Isaac, Mustapha and Hassan have improved by 39 points while

Jad has improved by 38 points.
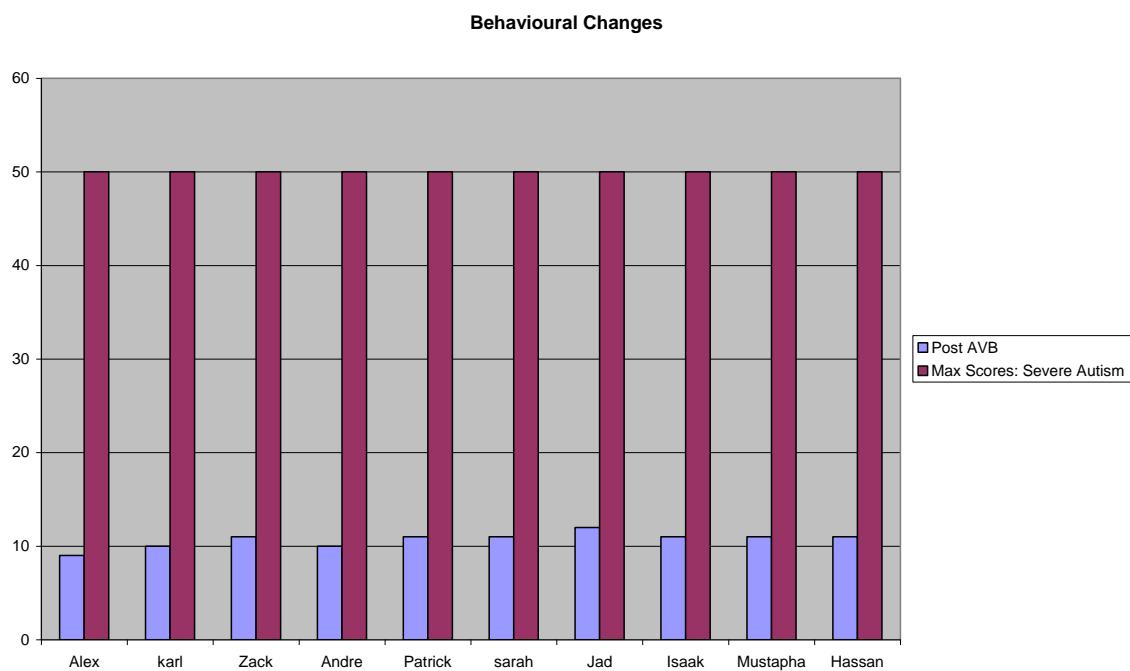
Figure (6.7) Behavioural Changes

2. Compliance:

The compliance programme involves the following:

- Coming when called from different part of the room or from a distance.

- Following instructions to sit down or standing up.

- Following instruction to put hands down and retrieving objects.

The compliance programme as it is shown in figure (6.8) indicates that all the children have made noticeable improvement where four children Alex, Jad, Mustapha and Hassan have improved by 36 points. Karl has improved by 34 points, Zack and Isaac have improved by 33 points, Sarah has improved by 32 points, and Patrick has improved by 31 points while Andre has improved by 30 points.
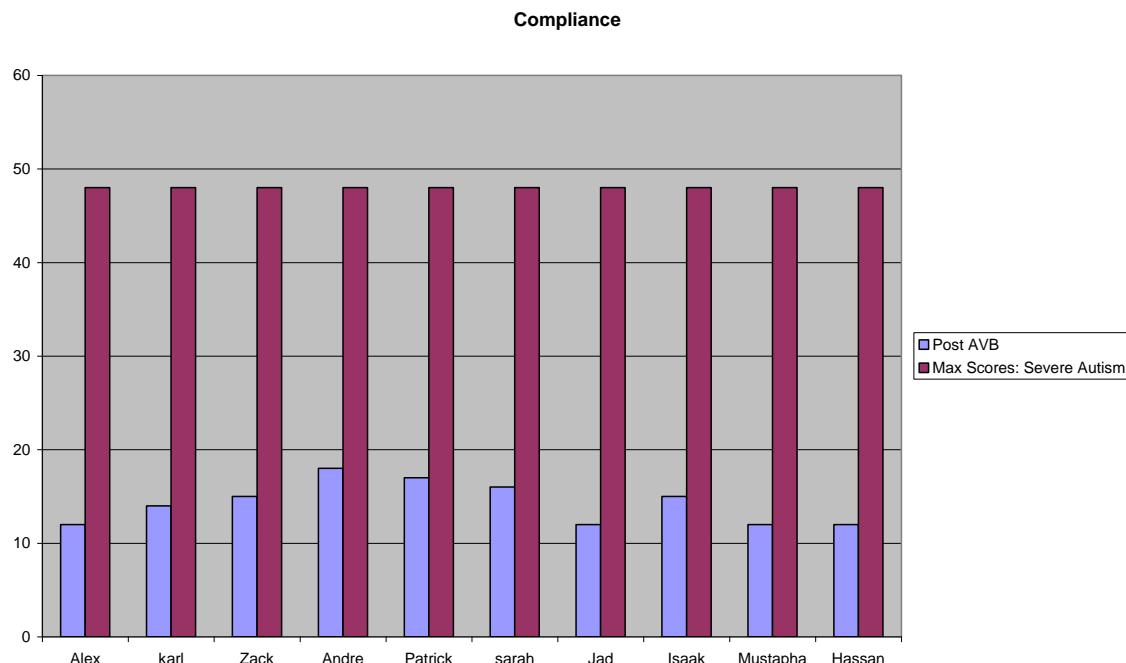
Compliance

Figure (6.8) Compliance

3. Waiting

The waiting programme involves the child to:

- Wait to hear instructions.

- Taking turns in preferred activities.

- Waiting for high reinforcer for up-to 2 minutes.

In the waiting programme all the children have shown significant improvement in this area. All the children except Isaac has improved by 12 points while Isaac has improved by 11 points, as it is shown if figure (6.9).

Waiting

Figure (6.9) Waiting

4. Performing Skills in Different Situations

This programme involves the children to perform skills:

- With different children.

- With different people.

- In different places.

- Generalizing appropriate behaviour and compliance in many different settings.

Figure (6.10) shows that all the children have significantly improved in performing skills in different situations, by 12 points except Isaac who has improved by 8 points only.
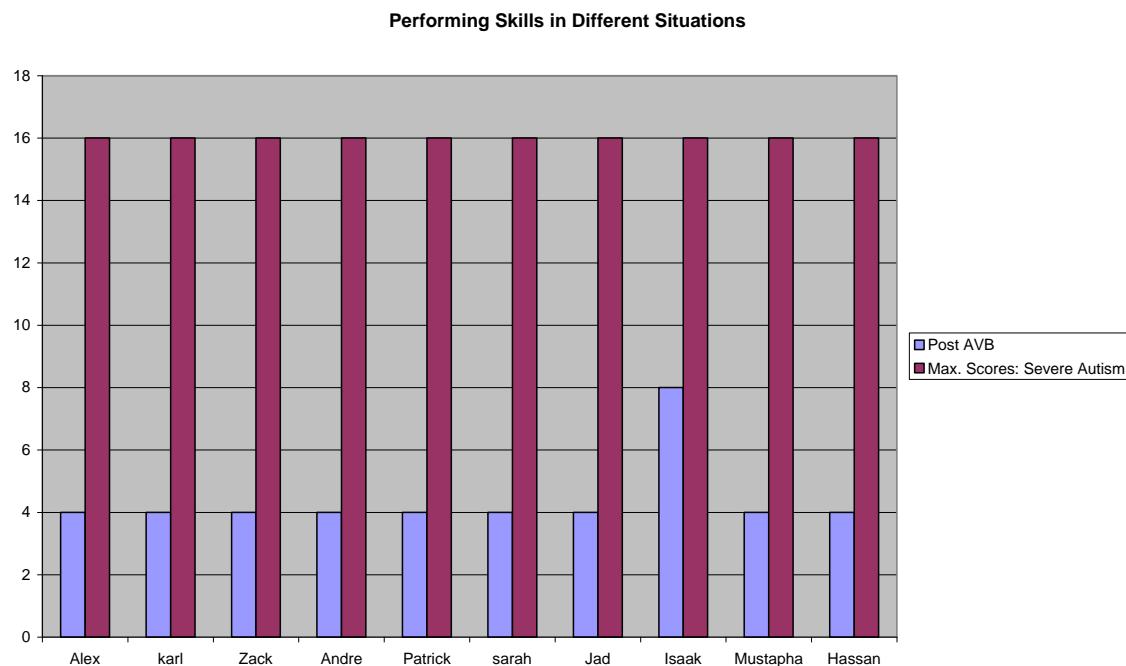
Figure (6.10) Performing Skills in Different Situations

5. Receptive Language

The receptive language programme involves the children to follow simple instructions such as:

- Coming over when called.

- Sitting down.

- Looking at people while talking (giving eye contact).

- Responding to his/her name.

- Go to the named person.

In the Receptive Language programme all the children have made dramatic improvement as indicated in figure (6.11). Alex, Zack, Andre, Sarah, Jad, Mustapha and Hassan have improved by15 points while Karl, Patrick and Isaac have improved by 14 points.

Receptive Language
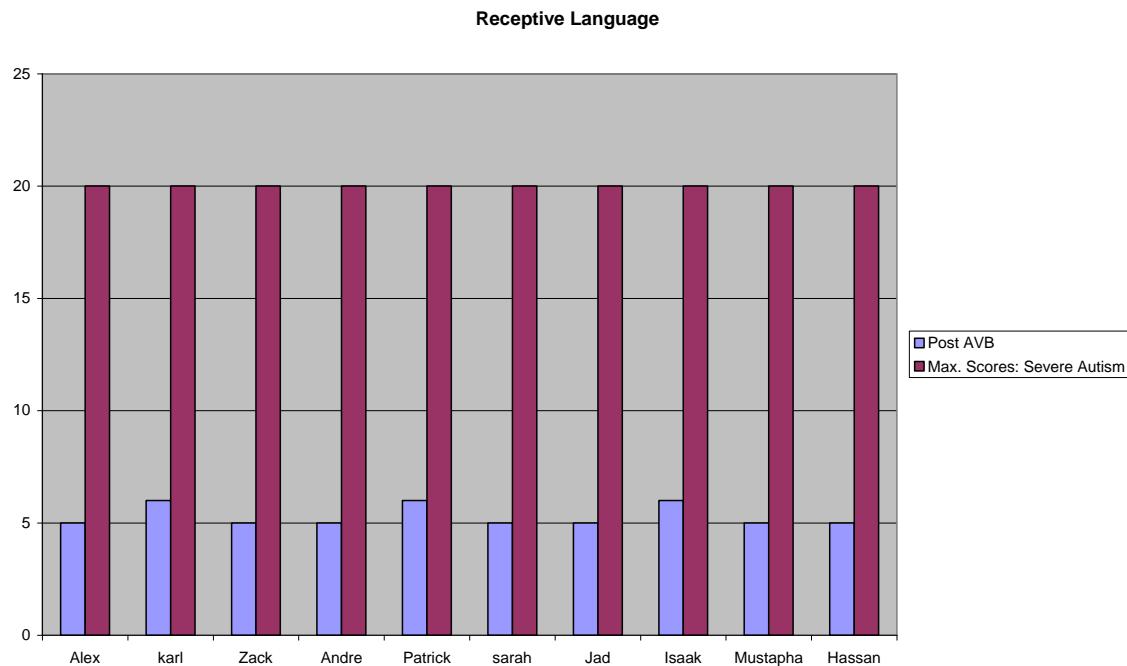
Figure (6.11) Receptive Language

6. Receptive Behaviours

The receptive behaviour programme involves the children to follow instructions in the following area:

- Sitting still when told.

- Maintaining eye contact.

- Imitating non verbal gestures (DO THIS).

- Following verbal commands in one-to-one setting.

- Following receptive commands: 1 step command, 2 steps commands and 3 steps commands.

- Discriminating actions by demonstrating: e.g. show me eating.

- Discriminating actions by pointing.

- Retrieving a list of objects.

As for the Receptive Behaviour programme as indicates in figure (6.12), the children have made noticeable improvement in this area. Alex and Mustapha had improved by 30 points, Zack has improved by 29 points, and Karl and Hassan have improved by 26 points. Sarah and Jad have improved by 25 points, Patrick has improved by 24 points, and Andre has improved by 23 points while Isaac has improved by 22 points.

Receptive Behaviours
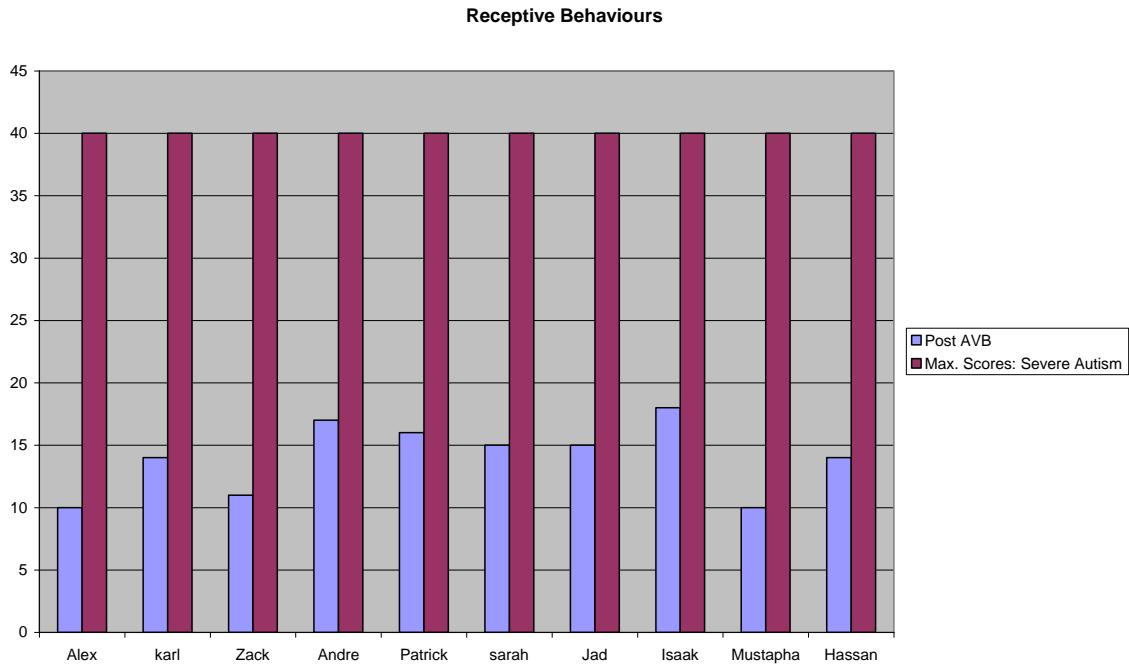
Figure (6.12) Receptive Behaviours

7. Expressive Behaviours

The expressive behaviour programme involves the child to communicate with others using gestures, words, signs or pictures. It involves the child to:

- Use appropriate verbal behaviour (to mand or to get attention) rather than cry or tantrum.

- Manding for objects, activities.

- Manding using simple words, using "please" or "I want … please".

- Manding for help and assistance.

- Manding to play.

- Tact or label actions using single words, simple sentences etc…

- Use more or less.

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In expressive behaviours programme the children have shown noticeable improvement as indicated in figure (6.13). Alex has improved by 57 points, Mustapha has improved by 53 points, Hassan has improved by 49 points, Zack has improved by 46 points, Karl has improved by 45 points, Sarah has improved by 44 points, and Patrick and Isaac have improved by 40 points.
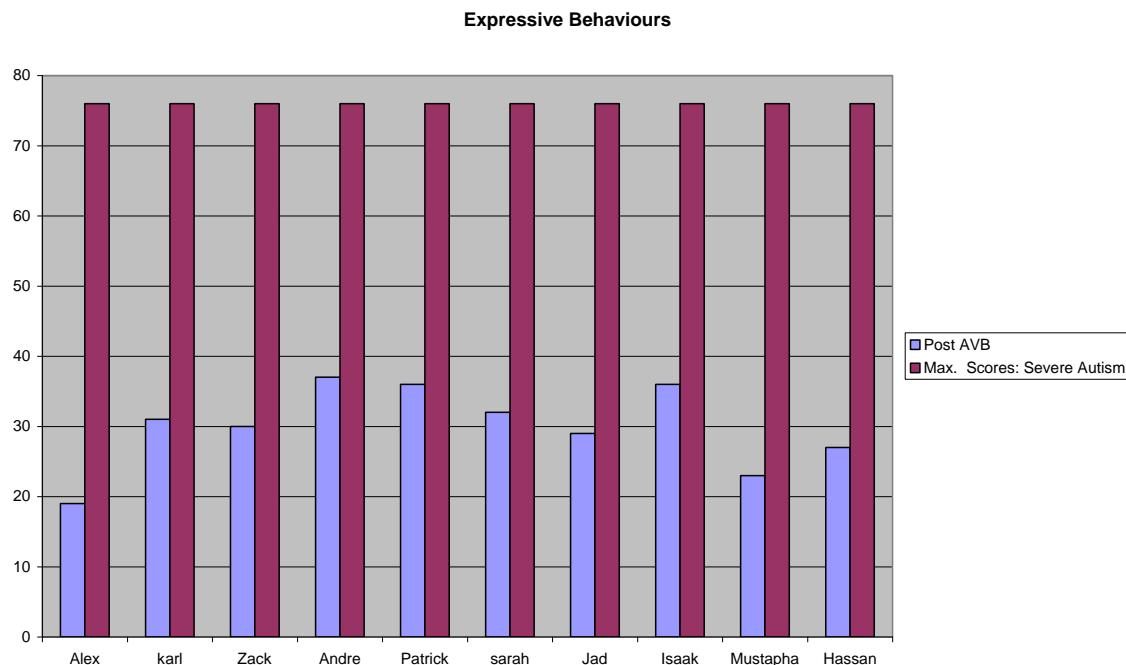
Figure (6.13) Expressive Behaviours

8. Social Intraverbals

The social Intraverbals involves the child to:

- Greets others with "Hi".

- Responds appropriately to "How are you?"

- Say or wave bye to others.

- Say common nursery rhymes or sing songs.

In the social Intraverbals, the children have shown noticeable improvement as indicated in figure (6.14). Alex and Mustapha have improved by 12 points; Karl, Sarah, Jad and Hassan have improved by 10 points; Zack, Patrick and Isaac have improved by 9 points while Andre has improved by 8 points.

Social Intraverbals
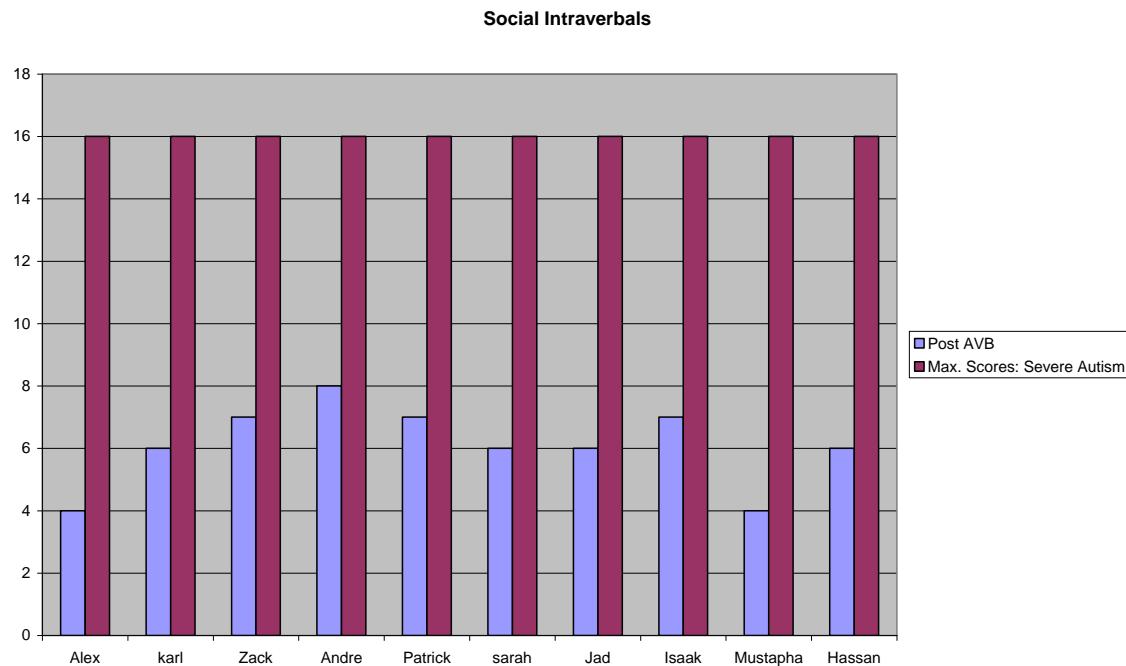
Figure (6.14) Social Intraverbals

9. Non-Verbal Imitation

The non-verbal imitation programme involves the child to imitate:

- Gross motor movements.

- Fine motor movements.

- Oral motor movements.

- Object use chaining: imitating action using objects with discriminations.

In the non - verbal imitation programme, the children have made significant improvement as indicated in figure (6.15). Alex, Sarah and Hassan have improved by 12 points; Karl, Zack, Patrick Jad and Mustapha have improved by 11 points; Isaac has improved by 9 points while Andre has improved by 8 points only.

Non Verbal Imitation
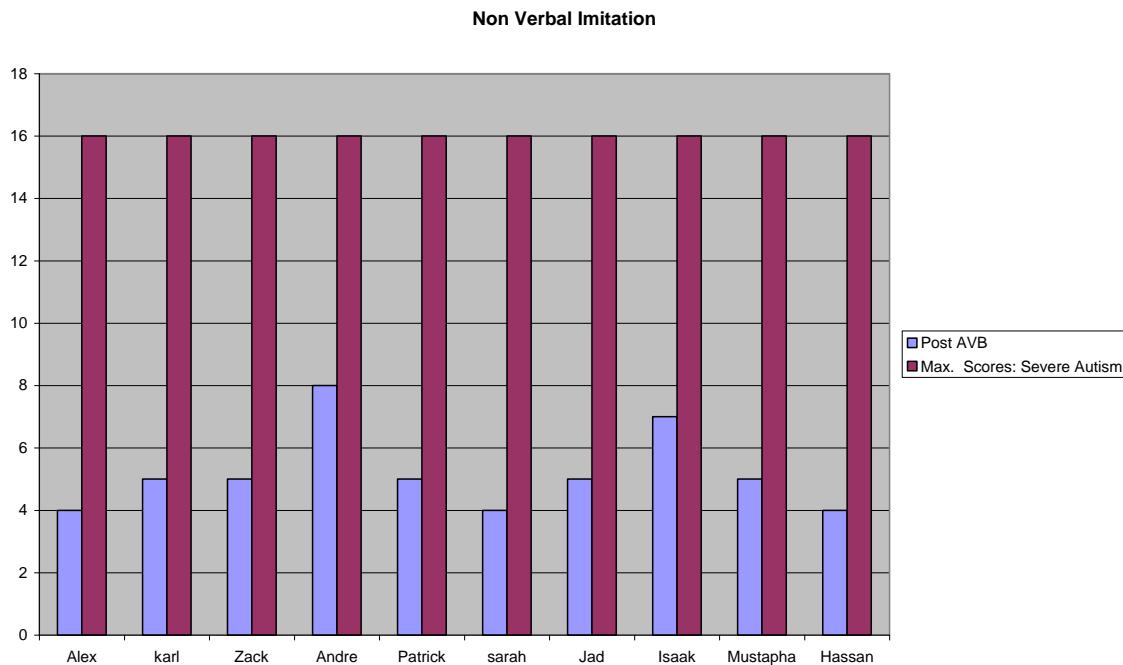
Figure (6.15) Non Verbal Imitation

10. Matching and Sorting

The matching and sorting programme involves matching:

- 3D to 3D
- 2D to 2D
- 3D to 2D; 2D to 3D.

- Non identical objects or pictures.

- Letters, numbers.

- Associative matching.

- Blocks sequence.

In the matching and sorting programme, the children have made significant improvement as indicated in figure (6.16). Alex, Karl, Zack, Jad, and Mustapha have improved by 27 points; Patrick and Sarah have improved by 25 points; Hassan has improved by 24 points; Andre and Isaac have improved by 20 points.

Matching and Sorting
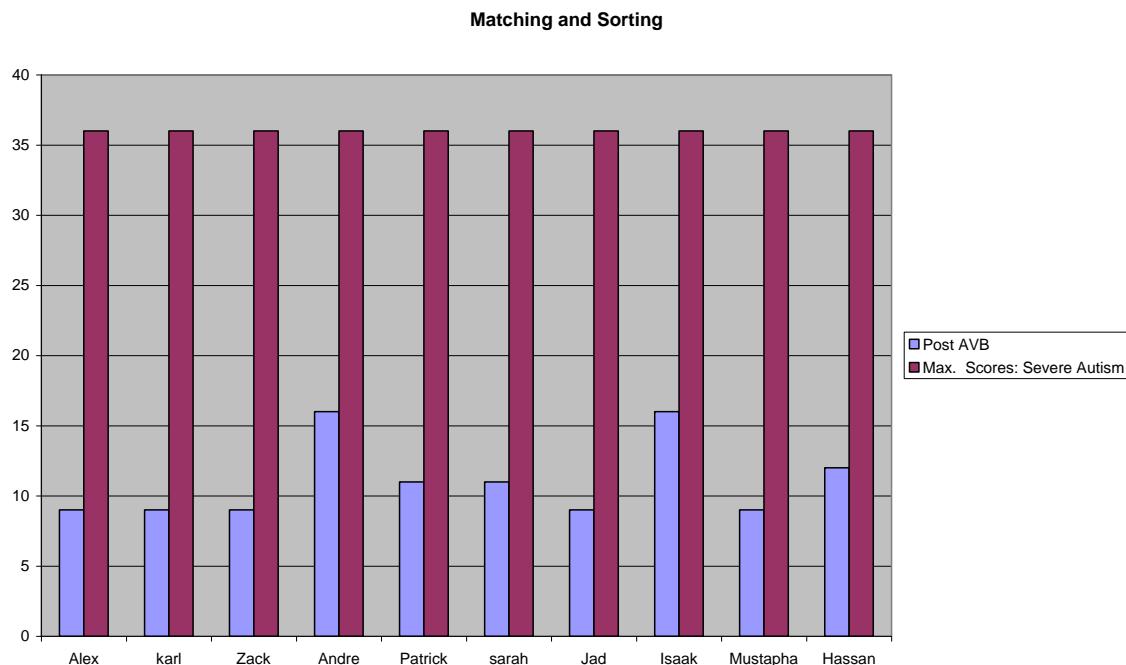
Figure (6.16) Matching and Sorting

11. Play Skills

The play skills programme involves the child to do:

- Puzzles, ball play,

- Sharing and taking turns.

- Pretend play.

- One to one playmate.

- Board games.

- Group peer play.

- Helping others.
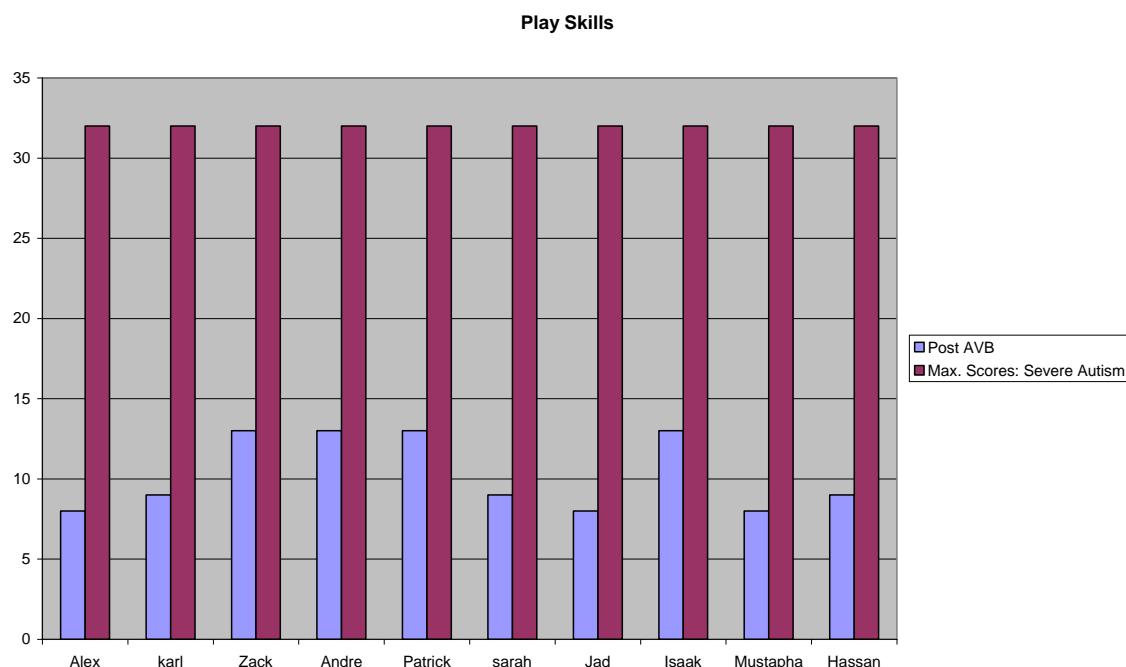
Play Skills

Figure (6.17) Play Skills

In the play skills programme, the children have shown significant improvement as indicated in figure (6.17). Alex, Jad and Mustapha have improved by 24 points; Karl, Sarah and Hassan have improved by 23 points; Zack, Andre, Patrick and Isaac have improved by 19 points.

12. Object Labelling

Object labelling involves identifying:

- Receptive objects.

- Labels receptive actions.

- Labels expressive objects.
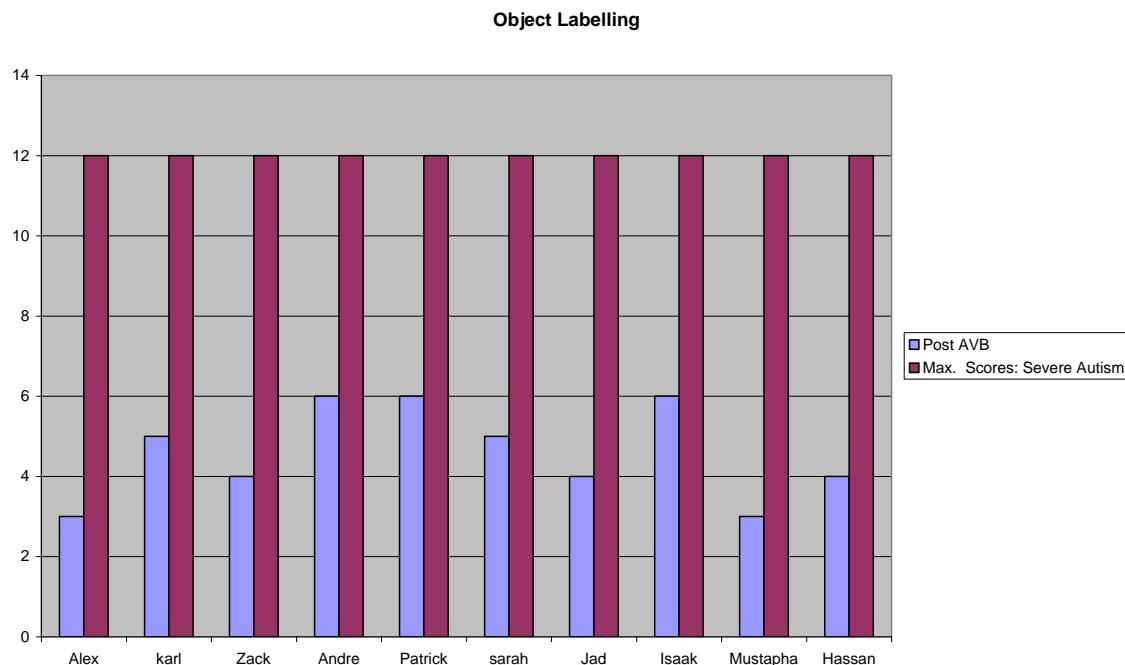
Object Labelling

Figure (6.18) Object Labelling

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In the object labelling programme, the children have made noticeable improvement as indicated in figure (6.18). Alex and Mustapha have improved by 9 points; Zack, Jad and Hassan have improved by 8 points; Karl and Sarah have improved by 7 points; Andre, Patrick and Isaac have improved by 6 points.

13. Verbal Imitation

The verbal imitation programme involves imitating:

- Sounds.

- Words syllables.

- Articulations.

- Volume and tones
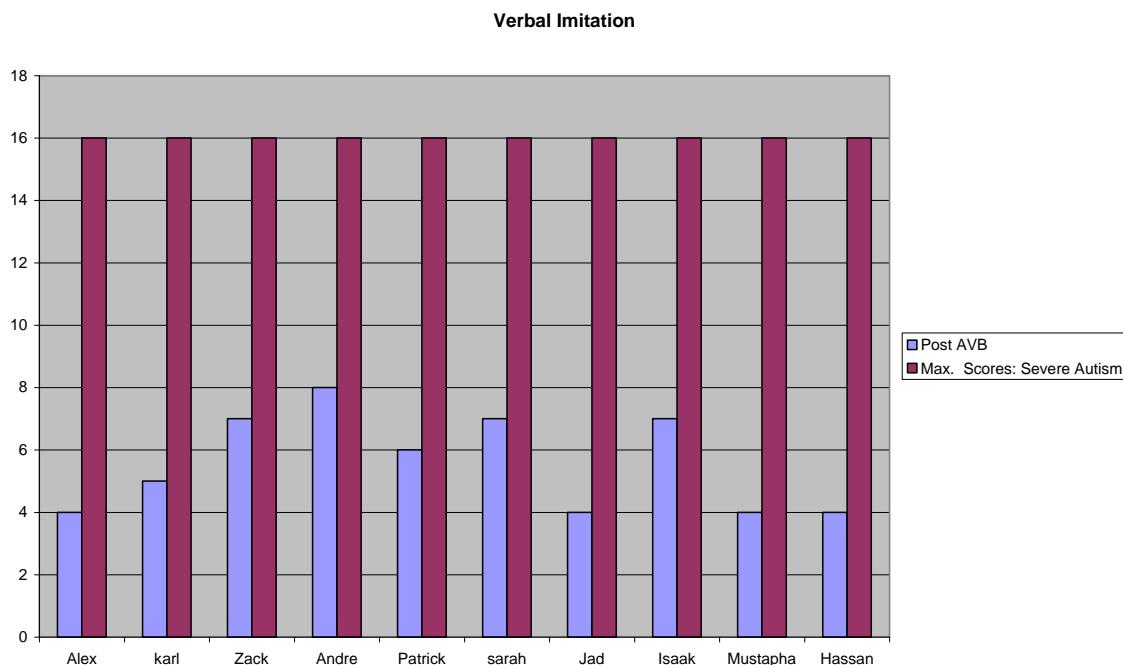
Figure (6.19) Verbal Imitation

In the verbal Imitation programme, the children had shown noticeable improvement as indicated in figure (6.19). Alex, Jad, Isaac and Hassan have improved by 12 points; Karl has improved by 11 points; Patrick has improved by 10 points; Zack, Sarah and Isaac have improved by 9 points while Andre has improved by 8 points only.

14. Abstract Concept

The abstract concept programme involves:

- Colours.

- Shapes.

- Size.

- Categories.
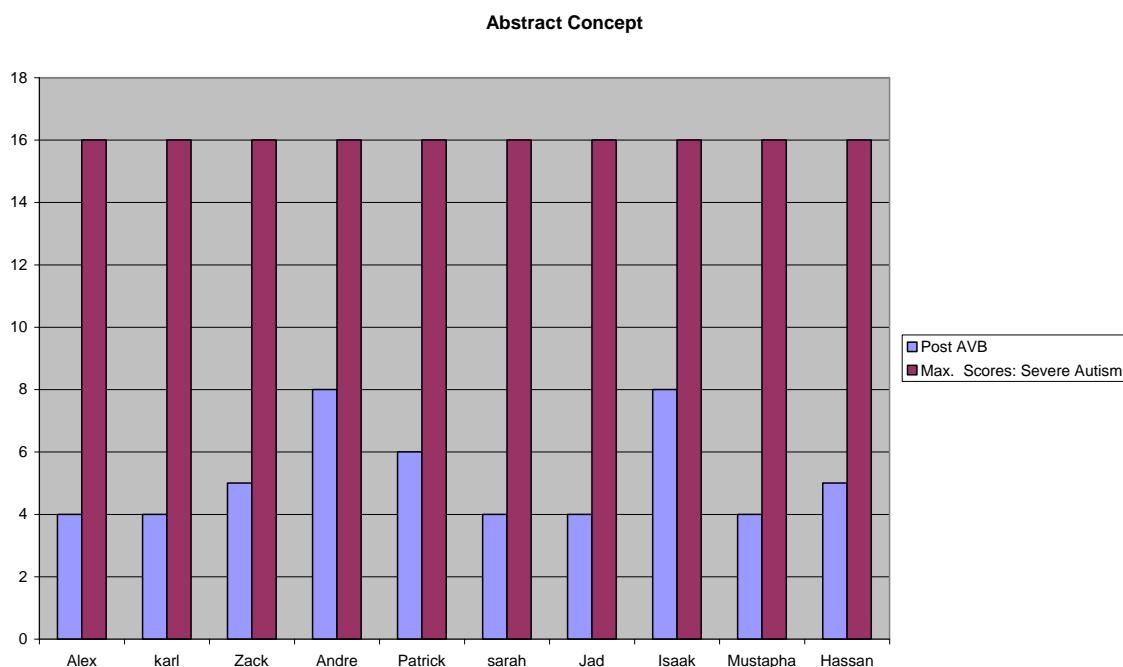
Figure (6.20) Abstract Concept

In the abstract concept programme, the children have made noticeable improvement as indicated in figure (6.20). Alex, Karl, Sarah, Jad and Mustapha have improved by 12 points; Zack and Hassan have improved by 11 points; Patrick has improved by 10 points; Andre and Isaac have improved by 8 points only.

15. Sentence Structure

The sentence structure programme involves using phrases and simple sentences by the child:

- I want
- I have
- I see

Sentence Structure
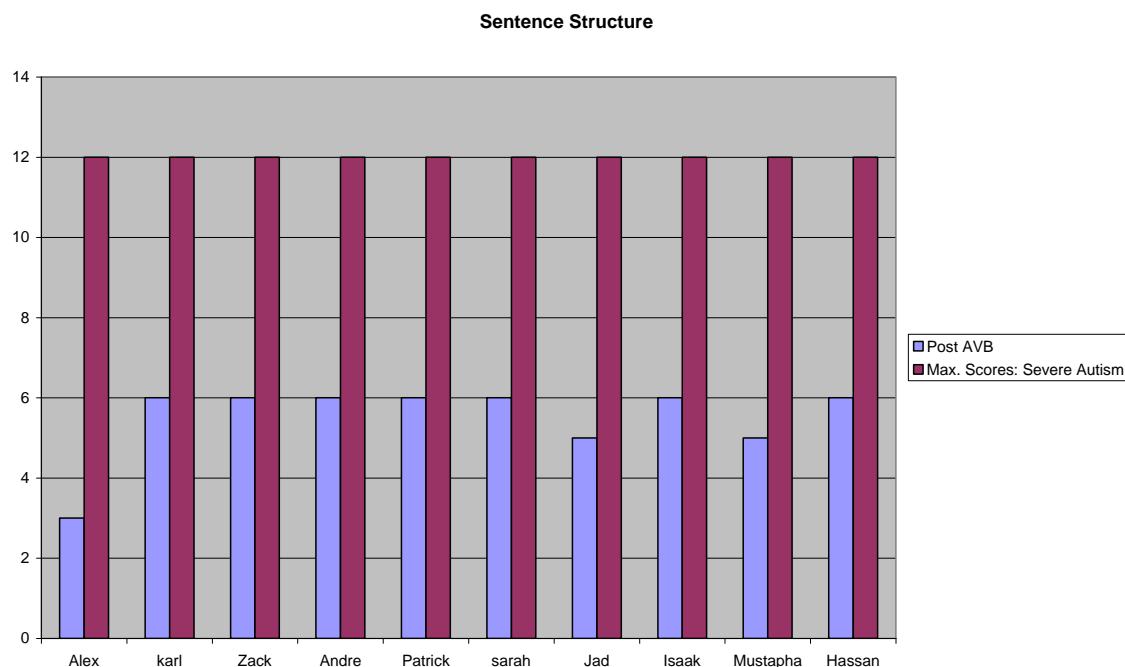
Figure (6.21) Sentence Structure

In the sentence structure programme, the children had shown significant improvement while others had less noticeable one, as indicated in figure (6.21). Alex has improved by 9 points; Jad and Mustapha have improved by 7 points; Karl, Zack, Andre, Patrick, Sarah, Isaac and Hassan have improved by 6 points only.

16. Academic Work

The academic work involves:

- Letters reading.

- Numbers and counting.

- Writing and drawing.

- Worksheets.

- Observation learning.

- Reading books.

- Spelling

- Circle time.

- Independent work

- Group activity works.

In the academic work performance, the children have made noticeable improvement as indicated in figure (6.22). Alex and Mustapha have improved by 30 points; Karl and Hassan have improved by 28 points; Jad has improved by 27 points; Zack has improved by 26 points; Sarah has improved by 25 points; Isaac has improved by 23 points while Andre has improved by 22 points.
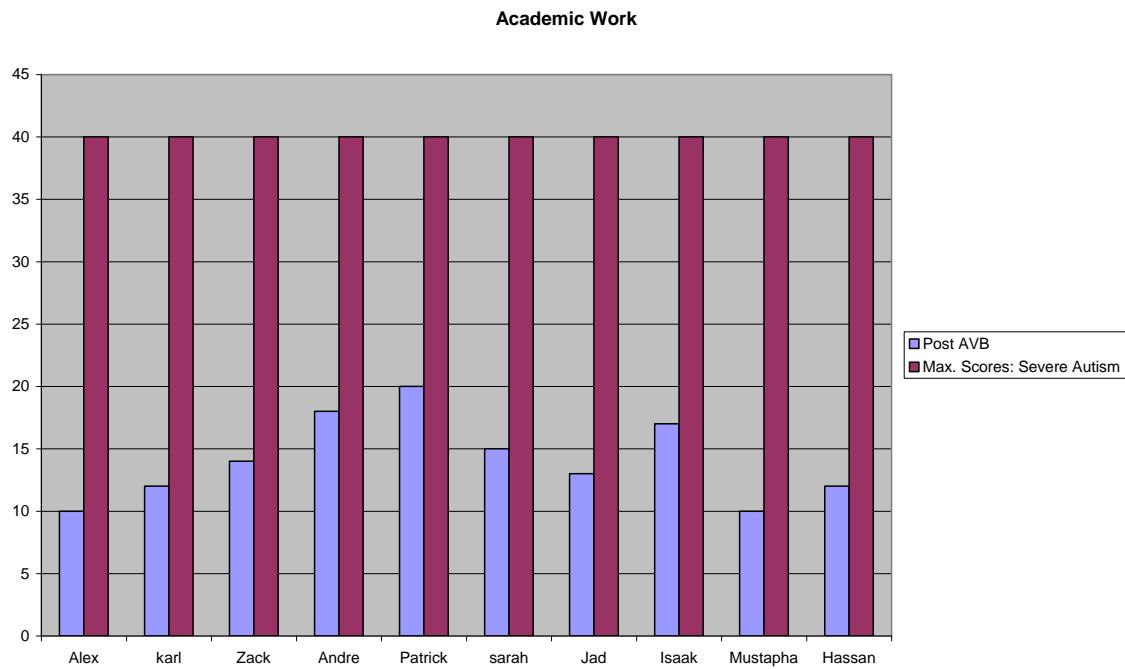
Academic Work

Figure (6.22) Academic Work

17. Social Repertoire

Social repertoire involves the following:

- Circle game.

- Greeting people.

- Social interaction

- Simple conversation.

- Getting and giving simple information.

- Play in same play area with peers without exhibiting disruptive behaviours.

In the social repertoire programme the children have made noticeable improvement as indicated in figure (6.23). Alex and Mustapha have improved by 18 points; Hassan has improved by 17 points; Andre and Jad have improved by 16 points; Karl, Sarah and Isaac have improved by 15 points; Zack and Patrick have improved by 14 points.
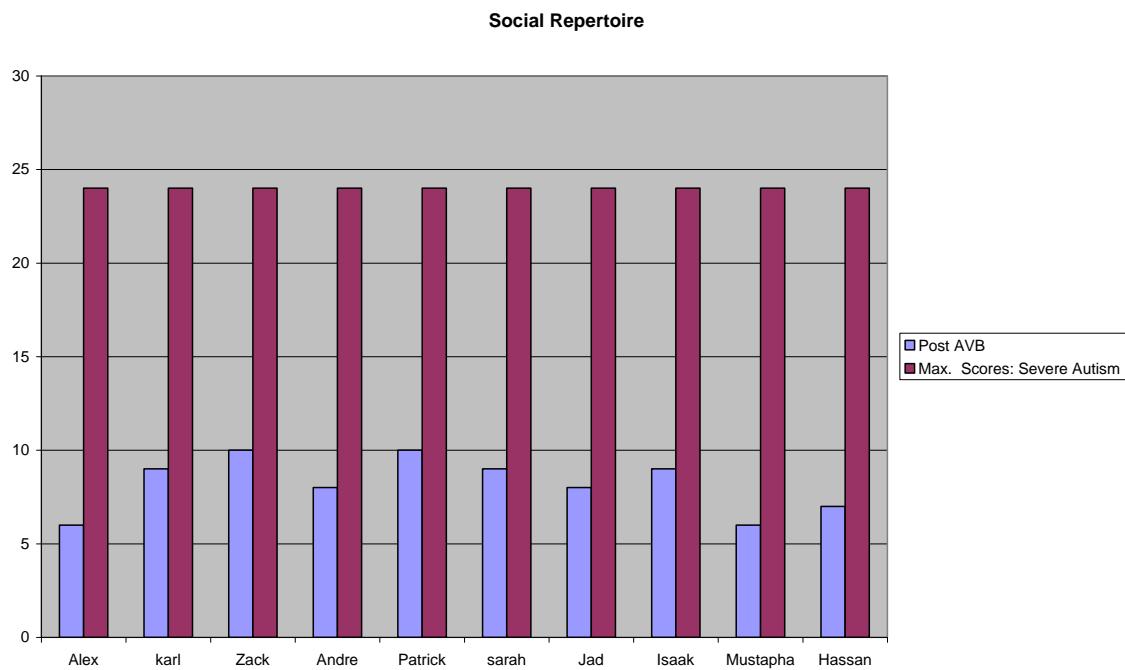
Social Repertoire

Figure (6.23) Social Repertoire

18. Self-Help Skills

Self-help skills involve the following:

- Dressing and undressing.

- Toilet independent; requesting to use toilet appropriately.

- Using fork and spoon to eat and knife to cut or spread.

- Drinks from a straw.

- Drinks from a cup without spilling.

- Using napkin.

- Swallows food before taking more food into mouth.

- Caries plate from and to table.

- Throws away leftovers.

- Hangs his coat, wear a hat

- Having a hair cut without disruptive behaviours.

- Washes and dries hands; brushes teeth and wipe nose.

- Tidy things away.
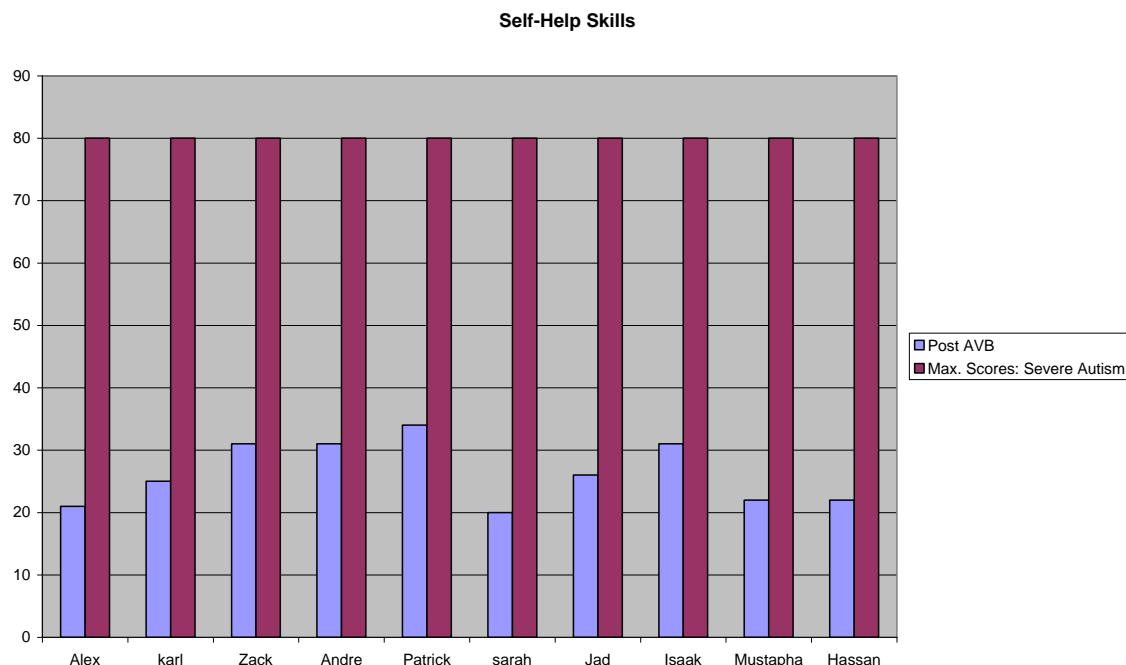
Self-Help Skills

Figure (6.24) Self Help Skills

In the self-help skills programme, the children have made significant improvement as indicated in figure (6.24). Sarah has improved by 60 points; Alex has improved by 59

points; Mustapha and Hassan have improved by 58 points; Karl has improved by 55 points; Jad has improved by 54 points; Zack, Andre and Isaac have improved by 49 points; while Patrick has improved by 46 points only.

To summarize this section, it can be seen from the results (the pre & post scores) above that the children have shown significant improvement from their teachers' perspectives in the following areas: behavioural, compliance, waiting, performing skills in different situations, receptive language, receptive behaviours, expressive behaviours, social Intraverbals, non verbal imitations, matching and sorting, play skills, object labelling, verbal imitation, abstract concept, sentence structure, academic works, social repertoire, and self help skills.

6.3.4 Section 4 Personal View of Teachers

Personal view section had closed typed questions and open ended one. As for the closed typed one which involves responding to questions regarding the AVB programme and the respondent experience with it, the coding for this type of questions is done by:

- Assigning 3 points for answering "No".

- Assigning 2 points for answering "Not sure".

- Assigning 1 point for answering "Yes".

Children's post AVB intervention scores is compared to the maximum scores of the specific programme and improvement is obtained by subtracting children's post scores

from the maximum scores of the programme. The reader is reminded that lower scores indicate improvement in the children's performance.

According to the teachers' evaluation of the children progress and development, it can be seen that from their responses that the children have shown significant improvement in their performance as indicated in figure (6.25), and they have become much easier to deal with and more co-operative. All the children have improved by 18 points except Zack who has improved by 17 points.
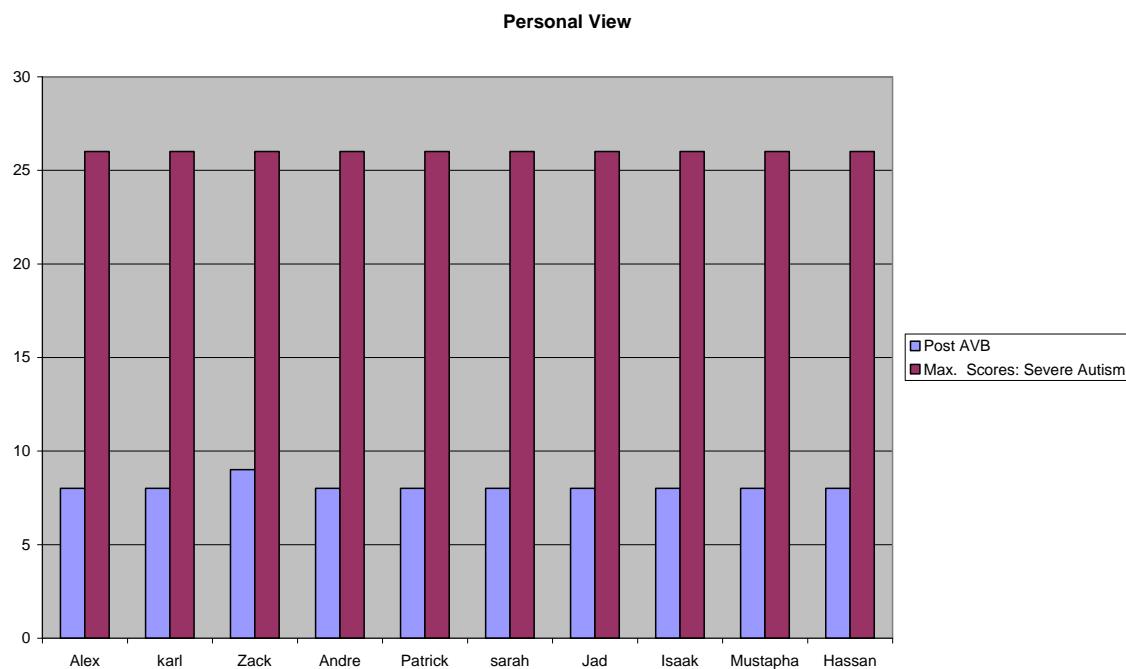
Personal View

Figure (6.25) Personal View

In summary, it can be seen from the figure (6.27) that all the children have shown significant improvement according to their teachers' evaluation.

As for the open-ended questions, they are going to be discussed in chapter 7.

Figure (6.26) gives the rate of improvement of the children's performance of specific skills by their teachers. The rate of improvement of each child varied from 32.64% to 60.39%. Although, the lowest rate of improvement was assigned to Alex, he scored 155 out of 775 which put him in category of distinguished progress. Bearing in mind that Alex has scored in the moderate autism category (pre-AVB) by an independent psychologist (using CARS) and later he has scored in the non autistic category (post AVB). The rate of improvement for the rest of children was varied from 50.22% to 60.39%. This results show that the majority of children have shown a significant improvement according to their teachers' evaluation.

Names of the children	Pre AVB	% Pre	Post AVB	% Post	% Rate of Improvement
Alex	408	52.64	155	20	32.64
Karl	682	88	214	27.61	60.39
Zack	649	83.74	227	29.29	54.45
Andre	685	88.38	255	32.9	55.48
Patrick	663	85.54	244	31.48	54.06
Sarah	634	81.80	208	26.8	55.1
Jad	645	83.22	207	26.7	56.52
Isaac	676	87.22	287	37	50.22
Mustapha	595	76.77	180	23.2	53.57
Hassan	637	82.19	191	24.6	57.59
Max Scores	775	100	775	100	100

Figure (6.26) Teacher's Evaluation of their Children
Percentage of Improvement Out of Maximum Score
Higher Pre & post AVB percentage indicates severe autism

**Total Pre & Post Score
of Children Evaluation Form by Their Teachers**
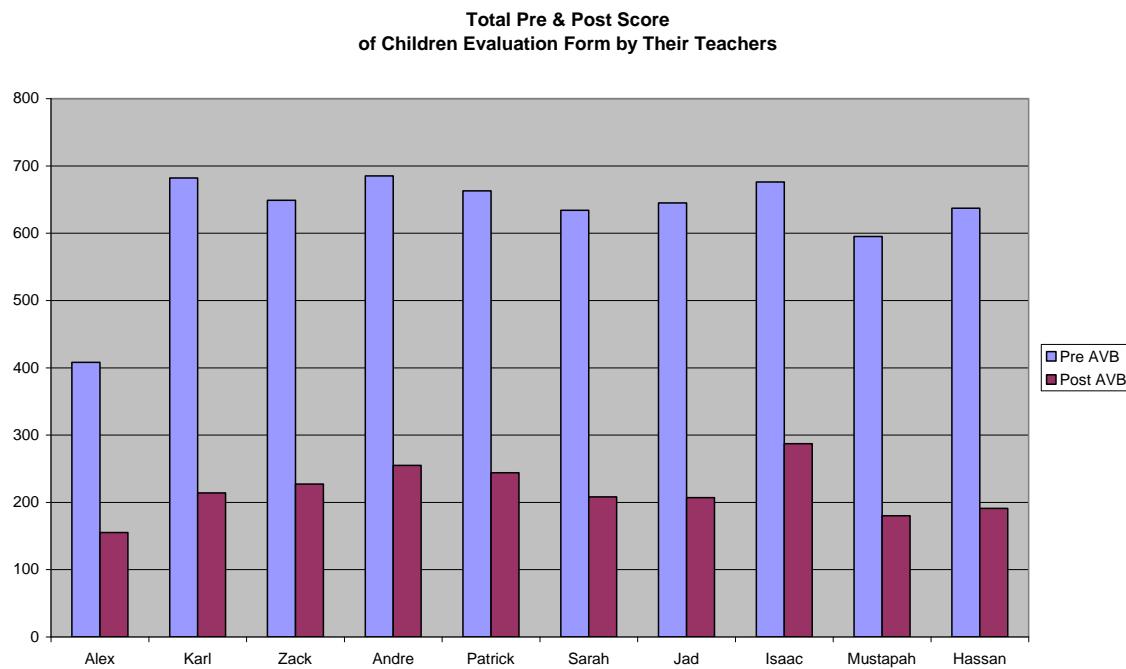
Figure (6.27) Total pre & post score of children evaluation form by their teachers

6.3 Evaluation Form by Parents

6.3.1 Section 1 Personal Details

This section is regarding the children's age and their gender which is the same as mentioned earlier in the teachers' evaluation section. The degrees of the children disability and how they are affected by it will be discussed here.

1. In the parent's opinion, how affected by his/her disability is the named child?

On a scale from 1 to 8, the parents are judging the degree to which each child is affected by his/her disability. From the parents' perspective "1" means the child is mildly affected by disability and "8" means the child is severely affected by disability.

1(least)   2   3   4   5   6   7   8(most)

Parent's evaluation is about how the children are affected by their disability i.e. autism. As is shown in figure (6.28), higher scores indicate severe autism. This figure indicates according to the parents, that their children have made progress. In figure (6.26), 8 are the max level score which indicates severe type of autism. Alex has scored 5 as pre- AVB intervention, later he scored 3 post AVB intervention where he has improved by 2 points while Karl has scored 6 as pre- AVB intervention, later he scored 3 post AVB intervention where he has improved by 3 points. Patrick, Sarah, Jad, Mustapha and Hassan have scored 6 as pre AVB intervention, and later they scored 4 post AVB interventions and have improved by 2 points.
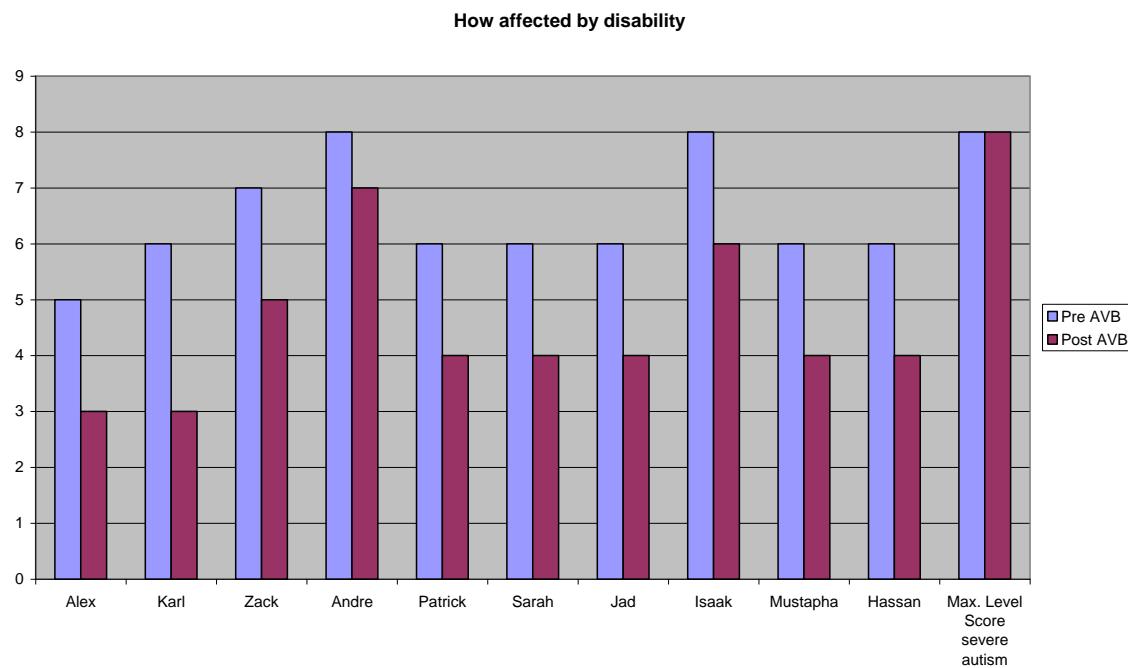
Figure (6.28) Parent's scores of their children disability.

Andre and Isaac both have scored 8 as pre- AVB intervention and later Andre scored 7 where he improved by 1 point while Isaac scored 6 where he improved by 2 points. Zack has scored 7 as pre- AVB intervention and scored 5 as post AVB intervention where he has improved by 2 points

6.3.2 Section 2: Behaviour

Section 2 describes the children's behaviours after the implementation of the AVB Programme. Coding is done by assigning a score to each item (see Appendix).

1. Aggressive and Self-Injurious Behaviours
Does the child display any self-injurious behaviour or aggressive behaviour towards others?

In the aggressive and self-injurious behaviours, only 3 children did exhibit these types of behaviours. The children have made significant improvement from pre-AVB intervention scores as shown in figure (6.29) where Karl has improved by 19 points while Zack has improved by 12 points and Jad has improved by 11 points.

Aggressive and Self-Injurious Behaviours
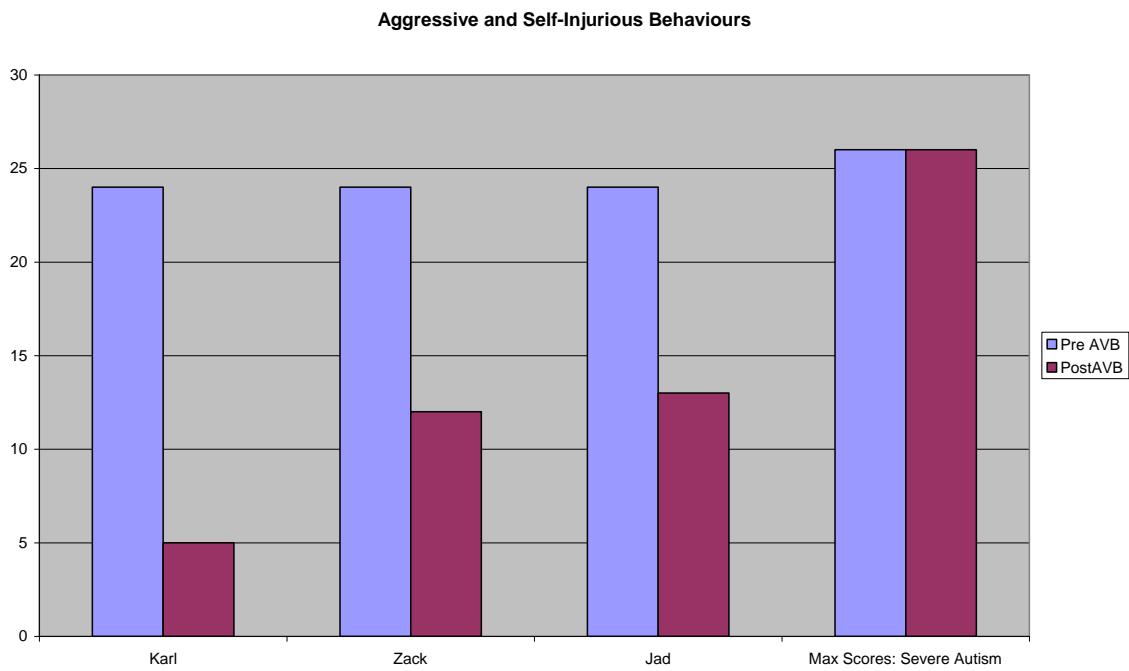
Figure (6.29) Aggressive and Self – Injurious Behaviours

2. Types of Self-Stimulatory Behaviours

Children with autism may engage in self-stimulatory behaviours such as sucking and mouthing clothes, closing and opening doors, spinning and flapping objects etc… The sensory mechanisms which are being stimulated for each behaviour are indicated as follows verbal, oral, gross motor, Olfactory (smell) and Tactile (feel).

In these types of self – Stim Behaviours, the children have shown an improvement as indicated in figure (6.30). However, as it can be seen from figure (6.28), the maximum level scores for self-stim behaviours is 35 while the pre maximum scores the children had exhibited was only 6 which indicates that there isn't many types of self-stim behaviours that the children did exhibit. Karl, Andre and Isaac self-stim behaviours did not change

while others did, such as Hassan who has improved by 4 points and Zack who has improved by 3 points. Jad has improved by 2 points while Alex, Zack, Sarah, and Mustapha have improved by1 point.

Self-Stim Behaviours
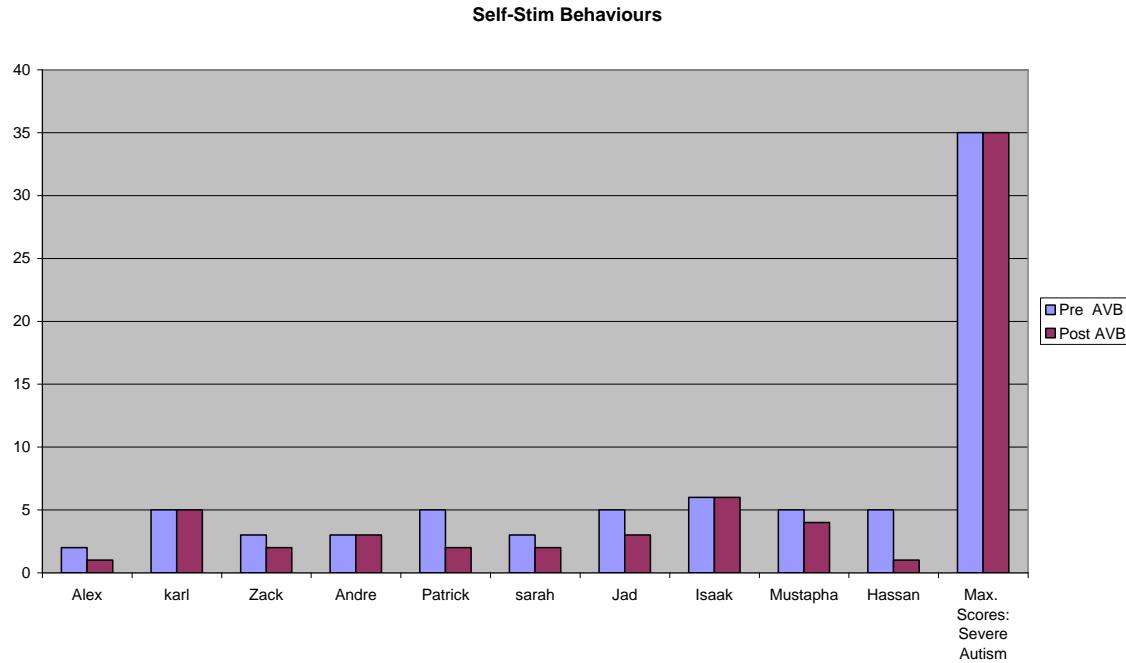
Figure (6.30) Self – Stim Behaviours

3. Sources of triggers of Self-Stim Behaviours:

The sources of triggers of Self-Stim Behaviours, as indicated in figure (6.31) shows the improvement the children have made in comparison to pre- AVB scores.
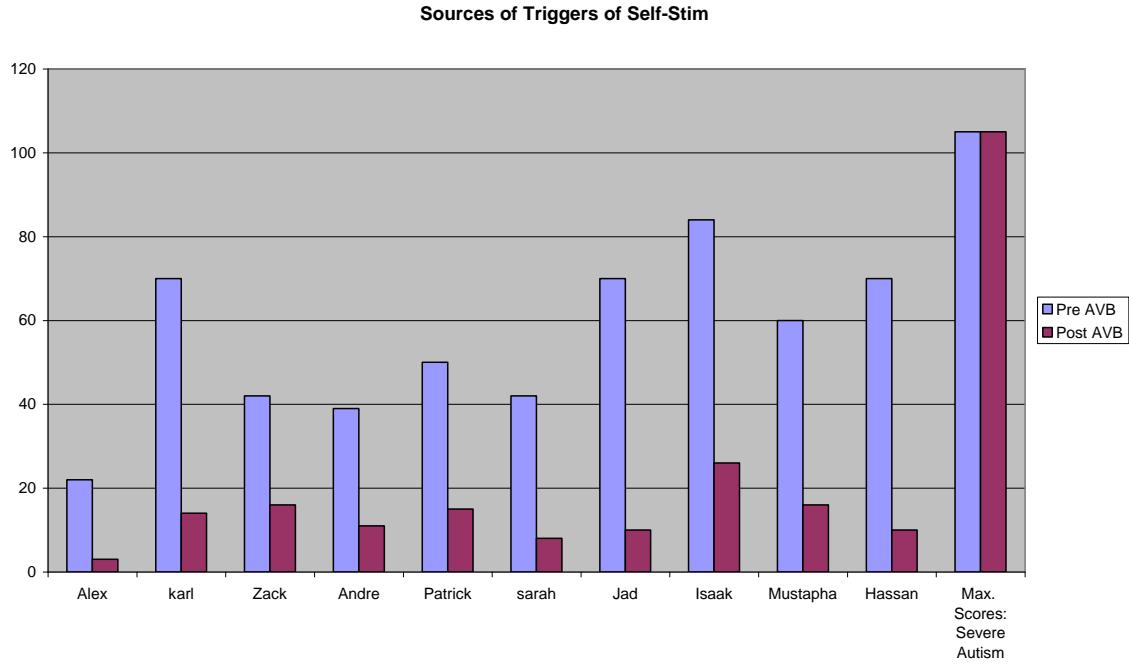
Figure (6.31) Sources of Triggers of Self-Stim

The occurrence of the self-stim of children with autism might be triggered when the child is excited, frustrated, under-stimulated, rarely or for some other reasons. Jad and Hassan have improved by 60 points; Isaac has improved by 58 points; Karl has improved by 56 points; Mustapha has improved by 44 points; Patrick has improved by 35 points; Sarah has improved by 34 points; Andre has improved by 28 points; Zack has improved by 26 points; Alex has only improved by 19 points.

4. The Frequency of Self-Stim per day

Regarding the question of how many times per day did the self-stim behaviours occur, It can be seen from figure (6.32) that the children have made significant improvement in this field.
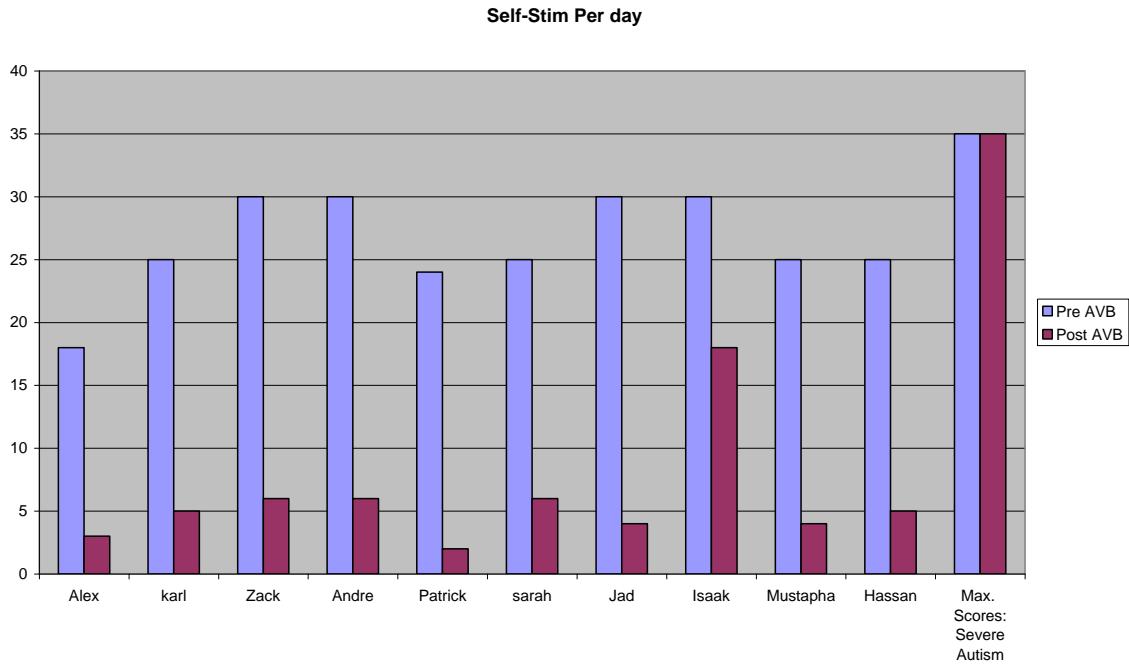
Figure (6.32) Self – Stim per Day

Jad has improved by 26 points, while Zack and Andre have improved by 24 points. Patrick has improved by 22 points, Sarah and Mustapha have improved by 21 points, Karl and Hassan have improved by 20 points, and Alex has improved by 15 points while Isaac has improved by 12 points.

In summary, according to parents all the children have shown significant progress in the areas concerning their aggressive or self stim behaviours and the frequency of the occurrence of these types of behaviours.

6.3.3 Section 3 Progress and Development:

This section asks about any behavioural or physical change in the child which can be attributed to the AVB programme.

1. Behavioural Changes

Have you noticed any behavioural or physical changes in your child whom you can attribute to the AVB programme?

To answer the above question, the parents are provided with 4 categories:

- Regressed

- No change

- Significant improvement

- N/A

The children's behaviours are observed by their parents such as tantrums, self- abused, aggression, self-stim, leaving work area, following simple direction etc…

As for the behavioural changes the children have exhibited, figure (6.33) indicates the improvement the children have made. Alex has improved by 42 points while Karl and Andre have improved by 40. Patrick, Sarah, Isaac, Mustapha and Hassan have improved by 39 points while Jad has improved by 38 points. Zack has improved by 34 points.
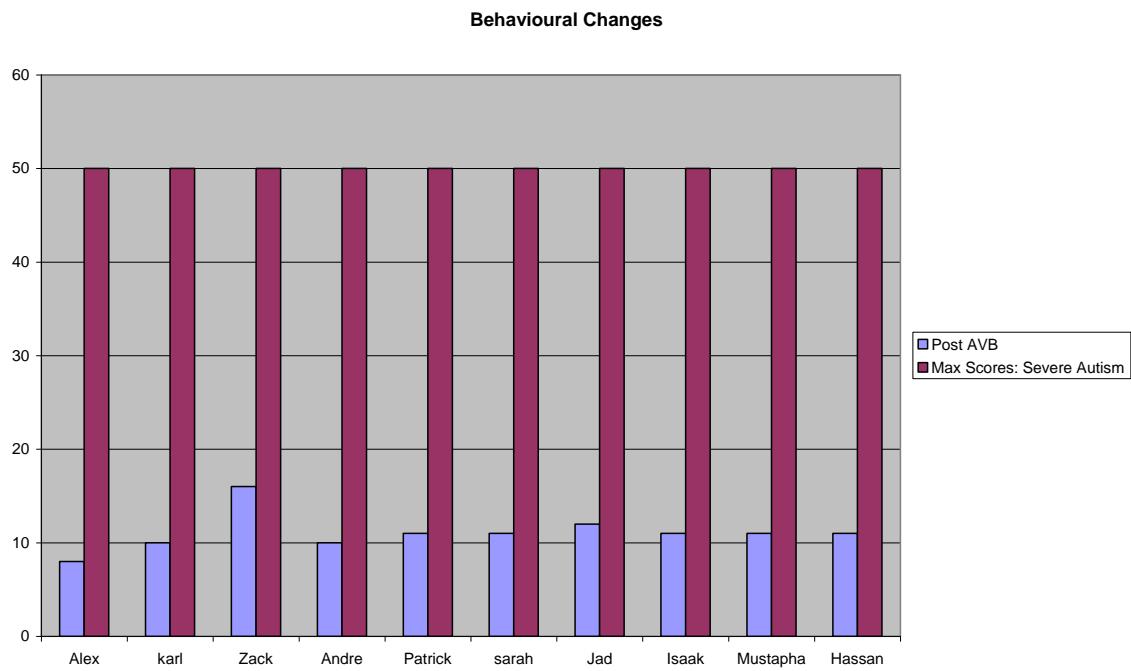
Figure (6.33) Behavioural Changes

2. Compliance

The compliance programme involves getting the child to come over when called, following simple instructions and retrieving objects upon request. All the children have made significant improvement as indicated in figure (6.34). Alex, Jad, Mustapha and Hassan have improved by 36 points; Karl has improved by 34 points; Zack and Isaac have improved by 33 points; Sarah has improved by 32 points; Patrick has improved by 31 points; Andre has improved by 30 points.
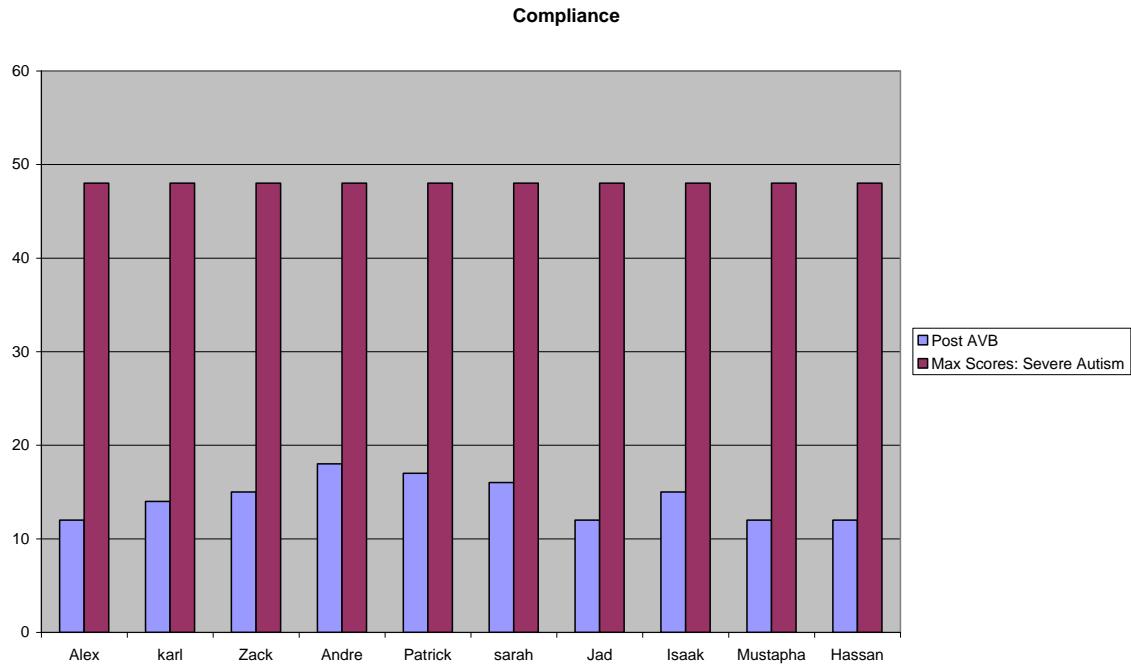
Compliance

Figure (6.34) Compliance

3. Waiting

The waiting programme involves getting the child to wait appropriately before s/he can get a reinforcer and teaching him/her to take turns in preferred activities. All the children have shown dramatic improvement in this area as indicated in figure (6.35). Alex, Karl, Zack, Andre, Sarah, Jad, Mustapha and Hassan have improved by 12 points while Isaac has improved by 11 points and Patrick has improved by 9 points.
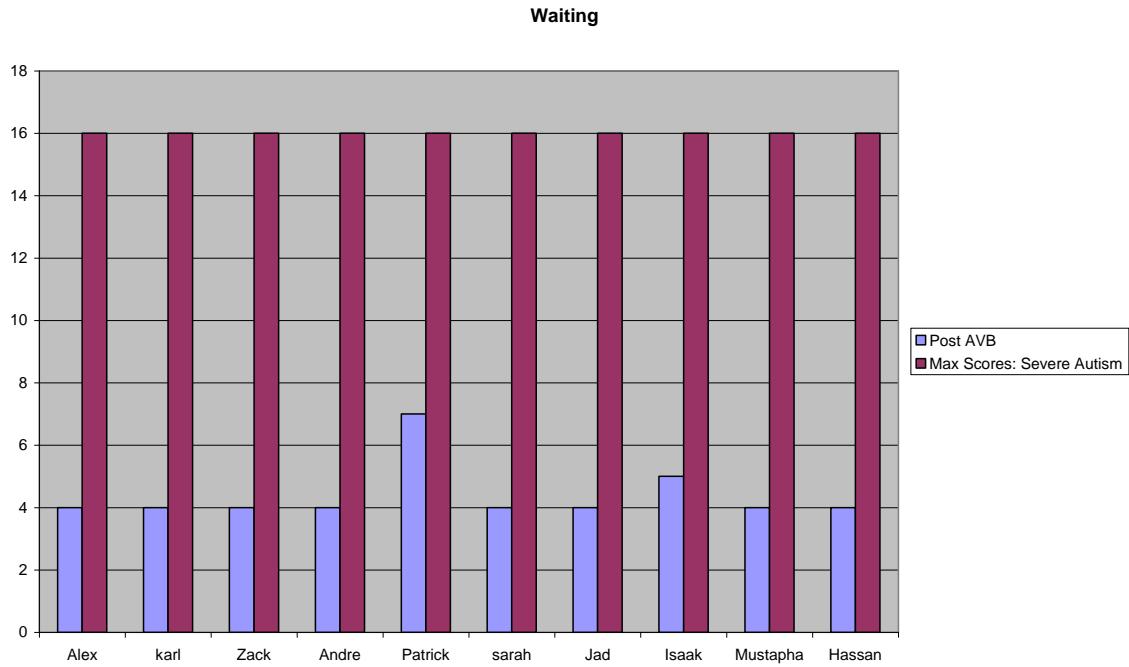
Waiting

Figure (6.35) Waiting

4. Performing Skills in Different Situations

The performing skills in different situations programme involve getting the child to perform a skill with different children and people and in different places, and to generalize appropriate behaviour and compliance in many different settings. Figure (6.36) shows that all the children have significantly improved by 12 points except Isaac who had improved 8 points only.
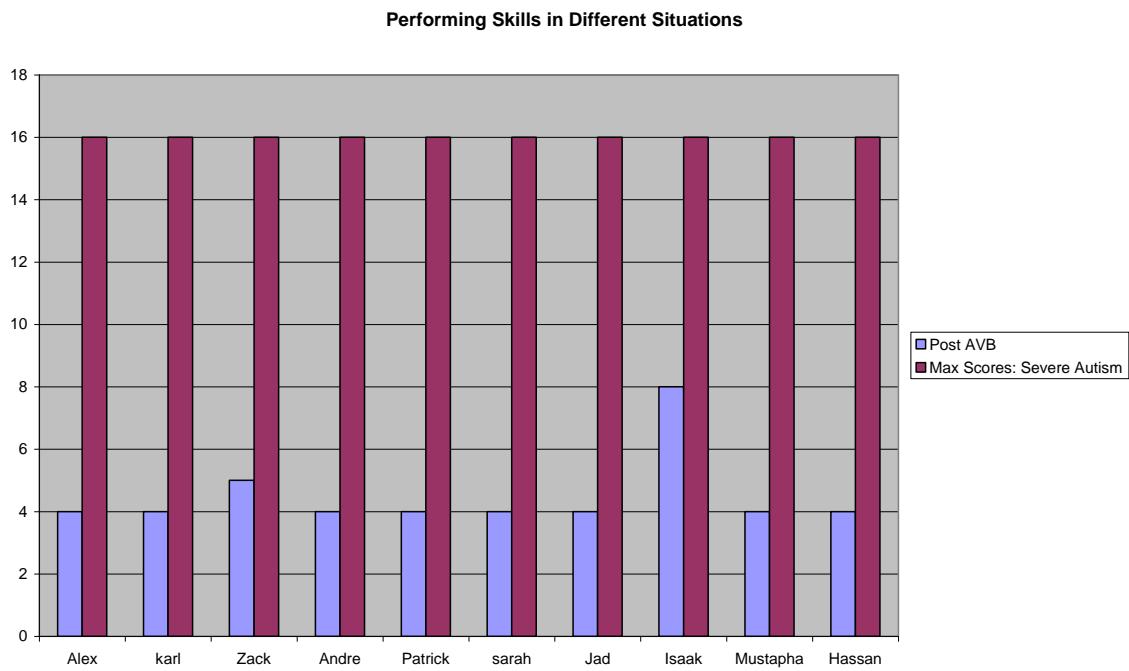
Figure (6.36) Performing Skills in Different Situations.

5. Receptive Language

The receptive language programme involves getting the child to following simple instructions such as coming over when called, sitting down, responding to his name and going to a named person upon request. All the children have made significant improvement in this area as indicated in figure (6.37). Alex, Karl, Zack, Andre, Sarah, Jad and Mustapha have improved by 15 points while Patrick, Isaac and Hassan have improved by 14 points.
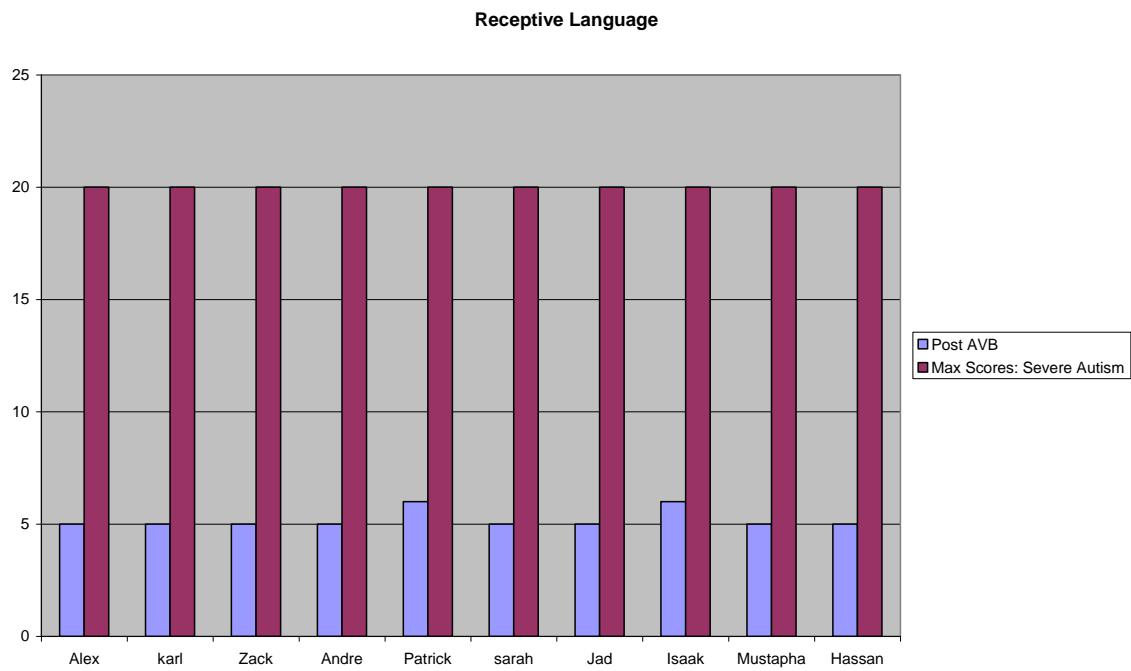
Figure (6.37) Receptive Language

6. Receptive Behaviours

The Receptive Behaviours programme involves the child to sit appropriately and maintain eye contact while communicating, imitating non verbal movements, and following instructions in receptive commands etc…. All the children have shown significant improvement in this area as indicated in figure (6.38). Alex and Mustapha have improved by 30 points; Zack has improved by 29 points; Karl has improved by 28 points; Hassan has improved by 26 points; Sarah and Jad have improved by 25 points; Andre and Patrick have improved by 24 points and Isaac has improved by 22 points.
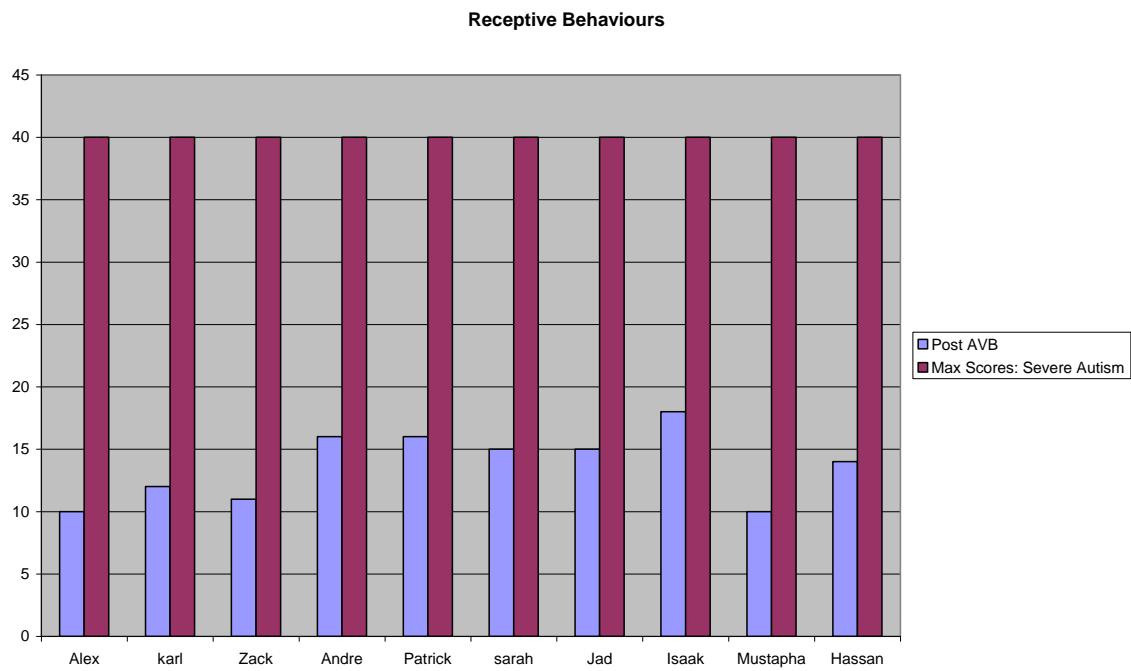
Figure (6.38) Receptive Behaviours

7. Expressive Behaviours

The expressive behaviour programme involves the child to communicate with others using either gestures, words, signs or pictures. All the children have made noticeable improvement in this area as indicated in figure (6.39). Alex has improved by 57 points; Mustapha has improved by 55 points; Hassan has improved by 49 points; Jad has improved by 47 points; Zack has improved by 46 points; Sarah has improved by 44 points; Karl has improved by 43 points; Patrick and Isaac have improved by 40 points while Andre has improved by 39 points.
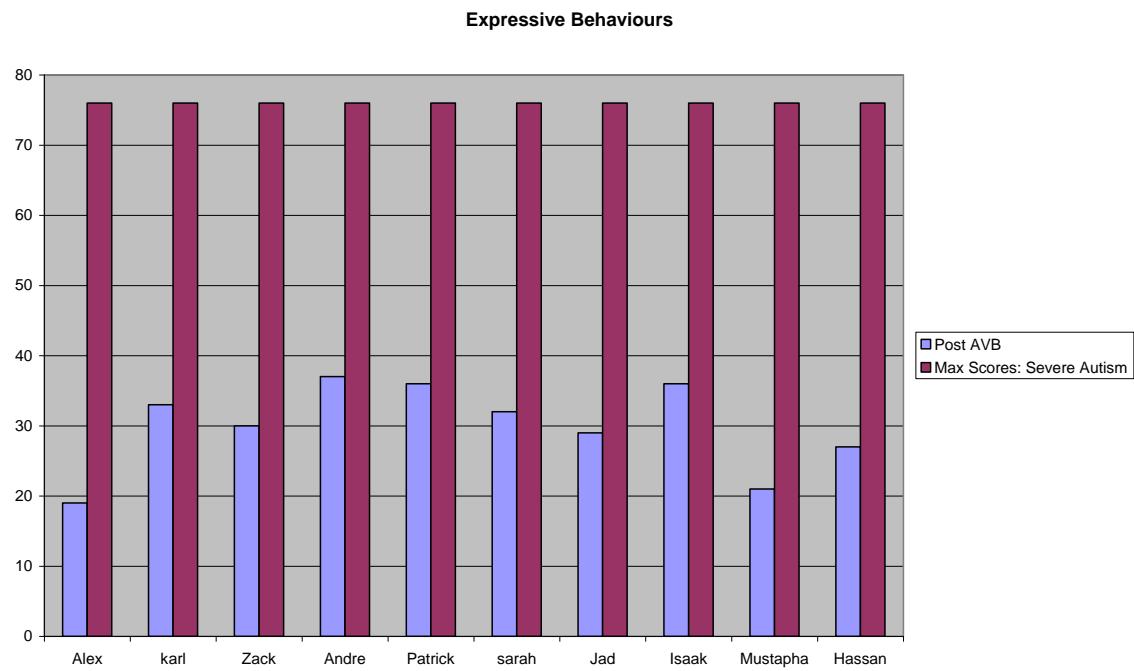
Figure (6.39) Expressive Behaviours

8. Social Intraverbals

The social Intraverbals programme involves the child to greet others and responds appropriately to greeting and saying common nursery rhymes or sing songs. The children have made noticeable improvement in this area as indicated in figure (6.40). Alex, Karl and Mustapha have improved by 12 points; Zack has improved by 11 points; Sarah, Jad and Hassan have improved by 10 points; Patrick and Isaac have improved by 9 points while Andre has improved by 8 points.
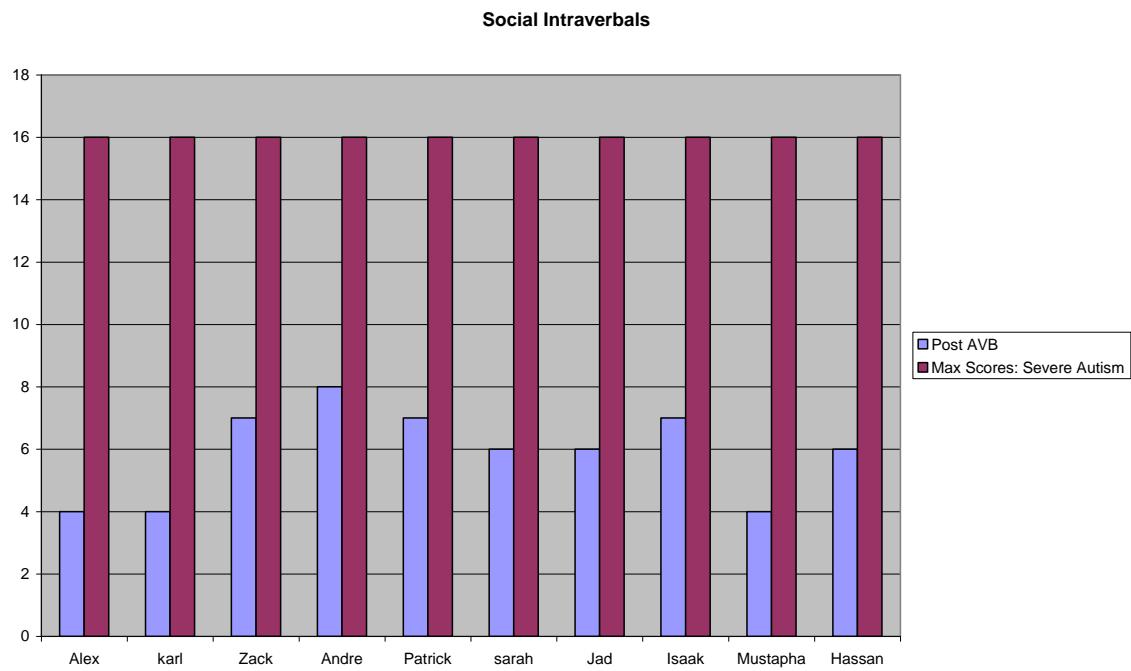
Figure (6.40) Social Intraverbals

9. Non- Verbal Imitation

The non-verbal imitation programme involves getting the child to do some gross, fine and oral motor movements in addition, to demonstrate non verbal imitation actions using objects and chaining. The children had made significant improvement in this area as indicated in figure (6.41). Alex, Sarah and Hassan have improved by 12 points; Karl, Zack, Patrick, Jad and Mustapha have improved by 11 points; Isaac has improved by 9 points while Andre has improved by 8 points.
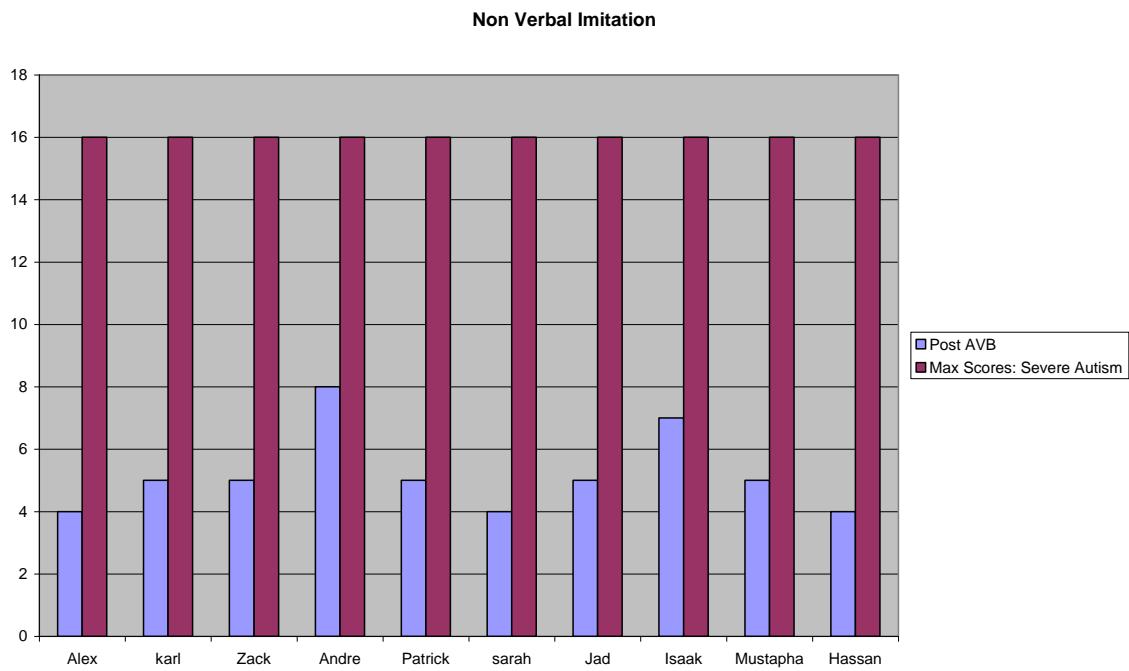
Figure (6.41) Non Verbal Imitation

10. Matching and Sorting

The matching and sorting programme involves the child to do objects and pictures matching, associative matching, letters and numbers and matching blocks sequence. The children had shown significant improvement in this area as indicated in figure (6.42). Alex, Karl, Zack, Jad and Mustapha have improved by 27 points; Sarah has improved by 25 points, Hassan has improved by 24 points, Patrick has improved by 21 points; Andre and Isaac have improved by 20 points.

Matching and Sorting
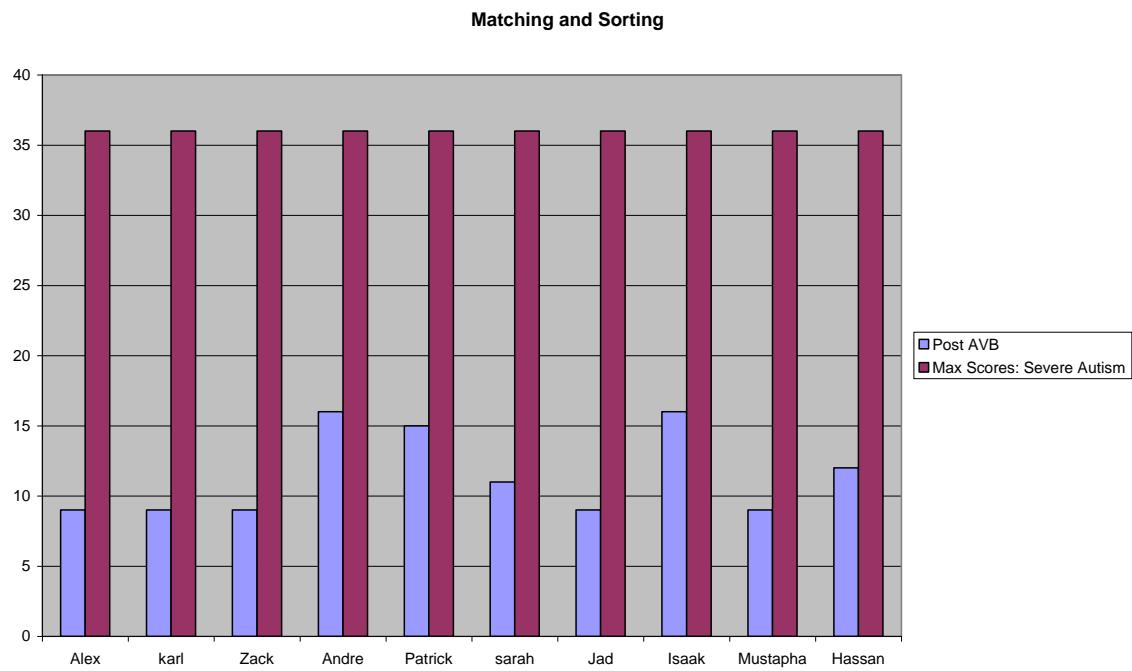
Figure (6.42) Matching and Sorting

11. Play Skills

The play skills programme involves the child to do puzzles, ball play, sharing and taking turns, board games, group and peer play. The children had made significant improvement in this area as indicated in figure (6.43). Alex, Jad and Mustapha have improved by 24 points; Karl, Sarah and Hassan have improved by 23 points; Zack has improved by 22 points; Andre has improved by 20 points while Patrick and Isaac have improved by 19 points.
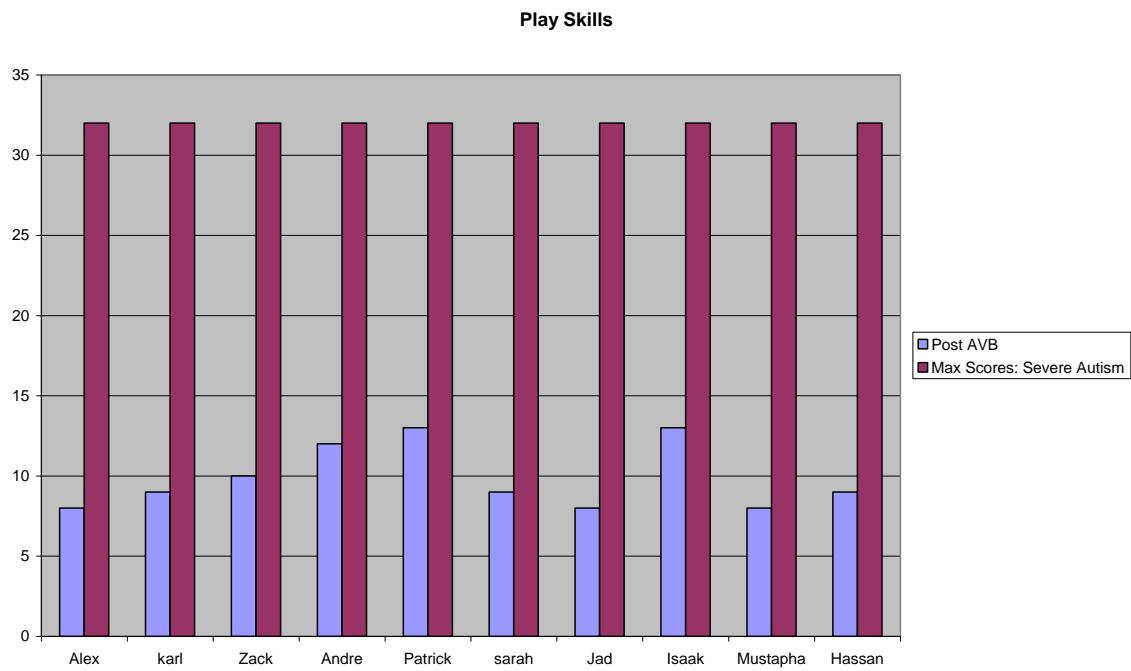
Play Skills

Figure (6.43) Play Skills

12. Object Labelling

The object labelling programme involves the child to follow instructions to identify receptive objects and labels actions and objects. The children have made noticeable improvement as indicated in figure (6.44). Alex and Mustapha have improved by 9 points; Zack, Jad and Hassan have improved by 8 points; Karl and Sarah have improved by 7 points while Andre, Patrick and Isaac have improved 6 points.
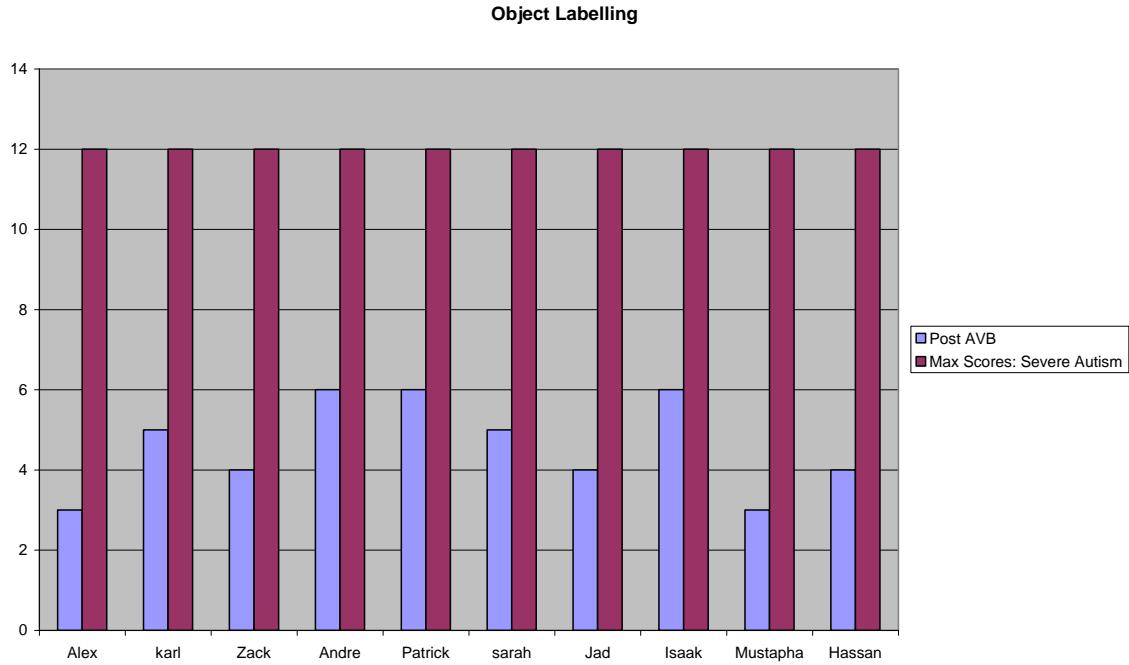
Figure (6.44) Object Labelling

13. Verbal Imitation

The verbal imitation programme involves the child to imitate sounds, words syllables, articulation and volume or tone. The children had shown noticeable improvement in this area as indicated in figure (6.45). Alex, Jad, Mustapha and Hassan have improved by 12 points; Karl and Patrick have improved by 10 points; Zack, Sarah and Isaac have improved by 9 points while Andre has improved by 8 points.
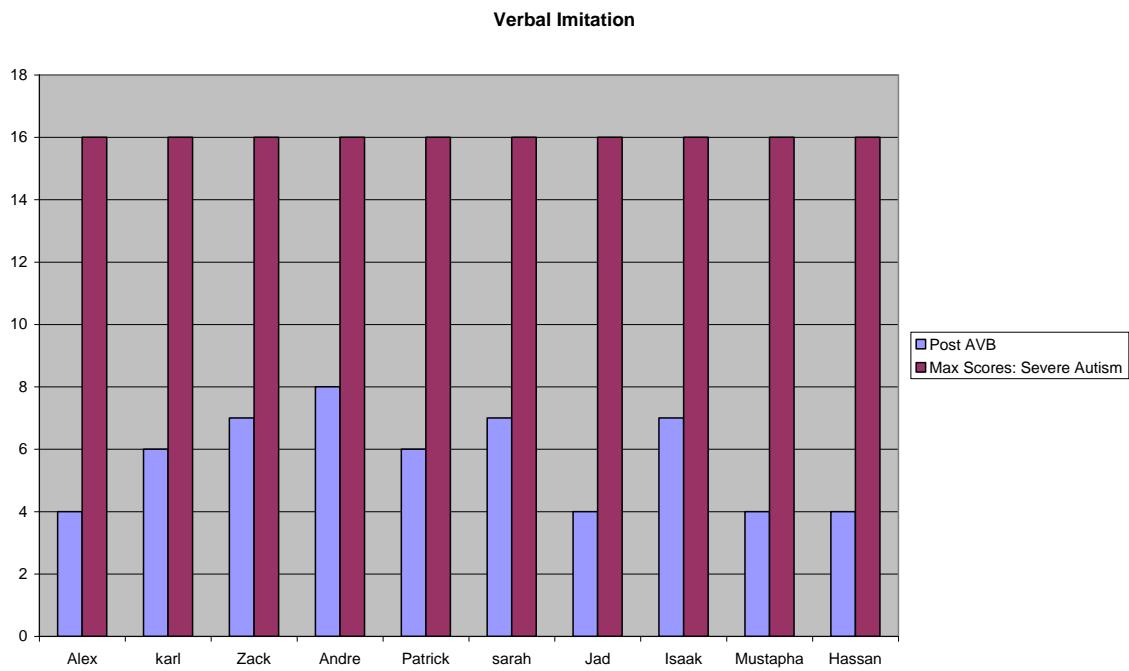
Verbal Imitation

Figure (6.45) Verbal Imitation

14. Abstract Concept

The abstract concept programme involves the child to recognize the abstract concept of colours, shapes, size and categories. The children have made noticeable improvement in this area as indicated in figure (6.46). Alex, Sarah, Jad and Mustapha have improved by 12 points; Zack and Hassan have improved by 11 points; Karl and Patrick have improved by 10 points while Andre and Isaac have improved by 8 points.
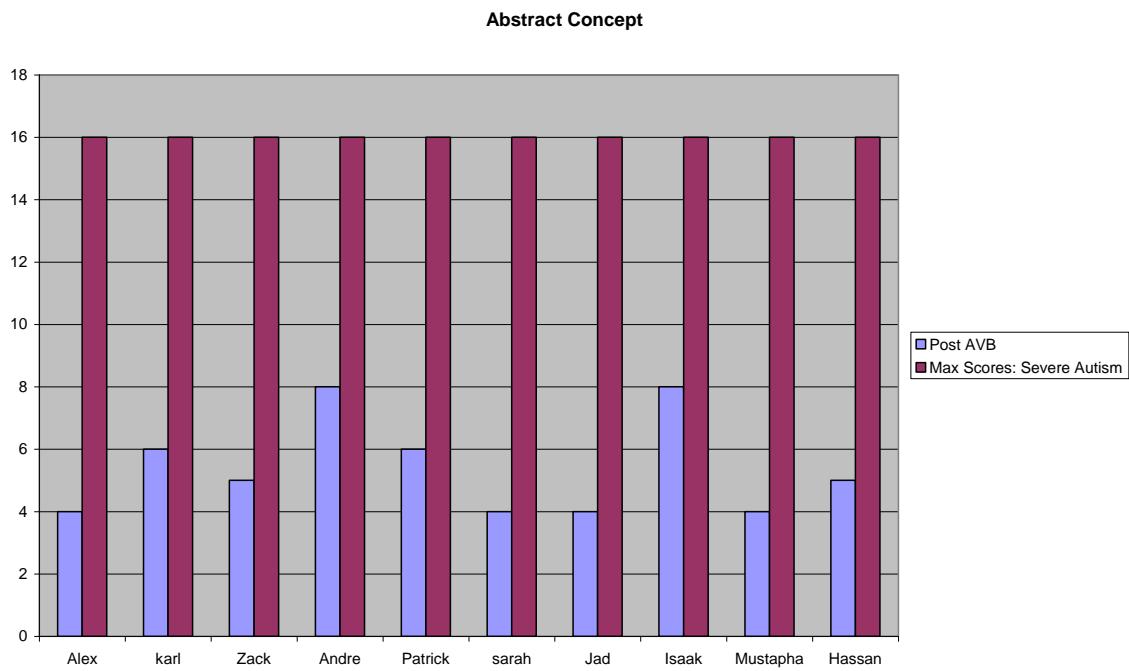
Abstract Concept

Figure (6.46) Abstract Concept

15. Sentence Structure

The sentence structure programme involves the child use simple sentences (words or signs) which have "I want; I have and I see"; the children had shown some improvement in this area as indicated in figure (6.47). Alex has improved by 9 points; Jad and Mustapha have improved by 7 points while Karl, Zack, Andre, Patrick, Sarah, Isaac and Hassan have improved by 6 points.
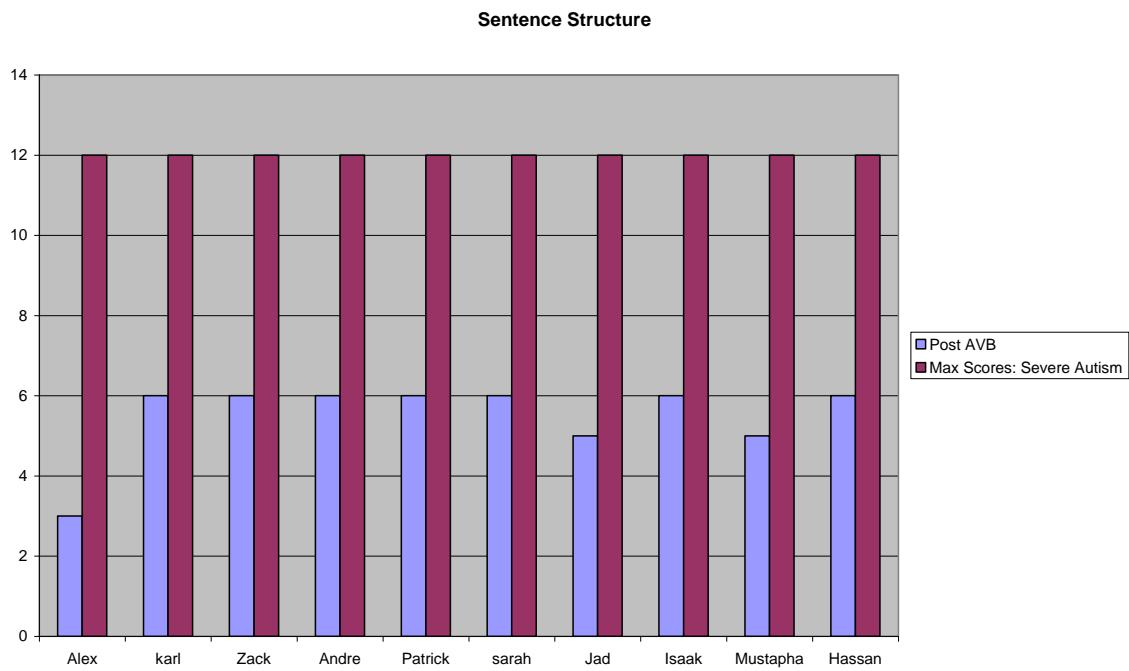
Figure (6.47) Sentence Structure

16. Academic Work

The academic work programme involves letters reading, numbers and counting writing and drawing, worksheets, books, spelling circle time, independent work and group activity works. The children have shown noticeable improvement in this area as indicated in figure (6.48). Alex and Mustapha have improved by 30 points; Hassan has improved by 28 points; Karl and Jad have improved by 27 points; Zack has improved by 26 points; Sarah has improved by 25 points; Isaac has improved by 23 points; Andre has improved by 22 points while Patrick has improved by 20 points.
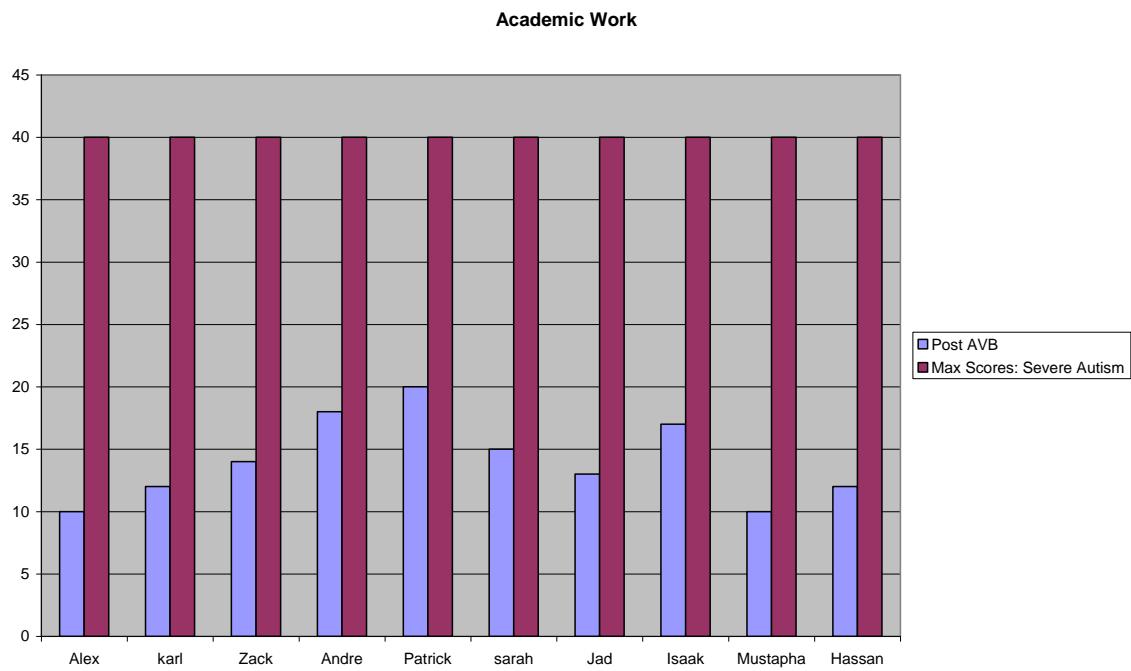
Figure (6.48) Academic Work

17. Social Repertoire

The social repertoire programme involves circle games, greeting people, social interaction, and simple conversation, getting and giving simple information, playing alongside children without disruptive behaviours. The children had made significant improvement as indicated in figure (6.49). Alex and Mustapha have improved by 18 points, Hassan has improved by 17 points; Andre and Jad have improved by 16 points; Karl, Sarah, and Isaac have improved by 15 points; Zack and Patrick have improved by 14 points.
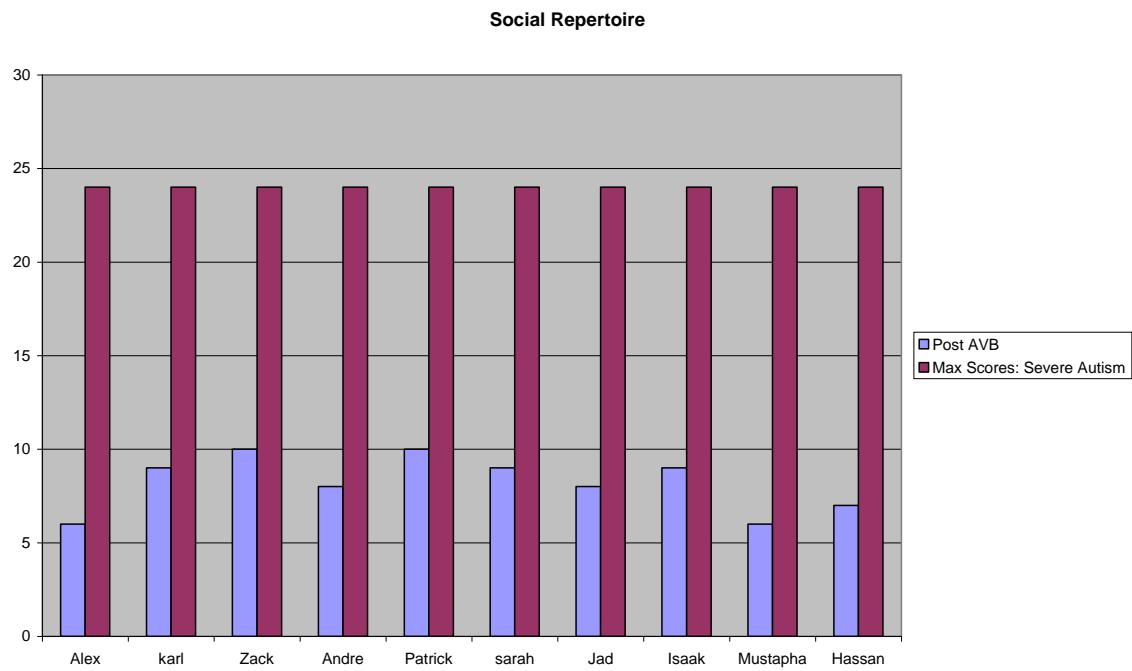
Figure (6.49) Social Repertoire

18. Self-Help Skills

The self-help skills programme involves dressing and undressing, toilet independent , using spoon, fork to eat, drinks from a cup without spilling, using napkin, swallows food before taking more food into mouth, throwing away leftover, wearing hat, hanging up coat having a hair cut without disruptive behaviours, washing and drying hands brushing teeth, tidy things away. All the children have made significant progress as indicated in figure (6.50). Sarah has improved by 60 points; Alex has improved by 59 points; Mustapha and Hassan have improved by 58 points; Jad has improved by 54 points; Karl has improved by 53 points; Andre and Isaac have improved by 49 points while Zack has improved by 48 points.
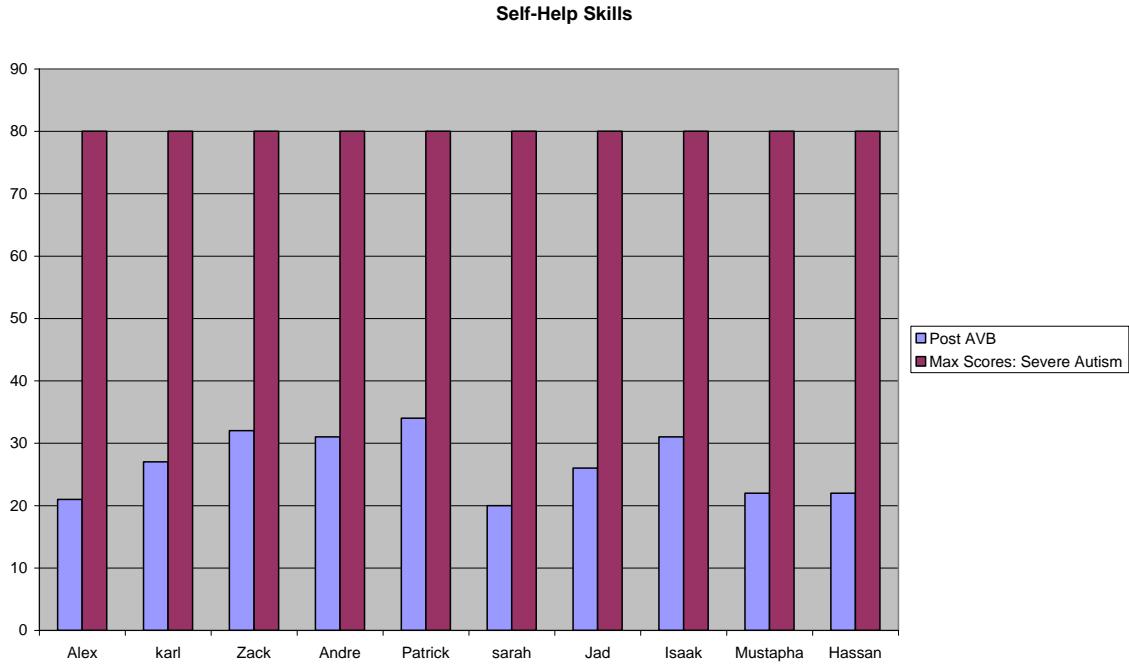
Self-Help Skills

Figure (6.50) Self- Help Skills

To summarize this section, it can be seen from the results (the pre & post AVB scores) above that the children have made significant improvement from their parents' perspectives in the following areas: behavioural, compliance, waiting performing skills in different situations, receptive language, receptive behaviours, expressive behaviours, social Intraverbals, non verbal imitations, matching and sorting, play skills, object labelling, verbal imitation, abstract concept, sentence structure, academic works, social repertoire, and self help skills.

6.3.4 Section 4 Personal Views

Figure (6.51) indicates that the children have shown progress according to their parents and also how easy to deal with their children, the parents have strongly agreed that the

children have shown noticeable progress, which may be attributed to the AVB intervention and they truly recommended it to others. Alex, Karl, Sarah, Isaac, Mustapha and Hassan have improved by 18 points; Jad has improved by 16 points; Zack has improved by 16 points while Andre has improved by 14 points. Patrick has improved by 10 points only.
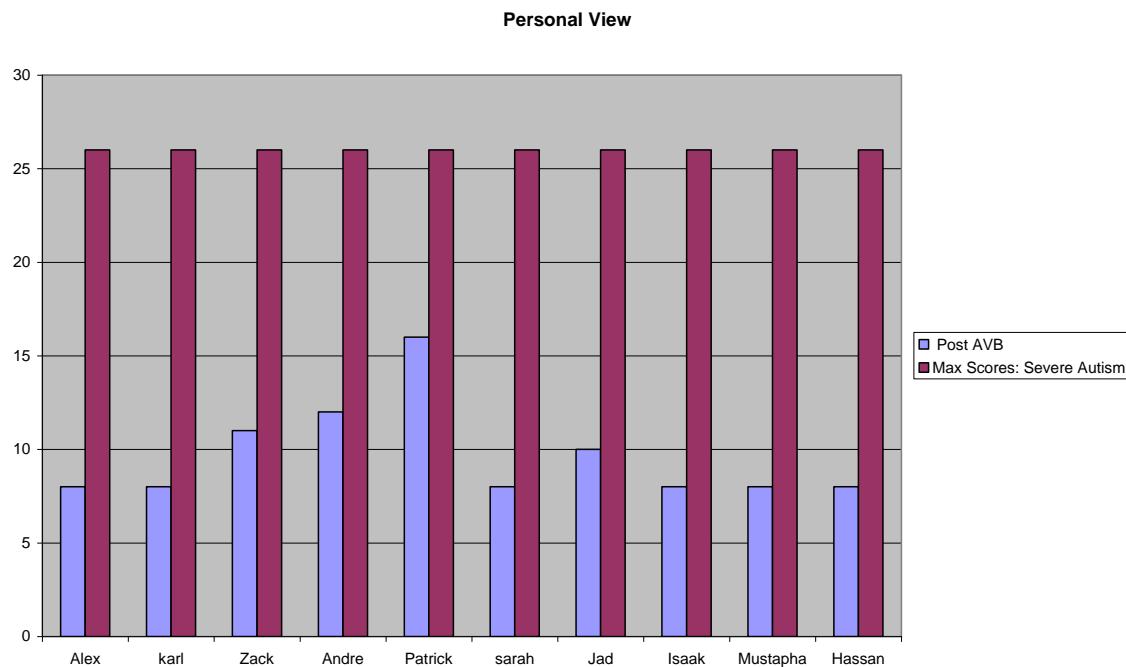
Personal View

Figure (6.51) Personal View

As for the open – ended questions the comments by the parents were very interesting and promising (refer to chapter 7 or Appendix AA).

Names of the children	Pre AVB	% Pre	Post AVB	% Post	% Rate of Improvement
Alex	373	48.12	151	19.48	28.48
Karl	679	87.61	213	27.48	60.13
Zack	589	76	234	30.19	45.81
Andre	622	80.25	253	32.64	47.61
Patrick	644	83.1	251	32.38	50.72
Sarah	594	76.64	206	26.58	50.06
Jad	624	80.51	207	26.70	53.81
Isaac	676	87.22	285	36.77	50.45
Mustapha	596	76.90	178	22.96	53.94
Hassan	638	82.32	191	24.64	57.68
Max Scores	775	100	775	100	100

Figure (6.52) Parent's Evaluation of their Children Percentage of Improvement Out of Maximum Score
Higher pre & post percentage indicates severe autism

In summary, all the children participated in this study have shown significant improvement by their parent's evaluation, from comparing their children's performance of specific skills pre& post AVB intervention which is indicated in figure (6.53).

**Total Pre & Post Score
of children Evaluation Form by their Parent**
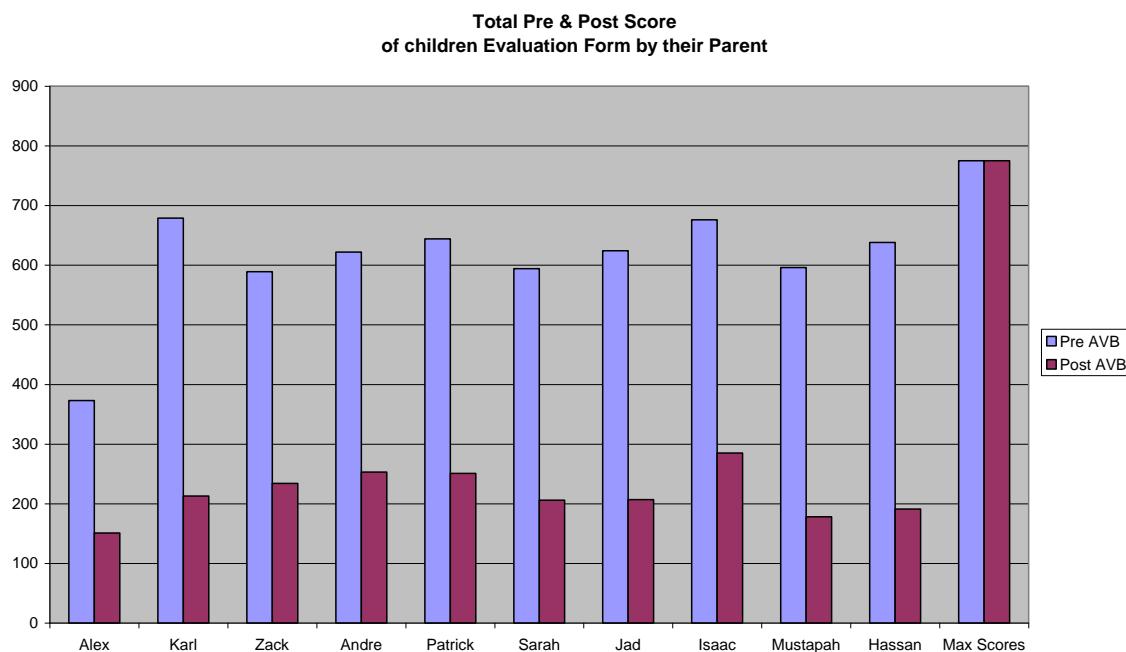
Figure (6.53) Total pre & post score of children evaluation by their parents.

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Figure (6.52) gives the rate of improvement of the children's performance of specific skills by their parents. The rate of improvement of each child varied from 28.48% to 60.13%. Although, the lowest rate of improvement was assigned to Alex, he scored 151 out of 775 which put him in category of distinguished progress. Bearing in mind that Alex has scored in the moderate autism category (pre-AVB) by an independent psychologist (using CARS) and later he has scored in the non autistic category (post AVB). The rate of improvement for the rest of children was varied from 45.81% to 60.13%. This results show that the majority of children have shown a significant improvement according to their teachers' evaluation.

6.4 Comparing the results of both Teachers and Parents' Questionnaires

The purpose of this section is to compare the findings of the questionnaires by both parties i.e. the teachers and the parents. The questionnaire was designed in order to investigate the effect of implementing an AVB programme on children with autism by their parents and their teachers.

To minimize the risk of biased reporting, both teachers' and parents' questionnaires were compared together in order to find any similarity or any differences in the measurement of the children's progress by their parents or teachers. Post AVB intervention scores of both teachers and parents were entered.

The result of the comparison was very interesting where most of the finding were almost identical. Hence, the measurements of the children's progress were justified.

6.4.1 Comparison of Personal View of the Teachers and the Parents:

As for the Personal view of the teachers and parents regarding the children's general progress and their experience in the AVB programme, if there is something they dislike about, if there were provided with adequate education, and if they recommend it to others. As indicated in figure (6.54), the teachers and the parents of Alex, Karl, Sarah, Isaac, Mustapha and Hassan all have agreed on the positive outcome of their children and their positive experience with the AVB programme. The named children were given the same scores by their parents and teachers. As for Zack, Andre, Patrick, Sarah and Jad, there were differences between the teachers' and parents' point of view regarding the children's general progress and their experience with the AVB programme.
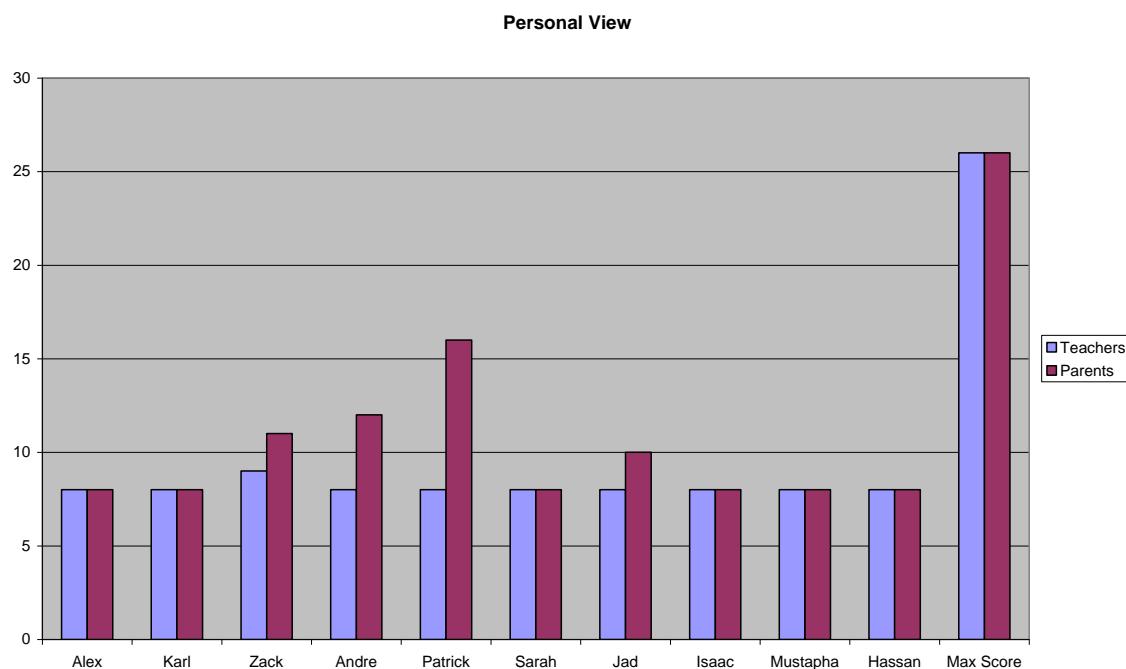
Figure (6.54) Personal View

Zack has scored 9 by his teachers and 11 by his parents, Andre has scored 8 by his teacher and 12 by his parents, and Patrick has scored 8 by his teacher and 16 by his parents while Jad has scored 8 by his teachers and 10 by his parents.

It can be seen that the differences between the scores are small and insignificant, with the exception of Patrick where there is a noticeable difference between the parents and the teachers' point of views. This difference has lead the researcher to re-examine the open-ended answers to find out that the parents of Patrick were expecting him to use speech in order to communicate his needs although he is a non verbal child. They expected the AVB Programme to allow their son to use speech in order to communicate his needs. The use of pointing, Pictures Exchange Communication System "PECS" and gestures apparently was good enough for Patrick. The researcher, the teachers and his parents were aware that Patrick is a non-verbal child who did not start to make any sounds before the implementation of an AVB programme. (More information about this issue is detailed in the open-ended questions).

The evaluation form by parents and teachers was limited by many factors:

- Teachers and parents were working cooperatively in implementing the AVB approach with their children. This relationship might have influenced the results.
- Teachers and parents coming up with the same conclusions regarding their children's performance. Parents and teachers cross-checking their evaluation forms may have influenced their ratings of their children's performance of specific skills.

6.4.2 Open-ended questions:

The participants of this study were only 10 children, in addition to their parents and teachers perspective of their progress. Therefore, the researcher has chosen to include all the open-ended answers by both teachers and parents in Appendix (AA), in order to have in depth view of their perspective of the children's progress or lack of progress. The following are the open ended questions with sample of the answers by the teachers and the parents.

Question 1. What were your goals prior to starting AVB programme for your son?

Parents and teachers were both involved in setting goals for their children especially with issues to deal with the inappropriate behaviours and better academic, communication , social and play skills. They both agreed on Individual Educational Plan "IEP" and objectives for each child.

The following are some quotations from teachers and parents regarding the children's targets and objectives of implementing an AVB programme with their children (for the rest of the answers see Appendix AA).

Alex's teachers set up targets in order to enable him to: " adapting well to social interaction; starting conversation and do some mathematic operations."

Zack's teachers were working towards: "stopping tantrums, and teaching him good behaviours and less avoidance from work, quick response". While his parents wanted the AVB programme to: "help my child to behave better and express him-self and his needs, and better social interaction".

Andre's teachers were working towards: "fewer tantrums, better eye contact, waiting, less drooling, and better attending skills". As for his parents, they wanted him to become independent: "Andre will have some self-help skills, become independent as much as possible, more sociable and well behaved and finally improving his academic skills."

Isaac's teachers wanted to: "to decrease his self-stimulatory behaviours, teaching him to use mands (requesting things spontaneously), and to do some group works etc..." Isaac's parents: "to improve his behaviours".

Question 2&3. How did your goals changed as you proceeded through the programme?

All the teachers and the parents have changed their goals as they proceeded through the AVB programme, (except for Patrick's parents who were the only one who answered No to this questions). Teachers and parents commented that after the implementation of the AVB programme the children were more willing to learn many new skills in a short period of time.

Alex's teachers considered him as a teacher assistant: "he has improved in his reading and social skills, where he became a helper and an assistant to us like a mini-therapist".

Karl's teachers stated that : "Karl was very fast and acquired a lot of academic skills; he made quick progress comparing to other children of his age". While his parents said they: "wanted more academic work since Karl showed a significant improvement and he learns very quickly now."

Zack's teachers stated: "since his behaviour has improved we introduced new goals: better interaction, and more academic skills". While his parent reported that: "he can use signs to tell about his needs, and his interests in others are now much better".

Andre's Teachers stated: "His drooling has stopped, and his behaviour has improved so much, he is more alert and his eye contact is excellent, he is responding to his name and to some simple instructions and he understands the concept of waiting". While his parents said that: "He is more present, his attention and eye contact improved, he is more sociable and his behaviour when we go out is much better".

Sarah's parents were happy with her performance and they said that: "she has become a sociable child now and by a miracle she became potty trained. By miracle we mean the AVB programme. She is a gorgeous little girl with lovely hat and hair band where I used to dream of her wearing them".

Jad's teachers were very happy with the development of his social skills and the improvement in his behaviours: "very surprised that he started making friends and

enjoying their company, he became very helpful in the class room or in the play-ground attending to the teachers and helping his peers when needed".

Isaac's teachers stated: "we were very surprised with the outcomes where he started manding and doing matching". While his parents said that for the first time ever: "we were able to take him outings where we enjoyed the Christmas day with all the family".

Mustapha's teachers have reported the fast acquisition of new skills by him: "many advanced objectives were introduced because he mastered his entire programme in a very short period of time". While his parent reported less anxiety and stress during the AVB intervention . His mother said: "I was so depressed and I felt better during the implementation of the AVB programme".

Hassan's parents were happy with their son's performance: "he is learning anything very fast he is trying so hard, GOD bless him and bless the AVB programme".

Question 4&5. Did you reach your goals, please explain?

All the teachers and the parents have encountered positive surprises for their children during the AVB intervention. They embraced the positive outcomes of their children with the exception of Andre and Patrick's parent where they acknowledged the improvement their children have made but they wanted more academic skills to be achieved by them. Andre and Patrick are both non-verbal children with behaviours difficulties and they are in need to and according to teachers and (the researcher agrees) for attending skills and

pre-academic skills to be mastered first before they can move to more advanced academic skills.

Alex's parents stated: "Alex is very happy to learn". While Karl's teachers stated: "Karl reached more than his assigned goals, he can do things where he can be easily adapted to it and can be compared with even older regular children (puzzles, matching)."

Zack's teachers stated: "he is more present and he is very cooperative now and he can easily follow instructions". His parents stated: "use more language and better communication".

Andre's teachers stated that: "he is easily redirected into works and play". While his parents said: "surely, if I want to reach my goal I will never be satisfied but for the rhythms of Andre, there is improvement but some more academics tasks needs to be worked on".

Patrick's teachers stated: "Patrick has reached all his goals and met all the IEP objectives and he even started initiating social interaction with peers and regular students in the play ground and during extracurricular activities". While his parents said: "despite some improvements, the above goals were not yet achieved."

Sarah's teachers said:" she reached all her goals and she was very happy to learn and make friends". Her parents said: we are very happy with her progress and now she relates better to us and her brother where she is taking turns and sharing toys with him".

Jad's teachers stated:" he reached all his goals and he was very happy to learn and make friends he stopped getting aggressive towards others". While his parents said: "we are very happy for him to get to this point and reaching all his goals".

Isaac's teachers stated: "he is a lot calmer and happy to work, he tolerates waiting for longer period". His parents said: "happy with the result".

Mustapha's teachers stated: "he reached all the IEP's objectives very fast then we had to introduce new advanced objectives concerning his social and academic skills". His parents said: "he can wait and follows instructions easily and he is more organized and does not tantrum anymore."

Hassan's teachers stated: "once his behaviours has improved, he was very motivated to learn and he became more sociable." His parents said: "he is easier to communicate with, he can do some academic tasks which we dreamt of him doing".

Question 7 & 8. Did you consider these surprises as positive for your son. Please explain?

All the teachers and the parents have considered the surprises as positive and significant except for Patrick's parent who were not sure about the surprise.

According to Alex's teachers, he learns new concept much easier than before and he is caring and sociable boy: "He learns by observation, or incidental learning, as he learnt a French song by just hearing us singing it. He also cares about peers and take cares of them"

Karl's parents said: "positive surprises. I have not expected Karl to learn so much and in a quick way".

Andre's teachers stated: "he is more sociable with others and peers, he is integrating really well with regular children and he has made some friends". While his parents were very surprised with his behaviours: "I can't believe that he can wait now and he understands the concept of waiting, he stopped turning the TV on and off all the time. It is magical".

As for Patrick, his teachers commented that: "Patrick started eating solid food as he was still bottle fed and using liquidized baby food only. He was able to climb up and down the stairs where his fine motors were significantly improved ". The reader is advised that Patrick's parents were not sure if the surprises were positive or not and they did not want to explain despite the various attempts by the researcher.

Sarah's teachers stated: "well behaved and better social interaction than we expected especially with regular students". While her parents commented on the positive behavioural changes: "we can now go outing, to the park to play with other children, going to restaurant and amusement park with no problem whatsoever".

Isaac's teachers stated: "he acquired very good matching skills, which helped him to communicate his needs using words or pictures spontaneously". While his parents were happy to see him working: "we can't believe that he can discriminate colours, and matching. He can work and wait for longer period where we used to think it was impossible for Isaac to achieve such goals".

Mustapha's teachers stated: "he is learning very fast following the AVB programme. He is grasping quickly any concept which is taught to him". While his parents have noticed the improvement in his social skills and said: "he can sing, count, he has friends".

Hassan's parents stated: "we did not expect him during this year to use words to communicate and to stop his tantrums, it is a gift from GOD. Now we feel he is like any other typically developing child".

Questions 9&10. Was there anything you dislike about AVB programme please explain?

Teachers' and parents' answers were in favour of the programme and they did not have anything to dislike about the AVB programme except for Patrick's parents which is

mentioned later in this section. One of Mustapha's teachers had some reservation (the rest of the teachers did not) regarding the AVB programme in respect to the collection of the daily data of the items which are still in acquisition or mastered by the children. He mentioned that he does not like to collect: "the daily data, and the student's needs of the intervention of an adult by prompting, rewarding etc..." He prefers for the child to work independently in separate place as in work station and to follow a visual schedule throughout the day.

The reader is advised that Mustapha's teacher was previously trained to carry out TEACCH method and he did not collect daily data, he used to write some notes at the end of the day. In addition, he was not sure about the errorless teaching technique as he prefers to allow the children to respond on their own time even if they are still learning the skills .Errorless teaching technique is used during the process of teaching new skills in order to keep the children motivated into learning and it is done in a fast paced mode in order to keep them focused, and the prompts is faded gradually as the children start to acquire the skill. As with the AVB programme the teacher has to make more effort, be creative and motivate the children into learning.

Karl's parent have found the AVB programme very effective even with her typically developed daughter: "of course not, it is great programme and I start to apply it also with my daughter."

Patrick's teachers believe that if his parents were more cooperative, he would have shown a better progress: "The AVB programme was very beneficial for Patrick as he was able to behave like a 3 years old child at school and become independent in his self-help skills while he was not given a chance at home and he was treated like a 5 month old baby. He would have made a better progress if the parents were more cooperative with the teachers".

Patrick's parents wanted more academic activities and for their son to have some speech although he is a non verbal child they commented: "lack of easy homework and lack of availability of speech therapy and lack of integration in regular school".

Question12&13. Would you recommend AVB programme to others and why?

All the teachers have agreed to recommend AVB programme to others because

"It is effective and the measurement of the progress is obvious and improvement does not take long to show".

The following are parents' quotations as why they recommend the AVB programme:

Karl's parents said: "because of the positive outcomes which I have never dreamt of".

Andre's parents stated: "because I am sure it will give good results."

Jad's parents stated: "if it worked for Jad it must be the best programme ever. Jad does not hit his cousins anymore and they are the best friend now where it used to be a dream of all our family to watch them play together".

Question 15. Any other comments about your experience of implementing an AVB programme for your child?

All the teachers and the parents were in favour of the AVB programme and some of them consider it as a gift from God while Patrick's parents want more one-to one teaching for their son.

The teachers of all the children have given the same statements:" it is quite effective and children are very happy to learn which is in return very rewarding to us".

Alex's parents stated : "it is a gift from GOD".

Karl's parent has commented on the positive AVB experience with her child even it was tiring for them: "it gave me a lot of pleasure to work with the group and it has been a great experience although tiring but rewarding". While Patrick's parents requested more one to one teaching instead of having one teacher for every two children: "we noticed some changes in our son's behaviour and socialization and attention." However the AVB programme in their opinion: "may need more one to one teaching".

Sarah's parents considered the AVB programmer as "it is the best programme ever".

Summary of the chapter

Analyzing the evaluation forms of the teachers and the parents, clearly indicate the improvement the children have made or shown by their teachers' and their parents' perspectives, which may be attributed to the AVB intervention programme. Some children have made significant improvements while others had shown moderate progress. In addition, the teachers and the parents both agreed on their children's progress and the improvement they have shown, and all parents recommended the AVB programme because and according to them "it is an effective programme" for their children. Next chapter will discuss the findings of the research.

Chapter 7- Discussion

The purpose of this chapter is to draw together the findings of the previous two chapters in order to measure the children's progress and performance by the researcher, the independent agency (psychologist), the parents and the teacher's. To begin with, this chapter will start with a discussion of the main findings according to the research questions. In addition, discussion will also cover the methods used to investigate the research questions in order to highlight the research findings. It will also discuss the current findings in the literature, the results undertaken by this study, and the new findings which will contribute to the advancement of the research of the AVB Programme.

7.1 Summary of the main findings according to the Research Questions

The Data collected during the field study presented very interesting results. There were primary sources of data such as The ABLLS, The BLAF, The Evaluation form by Teachers, and parents, PSI Short Form, and CARS.

These data were reflected in the results chapters of post AVB intervention (see chapter 5 & 6). A number of questions were raised regarding the results such as: What is the

outcome of the study? Has it made any difference? What is the evidence? What is the perceived evidence from these data?

In terms of evidence, the data is in favour of improvement of all the children. The improvements are not simply in terms of children but also impacting from teachers' and parental perspective. The researcher's argument of what have been taking perceptively of impact of AVB intervention is not only on children, but also on overall quality of family life, then gaining influence to either children or quality family life have to be seen positive. The influence is that parental anxieties and stress are reduced, and finally the opportunity for improved parent-child relationship is enhanced.

The research data reflects the decreased number of aggressive and self stimulatory behaviours where the children according to their teachers, parents, the researcher and the independent psychologist have noted the decrease in exhibiting these types of behaviours. The children's behaviours have improved tremendously and the progress was noticed by all the parties involved.

The literature review highlighted the importance of parental involvement in the education of their children. According to Deam (2001 p.216) who has suggested that schools which work with parent can provide "dramatic and long lasting effects". In this study, parents were actively involved in their children intervention. The noticeable decrease in the parental stress levels clearly indicates the better child - parent relationship and a more cooperative child.

The children have shown noticeable improvement in many areas especially in the basic learner skills, self-help skills and gross and Fine motor skills. As for the academic skills some children have shown significant improvement while others had moderate to minor progress.

7.2 Research Aims and Findings

This study has been set out with two aims, first to study the effects of implementing AVB programme on children with autism regarding the children's academic functioning, language functioning and adaptive functioning. Secondly to study the effects of implementing the AVB Program on the children's parent by measuring their stress level before and after the AVB intervention.

7.2.1 First Aim of the Study

This aim was investigated through four main questions:

    1. Is AVB effective in teaching children with autism in the areas of Basic Learner Skills, Academic skills, Self-help skills and Gross Motor skills?

    2. Is AVB only effective as an early intervention?

    3. Will the children be more co-operative with teacher/parents requests while receiving AVB?

    4. Is AVB an effective way to reduce mal-adaptive behaviour?

Question1.   Is AVB effective in teaching children with autism in the areas of Basic Learner Skills Academic skills, Social skills, Self-help skills and Gross Motor skills?

The BLAF, The ABLLS, CARS, the Parents/teachers evaluation forms and PSI Short Form were used in order to answer the research questions. All these tests and forms clearly indicated and showed the progress the children have made during the implementation of the AVB programme in the areas of the basic learner skills, social skills, self-help skills and Gross and fine motor skills. Many children's progress was significant while others had shown moderate improvements.

All the parties involved have reported on the positive outcomes of the children participated in this study and they attributed their progress to the AVB intervention. The reader is reminded that although the four parties have used different tests in order to report on the children's performance. All the tests examined the children in the areas of academic functioning, language functioning and adaptive functioning. The improvement shown in one test has occurred in conjunction with improvement in other tests. The reader is advised that "The ABLLS & "The BLAF" are not used in Lebanon; they were only used for this study. Professionals such as psychologists and psychiatrists in Lebanon use "CARS" and "DSM-IV" in order to diagnose and assess children with autism.

a) The Behavioural Language Assessment Form "The BLAF"

As mentioned previously The BLAF is a quick assessment which is an introductory to THE ABLLS. The BLAF examined the children's skills in 12 different areas which involves the children to: Cooperate with Adults; Make requests; Copy actions; Make

sounds/words; Imitate sounds/words; Match objects to sample; Understand simple directions; Label items and actions (nouns and verbs); Categorize by feature, function, class; Conversational skills; Know letters and numbers; and social interaction.

The BLAF pre and post AVB average scores showed that five out of ten children have shown significant progress in their performance and they reached level 4 and 5 which indicates a remarkable improvement. While the other five children have reached level 3 which indicate a moderate progress in their performance (see chapter 5).

b) The Assessment of Basic Language and Learning Skills "The ABLLS"

The ABLLS is a more comprehensive assessment of the children performance which examines the children in the areas of Basic learners Skills, Academic Skills, Self Help Skills and Motor Skills (see Appendix I).

Examining The ABLLS' results, shows that ten out of ten children have made significant progress in the Basic learners skills, self help skills, and Gross Motor skills, they have also shown progress in the cooperation programme, play and leisure, social interactions, group instructions, class room routine, generalized responding of the acquired skills, dressing, eating and grooming programme (See Chapter 5).

As for the labelling, Intraverbals programme only two children have shown progress in this area which is an advanced programme for verbal children. The reader is reminded that most of the children who participated in this study were non verbal.

Seven out of ten children have shown significant progress in their performance in the visual performance programme. While six out of ten children have shown significant progress in the receptive language, imitation, spontaneous vocalisation programme while the rest have shown minor to moderate progress.

c)Childhood Autism Rating Scales "CARS"

CARS was conducted by the independent psychologist in order to measure the degree of autism of the children in 15 areas of functioning such as social, verbal and non verbal imitation, emotion and affection, body use or motor coordination, objects use, adaptation to change, visual response, listening response, sensory response, fear and nervousness, verbal and non verbal communication, and interests and activity level, and level and consistency of intellectual response. Examining the pre and post AVB intervention scores, shows that all the children have shown considerable positive progress in their performance as it was noted and reported by the independent psychologist.

The results of the CARS which measures the degree of autism for each child have yielded very interesting results. Many children have improved significantly. For example, Alex is no longer classified as autistic while Jad, Mustapha and Hassan have scored at the margin

between the mild and non –autistic category. The rest of the children have shown noticeable progress from being severely autistic to mildly or moderately autistic.

d)Evaluation Questionnaires by teachers and parents

As for the evaluation questionnaires of the children's progress and performance from the teachers' and parents' perspectives, the children have shown considerable and significant progress in their performance in the areas of: Behaviour, Compliance, Waiting, Performing skills in different situations, Receptive Language, Receptive& Expressive Behaviour, Social Intraverbals, Non-Verbal Imitation, Matching and Sorting, Plays Skills, Objects Labelling, Verbal Imitation, Abstract Concept, Sentence Structure, Academic Works, Social Repertoire and Self-help Skills.

To minimize the risk of biased reporting, both teachers' and parents' questionnaires were compared together in order to find any similarity or any differences in the measurement of the children's progress.

The result of comparing parents' and teachers' questionnaires, was very interesting where most of the findings were almost identical. Hence, the measurements of the children's progress were justified from their teachers' and parents' perspectives.

Results of all the above mentioned tests indicate that increased communication and attending skills occurred in conjunction with decreases in the children's problematic behaviours. There is a direct positive relation between the increases of communication

skills and the decreases of problematic behaviours of the children. As a result, all parental stress level has considerably decreased.

Question 2. Is AVB only effective as an early intervention?

As far as this question is concerned, all the children have shown significant improvement despite their age. According to CARS scores, this research have shown that the age of the children did not interfere with the learning progress as Alex who was the oldest child still had the best outcomes of the children. However, he was diagnosed with moderate autism at the start of the AVB intervention. Zack was in the same age range as Alex but he scored at the border of the moderate autism category post AVB intervention. There were five children with the similar range of 3-5 years of age and they were all diagnosed with moderate to severe autism pre AVB implementation while their post AVB intervention were varied, two of them have scored in the mild autism category and the other three scored in the moderate autism category. There were three children with 6-8 years of age, they had virtually, similar pre AVB scores while the post AVB scores varied as one of them scored in non autistic to the mild autism category and the other two scored at the border of the moderate autism category.

The literature review has shown that early intervention is very beneficial for children with autism in order to teach them the skills they need at an early age. Therefore, children with younger age have more advantages than older children. This research has shown that younger children have shown significant improvement and 2 out of 5 of them have scored in the mild category of autism. However, older children participated in this study have

shown also better improvement than younger one. As in the case of Jad (6-8 of age) and Sarah (3-5 of age) they both had virtually similar pre AVB scores but Jad had better post AVB score which put him in the non-autistic to the mild category of autism. Andre (6-8 of age) and Patrick (3-5 of age) they have virtually similar post AVB results despite the fact that Andre had more severe type of autism than Patrick in the Pre AVB scores. In conclusion, children benefit at all ages, even children with the same age range and same scores of disability, they sometimes vary with their progress and performance because each child with autism is an individual.

The CARS scores post AVB intervention, which was conducted by the independent psychologist, has indicated the decrease of autism severity of all the children participated in this study. The improvement shown in CARS scores occurred in conjunction with a decrease of severity of autism of the children from their teachers' and their parents' perspectives (evaluation forms). On a scale of 1 to 8, parents and teachers were judging the degree to which each child is affected by his/her disability, where the higher the score is the more severe they are. Alex and Zack were in the same age range (9-10 years). In the evaluation form which was filled by teachers and parents, Alex post scored 2 and 3 while Zack post scored 6 and 5 from the teachers and parents perspectives. These scores put Alex in the non autistic category while Zack scored in the moderate autism category. As for the five children who are within the same range of 3-5 years, the degrees of the children disability which were judged by their teachers and their parents have decreased. Karl has scored 3 while the rest four children Patrick, Sarah, Mustapha and Hassan post scored 4 which put them in the mild to border moderate autism category. There were

three children with 6-8 years of age, according to their teachers and parents Jad had scored in the mild autism category while Andre and Isaac scored in the moderate autism category.

The degrees of the children disability (post AVB intervention) which were judged by their teachers' and their parents' perspectives occurred in conjunction with CARS findings (post AVB intervention) in exception to Sarah and Patrick who their disability were perceived as mild by their teachers and parents and moderate by the independent psychologist (CARS).

Question 3. Will the children be more co-operative with teacher or parents requests while receiving AVB?

The results were very promising, as all the teachers and the parents have agreed that dealing with their children is a lot easier than they expected once they followed the AVB techniques (For more information see open ended questions in chapter 7).

Question 4. Is AVB an effective way to reduce mal-adaptive behaviour?

This research indicated that the teachers, the parents, the independent psychologist and the researcher have all noticed and noted the significant decrease in the self-stimulatory, aggressive and self-injurious behaviours. As for the aggressive and self injurious behaviours only three children have exhibited these types of behaviours, but they have significantly improved. Karl has stopped biting his hands which was badly scarred of the constant biting before the AVB intervention. The Applied Verbal Behaviour "AVB"

programme has helped him to express his needs in order to show excitement or distress by teaching him alternative and appropriate behaviours. Zack and Jad were aggressive towards others and the AVB intervention has helped to decrease these types of behaviours and they became more cooperative and tolerant of others.

As for the self-stimulatory behaviours, all the children have shown considerable improvement in this area by exhibiting less self-stimulatory behaviours. The decrease of these types of behaviours was noted by all four parties: the researcher, the independent psychologist, the teachers and the parents.

All four parities have noticed that the children were more motivated into work, teaching them alternative behaviours using the AVB techniques, in order to improve their social skills, communication skills and play skills. AVB have had a positive impact on the children and a decrease of self-stimulatory behaviours was noticed by the four parties.

7.2.1.1 Triangulating the Data:

Triangulation is a term often used to indicate when more than two methods are used in a study with a view to double checking results. This is also called "cross examination" (Cheng, Liying, 2005, p. 72.).

Triangulation is a powerful technique that facilitates validation of data through the cross verification for more than two sources. In particular it refers to the application and

combination of several research methodologies in the study of the same phenomenon (Bogdan & Biklen, 2006).

According to O'Donoghue and Punch (2003) p. 78 , "triangulation is a method of cross-checking data from multiple sources to search for regularities in the research data"

For this study the researcher, the independent psychologist, the teachers and the parents have collected data on the participated children. The researcher will selectively use comparisons between the ratings on different measures.

Taking the Receptive Language programme as an example figure (5.15) by the researcher it indicates that Karl , Andre, Patrick, Sarah, Isaac and Hassan, all have scored at level 1 pre AVB intervention. Level 1 indicates that the children did not understand any words or follow any simple instructions. Their post- AVB intervention varied as Karl and Sarah have reached level 4, which indicates that they can follow many instructions. Andre, Patrick and Hassan have reached level 3, which indicates that they can follow few instructions. As for Isaac ,he reached level 2 which indicates that he can follow instructions that related to daily routines.

The Receptive Language programme figure (6.11 &6.37) done by teachers and parents indicates that all the children scored in the lower range pre AVB intervention (20 points). The children have shown an improvement in their post AVB intervention, as all of them

have scored 5 points apart from Karl, Patrick and Isaac they scored 6. These results by the parents and teachers are consistent with the researcher's results in figure (5.15).

Analysing figure (5.15) and (6.11 & 6.37), it was noted that there were some variations in the ratings between the researcher, the teachers and parents. As Alex in figure (5.15) in his receptive language performance using The BLAF assessment according to the researcher, he was at level 4 pre - AVB intervention and reached level 5 post AVB intervention. While according to the assessment done by his parents teachers shown in figure (6.11 &6.37), Alex scored 20 points pre-AVB intervention (max scores which indicates low performance) and scored 5 points post AVB intervention which indicates high performance in his receptive language skills. Analysing the rating of children's performance of specific skills by the researcher, the independent psychologist, parents and teachers , they all agree on the children achieving better performance post AVB. However, there is difference in the rating in their Pre-AVB scores, as teachers and parents have rated their children (pre-AVB intervention) in the low performance range by giving them higher scores (in The Evaluation Form lower scores indicates improvement in the children's performance). Teachers and parents bias may have influenced the results as they both cross-checked their rating of their children.

7.2.2 The Second Aim of the Study

The second aim of the study was to study the effects of implementing the AVB on the children's parent by measuring their stress level before and after the intervention.

To answer the second aim of this research, the Parenting Stress Index "PSI" Short Form was used to measure the parental stress level where all the parents stress level was significantly decreased and reported a better child parent relationship as they considered their children to become more co-operative and less destructive.

7.2.2.1 Parenting Stress Index Short Form "PSI"

PSI Short Form was used for this study in order to measure the parental stress level. Examining the pre and post scores of the AVB intervention, children have shown progress and improvement from the perspective of the researcher, independent psychologists, teachers and parents.

Parenting a child with autism is stressful (Konstantareas, Homatidis et al., 1992; Silberg, 2002, Mary & Baker, 2005). As children with autism have deficiency in communicating their needs in the appropriate way, parents are found puzzled of how to communicate with their autistic children which add to their stress level. Using the AVB programme to teach both children and their parents an appropriate way to mand or request things in a way which is meaningful and motivating to a child which as a result have a significant influence on decreasing the parental stress level and having a better parent child relationship. Mustapha's parents stated: "I feel now that dealing with my son is a lot easier than before thanks to the AVB programme". (For more parents' quotation, see chapter 7: open ended questions).

Analyzing the PSI Short Form, all the participated parents have felt that they can handle things very well after the implementation of AVB. They consider themselves very good parent, having a better parent-child relationship instead of commenting on having a difficult child to deal with pre AVB. All the parents have agreed on this statement (post AVB): "I have found that getting my child to do something or stop doing something is somewhat easier than expected" that is in exception to Patrick's mum who still consider that getting her son to do something or stop him from doing something is much harder than she expected, despite the fact that the number of things which her child used to bother her with, had decreased remarkably.

7.3 Emerging Themes

"The Autistic Centre" has adopted the idea of using the Applied Verbal Behaviour Programme as the only stated educational strategies of provision. The Board of Trustees at "The Autistic Centre" encouraged its use and was happy to have the researcher work with the teachers and parents. Training for both teachers and parents was provided by the researcher in order to encourage generalization of the skills learned by the children. (See Chapter 3 and Chapter 4).

A discussion will look at the themes that influence the concept of AVB programme as an appropriate educational provision for children with autism by examining the research's data. This data was generated through class observations, tests and assessments, discussion with staff and children's records. The researcher examined the generated data and read and re-read each response by the respondents (parents and teachers). During this

process of reading, the themes started to emerge (Kvale, 1996). These emerging themes are as follows:

1. Structured and Natural Format of Teaching

Children with autism frequently learn task presented in a structured format more easily than tasks presented in a more abstract format (Schopler, et al., 1995). In this study, teaching children in Discrete Trial Training "DTT" and Natural Environmental Training "NET" Format has helped them to acquire and generalize the skills more easily. In the AVB programme NET and DTT can be both effective for teaching children with autism. NET is based on mand training following the child's motivation and delivering specific reinforcement. The use of DTT in the AVB programme is not applied in the traditional DTT format. In the AVB Programme "DTT" are "Discrete Mand Training Trials" following the child's EOs (motivation) and the teacher should pair themselves with reinforcing activities (see chapter 4).

2. Collateral Improvements

Another finding is that children's social communicative behaviours such as joint attention, initiating interaction, spontaneous request, have increased during AVB intervention.

3. Joint Attention and Communication

Mundy et al (1990) suggested that there is a direct positive relation between joint-

attention and communication in children with autism. Improvement in one area in this study may have stimulated an increase in the other. However the result of this present study is consistent with prior research on the relation between communication and social behaviours (Mundy et al., 1990). Result also indicates that increased communication skills occurred in conjunction with decreases in problem behaviours.

The result of this study indicates that AVB intervention is an effective way to reduce the mal-adaptive behaviour of children with autism. All parties have noticed that the children's behaviour have improved significantly, as a result of the AVB intervention.

4. Quick Skills Acquisition:

AVB has led to significant and positive changes amongst all the children with autism, including gains in social, gross and fine motor skills, self-help skills as well as some academic skills.

To explain the relatively quick skill acquisition for the children participated in this study, several factors were included in the AVB training procedures as follows:

- **Acquiring Basic learner's skills**

  The basic learner skills section of The ABLLS provides a curriculum that emphasise skills that are important for being able to "learn to learn". Therefore, the majority of instructional time has been devoted to the development of these

critical skills in order to learn from everyday experience (Partington & Sundberg, 1998).

The children had acquired essential attending skills which as a result, they have shown an improvement in their social skills such as improved eye contact, less temper tantrums, improved play skills, pre academic skills, following classroom routines, and mastering skills in a very short time etc...

- **Academic skills**

  The Academic Skills Section should not be of a higher priority than those in the Basic Learner Skills Section. Unless the child has made considerable progress in most of the areas of the Basic Learner Skills Section, or unless the child already has easily learned some or has an interest in numbers, letters, etc... These types of skills should be deferred to a later time.

- **Self-help skills:**

  Self Help Skills are a part of everyday activities and are important skills to acquire. Therefore, the child's skills can be carefully shaped in the process of his participation in those activities. Many of the skills identified in the Basic Learner Skills Section can be developed in conjunction with the teaching of the self-help skills. The children have shown a remarkable improvement in this area.

- **Gross and fine Motor skills:**

As with self-help skills, there are many opportunities to incorporate the development of motor skills into many of the daily activities. The development of both fine and gross motor skills can also result in opportunities to reinforce the learner's cooperation, development imitation, and receptive language skills and following class-room routines etc… the development of these skills can also facilitate the development of social interaction skills (basic learner skills) by helping the child to learn to engage in motor activities that involve peers.

Examining the generated data, all the participated children have shown remarkable progress in this area as noted by all parties involved in this study such as the researcher, the independent psychologist, the teacher and the parents.

5. Staff and Parents Training

Staff and parents training is seen as a high priority by the Board of Trustees at The Autistic Centre, the staff and parents have received intensive training in the use of AVB with their autistic children. Training for both teachers and parents has helped the children to maintain and generalize new skills in a shorter period of time. Working on specific skills at school and maintaining those skills at home will help to improve the quality of life of all the family as Andre's parents stated: "He is more present, his attention and eye contact improved, he is more sociable and his behaviour when we go out is much better".

Mustapha's parents stated: "I was so depressed and I felt better during the implementation of the AVB program".

Parents were very happy with the training they have received as Isaac's parents stated: "we can't believe that he can discriminate colours and to do matching. He can work and wait for longer period where we used to think it was impossible for Isaac to achieve such goals".

It takes time for the member of staff to get to know a child with autism as well as time necessary for the child to feel happy and comfortable with staff. In order to ensure a safe and motivating environment for children with autism "The Board of Trustees at the Autistic Centre" had decided to apply a two year contract for any eligible staff, as the fear of staff leaving after a short time, despite the intensive training they had received by the school.

In addition to training opportunities, another issue is the opportunities for staff development in their career. To ensure the proper implementation of an AVB programme in Lebanon "The Autistic Centre" was willing to get support from a leading university in the UK in order to provide postgraduate degrees for educators and staff who work with children with autism. The delay in establishing such project was due to the unsettled situation in Lebanon.

6. Class –room Staffing

Staffing is the key element to the implementation of an AVB approach, staffing is seen as a crucial element to implement and deliver the appropriate educational provision to children with autism in any educational settings.

Staffing level was appropriate for this study as there were 3 teachers for every 5 children in each class. Classrooms were fully staffed at all times except on three separate occasions where two members of staff were off sick.

The teachers, the parents and The Autistic Centre have all shared the same vision of the school that is "teaching children with autism for a better future". This made it possible for the AVB approach to become effective and consistent with the mission statement of the school, with all others who are working in the classrooms. They all put into practice the school's stated view of appropriate educational provision.

The Board of Trustees at The Autistic Centre had asked the researcher to evaluate the staff performance and their work with the children, in order to ensure the proper implementation of the AVB approach (see Appendix: educational survey).

7. Parental Teamwork

The literature review highlighted the importance of parental involvement in the education of their children. Schools that work with parents provide "long and lasting effects" (Dean, 2001, p.216). In this study parents were strongly encouraged to participate into

their children AVB programme, parents were happy with the input they had for their children with autism and they were actively involved with their programme and consequently, parents developed a close relationship with their children's teachers. This was demonstrated in the positive responses the parents have provided in the questionnaire. An example of this team work is given by Karl's parents: "it gave me a lot of pleasure to work with the group and it has been a great experience although tiring but rewarding".

8. Inclusion

Inclusive education for children with autism is not generally well accepted in Lebanon. Inclusion might be a problematic policy for other schools. Included children with autism are kept separated from regular students and isolated in a unit which is attached to a mainstream school. The use of AVB intervention for this study has helped the children to have social and academic inclusion with regular students. Using the AVB programme to teach the children the basic learner's skills such as the attending skills, cooperation with others, better social skills, initiating interaction, following instructions, group work and following class routines have helped them to successfully be integrated with regular students and allow them to start making friends.

9. Motivation into Learning

Children were happy to learn and acquire new skills in a short period of time. Alex's teachers were very happy with his progress: "He learns by observation or incidental

learning as he learnt a French song by just hearing us singing it. He also cares about peers and takes care of them".

As for Sarah's parents they have commented on how they can finally do things as a family: "we can now go outing, to the park to play with other children, going to restaurant and amusement park with no problem whatsoever".

10. Relationship with parents

AVB techniques has allowed the parent to have a tool to communicate better with their children even with typically developed one, as Karl's mum stated in response to the question if there was anything she dislike about AVB program: "of course not, it is great program and I start to apply it also with my daughter." She also recommends the AVB programme to everybody because of the positive outcomes with her son who she "never dreamt of".

11. Reductions in the diagnostic symptoms of autism

AVB intervention has lead to reductions in the diagnostic symptoms of autism and in the problem behaviours of the participated children. According to the independent psychologist, many children have improved significantly, as 1 out of 10 children have scored in the non-autistic categories (post-AVB). 3 out 10 scored on the margin of non-autistic to mild autism. The remaining 6 children have scored in the moderate autistic categories (post-AVB).

12. AVB is also effective in older children

Older children participated in this study have shown better improvement than the younger one.

7.4 Research Implications

The literature review showed the importance of an early intervention in teaching children with autism. However, finding an appropriate intervention for them is still debated among parents and professionals. In addition, autism is a spectrum disorder which affects the children in different degrees (Wing and Wing, 1971).

Previous research has highlighted the importance of an ABA using the Lovaas model programme in teaching children with autism. No wider research on the AVB model has been conducted. This has led the researcher to investigate this issue further. That is because the researcher is an experienced ABA/AVB therapist and a mother of an autistic child.

In Lebanon educational provision for children with autism is limited and only few places are offered to them. What are the key factors that this research has identified which impacted a child with autism, The Autistic Centre, the parents? Identified research implications are as follows:

1. Ability to Deliver Education

This research has shown that "The Autistic Centre" is able to deliver the AVB approach effectively. The staff, the parents and the children were happy during the implementation of the AVB programme. Children have shown an increase in acquisition of learning skills and decrease of problematic behaviours. All the children were happy and motivated to "learn to learn".

2. Regular School Placement

In 2006 , two children at The Autistic Centre were offered a placement at regular school; Jad and Mustapha were offered a full time placement at a leading mainstream school in Lebanon, despite the fact that they were refused the entry to this particular school a year prior to the AVB intervention. In 2007, Sarah and Hassan were offered a place at a regular school setting in the nursery and they were successfully upgraded to the next class. Patrick was offered a conditional nursery place at a "leading regular private school". The conditional offer consists of having a shadow teacher with him all the time (shadow teacher must be only provided by the school).The shadow did not use any AVB techniques to gradually integrating Patrick in the nursery setting in order to teach him the skills he needed. Patrick spent one year at this school until he was expelled from it, he then came back to The Autistic Centre with total regression of previous acquired skills, and he was even exhibiting severe behaviours problems with severe temper tantrums and aggressions towards himself and others. The reader is reminded that Patrick did not exhibit any aggressive behaviour pre & post AVB intervention.

As the children had acquired the essential basic learner's skills, communication, self-help skills and gross motor skills, they were granted to secure a place and maintain their places at the school. Mustapha was accepted in the nursery class while Jad was accepted in reception. The reader is advised that both children have successfully finished their first year at the leading school and they were successfully upgraded to the next class. Sarah and Hassan were placed in regular nursery setting and now they have both been successfully upgraded to the reception class. Jad, Mustapha, Sarah and Hassan were gradually integrated in a mainstream setting following the AVB techniques to learn in a natural setting and generalise the skills they learned. The use of motivation, reinforcement and prompts techniques have helped the children to learn from everyday experience. While for Patrick, placing him in a natural setting without the AVB procedures, had some negative effects which were manifested as a regression in his behaviours, social and communication skills.

3. Securing a Placement

High demands for places at The Autistic Centre made it difficult for new parents to secure a placement for their son/daughter with autism especially as current parents were talking about their experience with the AVB programme and how effective it is with their child with autism. In addition, there is an economic impact to effectively meeting the child's needs as many specialist places in Lebanon are extremely expensive and beyond many people's reach. The fees at The Autistic Centre were reasonably fair ($4000 per academic year comparing it to $8000 to $15000 in other private centres).

The reputation of the AVB programme has impacted other centres who they contacted the researcher in order to conduct workshops and provide training for their educators and staff. This had placed a huge pressure on the researcher in order to meet high demands for this kind of services.

4. Decrease in parental stress level

The behaviours of the participated children in this study have improved significantly which as a result, the children have shown an improvement in their social skills and communication skills. The improvement in the children has impacted their parents stress level. Parents of the participated children have reported a decrease in their stress levels and announced better child-parents relationship with their children. (More information in PSI Short form section 7.2.2).

5. Parental High Expectation

A closer look at the qualitative response of parents and teachers to the evaluation questionnaires reveals more than satisfactory outcomes of children progress. All the parents have described their experience with the AVB programme as a positive experience and all of them recommended it to others because they consider it "as a gift from GOD". However, couples of parents (Peter and Andre) were a bit carried away and seeing their children progress they started having high expectation of the AVB programme and of their children, they were expecting miracles. For instance, Patrick's parents were expecting him to use speech to communicate although he is a non-verbal

child. They even had their own hidden goal for Patrick " my goals for my son is to get my child to be more sociable, start and improve expressive talking and integrate in regular school". The part of improving expressive language did not match with Patrick's IEP which was designed by the researcher, the teachers and the parents. On the other hand, Patrick's teachers stated that the objectives of his IEP were to get him to have: "fewer tantrums, better imitation, better attending skills, waiting, social interaction, simple matching skills and follow simple directions."

The reader is advised that Patrick has met all his IEP objectives and he even started making speech sounds as indicated in the post AVB intervention (see chapter 5 and chapter 6).

As for Andre's parents, they were happy with the progress but they had high expectation of the AVB programme and of their son's performance. The reader is advised that Andre did not show any progress during his attendance at his previous school for the last 2 academic years prior to the AVB programme. Andre's parents expected him to do more academic work despite the fact that he was severely autistic non- verbal child and she was expecting him to read and write, although he had very poor fine and gross motor skills and virtually no attending skills.

Andre's parent stated: "surely, if I want to reach my goal I will never be satisfied but for the rhythms of Andre there is improvement but some more academics tasks needs to be worked on". Despite their expectation they were happy with the AVB programme, they

added: "I can't believe that he can wait now and he understands the concept of waiting, he stopped turning the TV on and off all the time. It is magical". They also stated: "My experience this year was good, Andre is much better than the previous years when he did not have the AVB programme."

6. National Level

This research is the first of its kind in Lebanon. Provision for children with autism in Lebanon is quite limited and parents are unsure of where to place their child. As the majority of the centres in Lebanon provide limited educational provision (for high functioning autistic individual only) while the more severe type of autistic children are treated as mentally retarded and are considered as non-educated and most of them are institutionalised.

This research has demonstrated the effect of applying an AVB programme on children with autism in reducing problematic behaviours and an increase in social and communication skills of all the children involved in this study despite their symptoms of autism (moderate to severe autism).

The use of the AVB Programme had a positive impact on The Ministry of Social Affairs who has drawn a contract with The Autistic Centre in order to pay part of the tuition fees for autistic children who are coming from a poor family background. In Lebanon, educational provision for children with autism varies across the country, therefore, workshops and training for professionals in remote areas were conducted free of charge

by the researcher and her team of teachers from The Autistic Centre, in order to spread awareness about autism and give the children with autism and their parents a tool to communicate their needs in a motivating, safe, fun and meaningful way for a child with autism.

Summary

This chapter has discussed the children's progress and performance by the researcher, independent psychologist, the children's parents, and teachers. The positive outcomes of children progress and performance were reported by all the parties involved in this research study. The effects of implementing an AVB programme on children with autism also have a positive impact on their parents which as a result decreased their stress level.

Chapter 8- Conclusion

This chapter will start with a discussion of the research framework, followed by the research questions. It will discuss the methods used to investigate the research questions and highlight the research findings. It will also discuss the current findings in the literature, the results undertaken by this study, and the new findings which will contribute to the advancement of the research of the AVB Programme. Finally, this chapter will conclude with research limitations and suggestions and recommendations for further research.

What were the outcomes of the study? Original contribution to work is largely in the areas of AVB practice but contribution also in terms of how we took theoretical assumption underpinning the AVB Programme (See Chapter 4).

The outcomes of this study were very interesting, since children's progress and performance in the areas of academic functioning, language functioning and adaptive functioning was reported by all the parties involved; the researcher, the independent psychologist, the parents, and the teachers. In addition, the AVB intervention had a positive impact on the children's parents by significant decrease of their stress level.

Part of what went on in this study based on the belief that parents were able to see improvement of children by their own- selves and that several behavioural problems could be reduced which open the door to improve quality of life of the whole family.

Some would wonder as why one would undergo such a research while there is already a research about ABA (Lovaas Approach). The reader is reminded that the AVB approach is similar to the Lovaas approach regarding the intensity of implementation of the programme. In addition they are both based on the principles of ABA. However, there are differences in application between the two approaches such as the type of prompting (no-no prompts versus errorless teaching); the ratio of table time to teaching done in the natural environment (NET). In Lovaas model students generally work through an extinction burst during the onset of instruction while in AVB approach students are eased into instruction, because the teachers pair themselves with reinforcements. As for the presentation of skills or items, Lovaas' model uses mass trialing technique on one (new) target repeated for ten times before moving to another mastered items within the same programme. For example, in receptive body parts programme the teacher asks the student to touch head (new items) for 10 trials then later the teacher asks him/her to touch mouth, touch tummy etc… while AVB approach uses mixing of a number of different skills or items all at once for example, asking the students to touch head then tap table, clapping hands and doing some verbal imitation etc…).

In addition AVB Approach uses errorless teaching, fast paced instructions, mixing and varying tasks, in order to reduce response difficulty and to teach the child to respond

quickly and correctly, which requires fluency not just to produce correct response (see chapter 4). The most important issue in using Applied Verbal Behaviour "AVB" model to teach the child to ask for things s/he wants (Manding), that is because the child is motivated to communicate for these things i.e. the child has an establishing operant. The child learns" I talk "or "I sign" then, "I get" which gives the child a great deal of power.

8.1 Research Frame-Work

The purpose of this research is to study the effects of implementing the AVB programme in The Autistic Centre which is attached to a mainstream school. This research has examined the effects of implementing the AVB Programme on the children's academic functioning, language functioning and adaptive functioning.

The research began with an intervention study (See Chapter 4), which examined the effects of implementing an AVB programme with children with autism. After the research criteria had been identified, The Autistic Centre was chosen because it met all the research criteria, in order to implement the AVB Programme. This was followed by obtaining an ethical consent from The Ethical Committee at Brunel University where numbers of ethical issues were identified for considerations. The researcher has taken all the measures to minimize the possible ethical risks (See Methodology Chapter). There were two classrooms in The Autistic Centre, 5 children in each class. All 10 children have the diagnosis of autism and they became the sample for this study.

After designing a training course, teachers and parents underwent intensive training in implementing the AVB Programme with their children. Training courses and workshops were conducted by the researcher and taught at The Autistic Centre (See Chapter 3). The implementation of the AVB programme is a comprehensive one as has been discussed in chapter 4.

All the children were assessed pre and post AVB Intervention using the following tests and assessments:

- The ABLLS
- The BLAF
- CARS
- Evaluation Forms by teachers and parents.

The main issue behind using different type of test is to minimize the issue of bias and subjectivity in reporting the children's progress and performance.

The literature review has shown that there is disagreement between professionals about the best way to educate children with autism (Lotter, 1974; Howlin, 1997; Jordan, Jones et al., 1998). Most of the members of The Board of Trustees of The Autistic Centre have heard about the ABA programme the Lovaas approach and only the researcher who is a member of the board is an experienced AVB therapist. All the members of the Board of Trustees were happy with the methodology of the AVB programme particularly with the

errorless teaching methods which kept the children motivated into learning. The Autistic Centre already had expressed their concerns regarding the "traditional ABA" or the Lovaas approach which in their opinions was very structured and used Discrete Trials Training "DTT" without the Natural Environment Training "NET ".

The previous research on ABA (Lovaas Approach) was conducted as an experimental research. Using the experimental research method in order to study the effects of the AVB programme on the children's academic, language and adaptive functioning was not possible first, because of the small number of children participated in the study, and secondly it was quite difficult to find a comparison group to match the control one. Therefore, a single group intervention multiple baseline study was more appropriate to use than a pure experimental research. That is because the multiple baseline design study has led the researcher to study in depth the effects of an AVB Programme on each child participated in this study. The multiple baseline design was used for this study across, behaviours, participant and settings. The children baseline assessment was taken before the AVB intervention. Teaching the children specific skills was done at The Autistic Centre and once a skill/goal is mastered with one teacher, it is then introduced with another teacher and is generalized with peers. Later on, the skill is generalized at home setting with the help of the children's parents (children were taught the skills using "The ABLLS)". The reader is reminded that the data was collected on a daily basis using "the probe daily data sheet" for each introduced skill/goal (see Appendix O). Each skill is done in acquisition, maintenance and generalization form (see Appendix N, W).

There is lack of research of the specific methodology at schools (Jordan, Jones et al., 1998). This lack of research may contribute to some confusion for the parents and professionals to determine the quality of each method. Children with autism are often having some learning disabilities (Prior, 1979), which makes it difficult for them to take national exams, which in returns affects the parent's decision for getting the best provision for their children because they can only rely on the school to evaluate the teaching quality of the children's programme.

The present study allowed the parents to be part of designing their children Individual Education Plan "IEP". Parents have received training by the researcher in the use of the AVB techniques in order to deal with their children's behaviours, communication and adaptive functioning. Children's progress and performance were reported by the researcher, the independent psychologist and the teachers. In addition, the parents were able to evaluate the teaching quality of their children's programme from their own perspective.

The rate of improvement of the children is indicated in figure (8.1). The Parental Stress Index "PSI" Short Form shows that parental stress levels (mothers) had decreased, the rate of improvement of PSI Short Form varies between 19 to 30%. Only three fathers have participated in completing the PSI Short Form and the rate of improvement in their stress level varies from 12 to 33%.

Rate of Improvement of Children

Names of the children	PSI Mother %	PSI Father %	The BLAF %	The ABLLS %	CARS %	Evaluation By Parents %	Evaluation By Teachers %
Alex	29.40	29.4	25	29.6	20.83	28.48	32.64
Karl	21.67	12.77	41.67	25.77	30.84	60.13	60.39
Zack	19.45	N/A	41.67	26.33	27.5	45.81	54.45
Andre	20.56	N/A	16.67	9.722	29.17	47.61	55.48
Patrick	22.22	N/A	21.66	9.77	26.66	50.72	54.06
Sarah	28.88	N/A	31.66	18.52	30	50.06	55.1
Jad	N/A	33	28.33	24.11	38.34	53.81	56.52
Isaac	21.11	N/A	18.33	11.95	25.83	50.45	50.22
Mustapha	24.45	N/A	45	32.81	32.5	53.94	53.57
Hassan	30	N/A	36.67	24.75	32.5	57.68	57.59
Max Scores	100	100	100	100	100	100	100

Figure (8.1) Rate of Improvement of the children

The tests and forms used for this research (figure 8.1) clearly indicate the progress the children have made during the implementation of an AVB programme in the areas of academic functioning, language functioning and adaptive functioning. Many children's progress was significant while others had shown moderate improvements. The BLAF results vary from 18 to 45%, while the rate of improvement of The ABLLS between the participated children varies from 9 to 29%. The CARS' rate of improvement varies also from 20 to 38%. As for the evaluation form of the participated children by their parents it varies between 28 to 60%. While their teachers evaluation varies between 32 to 60%. The reader is advised that the less percentage rate of improvement is assigned to Alex who had scored in the non-autistic category (post AVB intervention) and he was the only child who had good attending skills (pre-AVB intervention). Alex had reached the ceiling of most of the skills and targets which was set out for him. (Further information in chapter 5 and 6). Children's progress were noted and reported by the researcher, the independent

psychologist, parents and teachers. The positive outcomes of the children have also positively impacted their parents by reducing their stress levels (for more information, see chapter 8). Triangulating the rate of improvement of the children's performance by all the four parties, (post-AVB), indicates that all the children have shown improvement in their performances. However, the teachers' and parents' rating of their children pre-AVB were not similar to the researcher and the independent psychologist as they rated their children in the low performance range (pre-AVB).

8.2 Research Recommendations

This research has highlighted the importance of using the AVB Programme in teaching children with autism from the points of view of the teachers, parents, the independent psychologist and the researcher. The question here is what are the recommendations which can be made to enhance the proper implementation of an AVB programme? These recommendations are as follows:

1. **Motivation**: To teach Basic learner Skills, Academic skills, Social skills, Self-help sills and Gross Motor skills, the child with autism needs to be motivated into learning in order to have a value to be taught new skills. The primary reinforcers by the child are used as rewards and are positively paired with social praises in order to fade the primary reinforcers and then the child will be happy to be rewarded with only social praises.

2. **Early Intervention:** This research has shown that children are capable to learn despite their ages' differences. As individuals with autism can vary with their

capabilities and abilities therefore, they need an individual plan for each one of them which addresses their needs and teach them new skills in a way that is meaningful for them. The autistic children have potentials to learn and the teachers need to find a way (positive pairing techniques) to teach them the necessary skills in order to reach their full potential. By using the positive pairing technique i.e. the teacher should "pair-herself with the child's reinforcers". This could be accomplished by the teacher carefully observing the child and interacting with him/her in a way s/he finds it enjoyable and later on, the teacher should approach the child when s/he appears bored and unconditionally offers him/her something s/he enjoys. Later on, the teacher should place demand and provide immediate prompts when needed in order to reward correct response (see chapter 4).

3. **Teachers and Parents Joint Approach:** A child with autism needs everybody in his/her environment to be involved and contribute to the teaching process. The parents are the first primary teachers of their children and they should have an access to the approach which the teachers are using with their children. The parents in this research were trained in order to help their children to reach their full potential. The teachers and the parents worked together to help the children with autism. Teachers and parent's joint approach should be generalized at schools where teachers can teach the children the basic skills they need and the parents will help to generalize those skills in the natural setting.

4. **Less Parental Stress:** Having a child with autism is stressful (Gerrity, 1982). The stress level of many parents as pre AVB programme was significantly high. Using

the PSI Short Form to measure the parental stress level revealed the significant decrease of their stress level after the implementation of an AVB programme. Parents were more relaxed with dealing with their children after the children have gained very essential attending skills. Parents should be given a proper training on how to deal with their children with autism in order to establish better child-parent relationship.

5. **Decrease in the mal-adaptive behaviour:** All the people involved in the child environment have noticed the decrease in the mal-adaptive behaviours the children used to exhibit, such as self-stimulatory, aggressive and self-injurious behaviours. It is very crucial for everybody involved in the child's life to use the AVB techniques in order to reduce these types of mal-adaptive behaviours and to teach/reinforce and maintain the appropriate behaviours.

6. **Integration:** The skills the children acquired should be immediately generalized in the natural setting. For example generalizing waiting in a queue at the restaurant or super market after learning to wait at school or at home, and generalizing the play skills learnt at school or at home in the Public Park and play centres.

7. **Generalisation in the regular school:** The implementation of an AVB programme should be generalized in the regular school with attached unit for children with autism in order to replicate research findings.

8. **Consistency:** everybody should be consistent in dealing with children's with autism. The children and according to their parents were a lot happier and better

behaved once they started the AVB programme and they were consistent with the approach and with the teaching methods.

8.3 Research Limitations

This research has studied the effects of the AVB Programme on children with autism in the areas of academic, language and adaptive functioning by the teachers, the parents, the independent psychologist and the researcher.

This research was limited by several factors. First, the sample size of the study was limited in the first year of the research to 3 children only (Alex, Karl and Zack) and to 10 children in the second year i.e. this sample is limited in number. The researcher acknowledge this limitation and tried to minimize the risk of the small sample size by having an in-depth intervention study with the contribution of the evaluation of the teachers, parents and the independent agency alongside the researcher's assessments.

Secondly, the duration of the research should have been more beneficial if it was carried out for more than two years, in order to allow further in depth analysis of the children's outcomes.

Thirdly, the results of this study may not be generalized. However, the researcher has taken into account that this research could be generalized if the proper training for the staff, the parents and the children are provided with the same intensity which would then yield similar results.

Fourthly, the issue of bias and subjectivity is often arises from conducting research as in a single subject intervention study. In order to limit the issue of bias in this study, the advice by Hamersley (1992) was followed which is using additional type of research data. This was represented by the data collection by the researcher and the teachers on a daily basis. In addition, the parents and the teachers had the chance to evaluate the children's performance and progress. The reader is reminded that the researcher, has used quantitative and some qualitative research and video taping of the children of all the assessment which were conducted. The independent psychologist also has assessed the children who were the subject of this study pre and post AVB implementation. The reader is reminded that the parents of Patrick and Isaac have shown a video of their children participating in social activities to the independent psychologist; this issue might have influenced children "CARS" assessment.

More possible limitations for this study were the lack of data regarding the performance of the non- verbal children. The use of non verbal assessment tools should have been applied such as The Vineland Adaptive Behaviour Scales (VABS) which are designed to assess handicapped and non-handicapped persons from birth to adulthood in their personal and social functioning. Following Edgar Doll's original conceptualization of adaptive behaviour as multidimensional in structure and his measurement of the behaviours by areas, the VABS is organized around four Behaviour Domains: Communication, Daily Living Skills, Socialization, and Motor Skills (Sparrow &

Domenic, et, al. 2005). The outcomes of non verbal children using the VABS would have yielded different results than the tests used for this study.

Another limitation for this study was the lack of fathers' participation in completing the Parental Stress Index (PSI Short Form). Parental involvement in this study was mainly accredited to the children's mothers. Only three fathers have been actively involved in their children's AVB programme.

Finally the researcher is the mother of a child with autism, where her interpretation of the analysis of the data would have been seen as biased. However, the different methods and the evaluation by the teachers, the parents and the independent agency in addition, to the discussion of the findings with the supervisor and colleagues have minimized this risk of bias.

Limitations of this study include the small sample size and replication with additional subject is needed. Future studies might access the generalization of treatments, effects across home school or clinic setting.

The present study demonstrated the efficiency of the AVB programme with ten children with autism. The emergence of speech, collateral gains in social communicative behaviours and decrease of problems behaviours and the decrease of parental level stress.

8.4 Contribution to the research

Research on the ABA programme (Lovaas Approach) has been widely conducted. However, no wider researcher on the AVB programme has been applied yet. This current research was the first to attempt to study in depth the effect of implementing an AVB programme on children with autism and to evaluate the children's performance and progress by the researcher, the teachers, the parents and the independent psychologist

8.5 Contribution to Knowledge.

This research has contributed to knowledge of the current research regarding the implementation of an AVB Programme as an educational provision and its effects on the child and the parents. The summary of contribution is as follows:

- The AVB techniques have been shown to be effective in young children with autism. Effective behavioural intervention include a variety of techniques such as, modelling, prompting, shaping, fading, task analysis, and differential reinforcement, along with precise behaviour quantification and frequent measurement.
- The AVB intervention has demonstrated effectiveness in a wide range of areas across all three core deficits that define autism (mal-adaptive behaviour, communication, social interactions).
- Reductions in the diagnostic symptoms of autism of the children participated in the study.
- Parents, other adults and peers can be trained to implement the AVB techniques.

- The AVB can be effective in helping to achieve positive outcomes for both the child and the family.

- Parental involvement improves generalisation of skills to the home and the family environment of the child.

- Parents can be trained in using AVB methods and can function as active participants in the intervention process. After the AVB implementation, parents' stress level did actually decrease.

- Use of functional analysis of behaviour incorporates ongoing monitoring of progress and encourages modification of techniques as needed.

- Securing a regular school placement for some of the participated children.

However, the AVB intervention was limited by several factors:

- AVB intervention requires a large number of well trained individuals to administer the intervention.

- AVB requires a high degree of coordination and supervision of the individuals administering the interventions.

- AVB can be disruptive to the family.

- Expectations associated with parent training may increase parental stress.

- AVB can be expensive for poor financed families, as all the participated children come from middle – class families.

- A specific technique should be used to train for generalisation. For instance, skills acquired with specific AVB techniques in the school setting may not generalize to

the child's home setting. The generalization across settings should be taught to the child using the AVB techniques.

- Even though the participated children in this study have achieved significant improvement, they remain with developmental difficulties.

8.6 Contribution to Methodology

The different use of methods for this research has contributed to the methodology, by using different methods to collect data and involving many parties who can evaluate the children's performance and report their progress from their own perspectives. For the present study, the researcher, the independent psychologist, the teachers and parents have evaluated the children's performance and progress using qualitative and quantitative approach. The assessment of the children were based on multiple baseline design (a set of different measures of the children, The CARS profile done by the independent psychologist, the children are then assessed against their own baselines which were established at the first testing). Several characteristics associated with the multiple baseline design make it a useful way to answer questions about the effects of AVB intervention. One aspect of the multiple baseline design that can be appealing to researchers is the ability of this method to measure behaviour in an applied setting where the AVB services are delivered. Within this context, the researcher was able to use this research design to examine the effects of the AVB intervention and document the outcomes on each individual child. In addition the positive outcomes of the children's performance following the AVB programme have impacted their parents which are

evident in the decrease of the parental stress level using the Parenting Stress Index Short Form PSI.

Data was collected using the following:

- "The BLAF" is an introductory and initial assessment of the "The ABLLS" both assessments were used by the researcher. "The ABLLS" methodology was tailored to meet the individualized needs of each child. In the classroom, targeted skills to be learned are broken down into small elements and systematically taught using positive reinforcement. In the beginning stages of instruction, priority was given to the acquisition of new constructive behaviours and the elimination of the inappropriate one such as, self-stimulatory, aggression, or self-injurious behaviours. Each goal is taught in carefully planned steps that allow the child to be successful. The objective of the AVB teaching methods is an increase in each child's functional repertoire. Fundamental behaviours such as the attending skills program (see chapter 4) is taught before complexity is added. As the child progresses, changes in goals/targets and adjustments in teaching strategy are driven by data collected continuously as the child is learning. ABA/AVB is based on data, data-based systems have many advantages , including monitoring the child's progress, determining whether teaching methods need to be modified in order to help to assure that all staff are working consistently and implementing the treatment programme as planned. A child with autism requires multiple opportunities to learn. It is essential to teach him/her new skills with repeated trials. Teaching was initially started one to one (then generalised in other settings

with other children), and each child works on a schedule of goals throughout his/her school's day.

- The evaluation form by parents and teachers was used for this study in order to report on the children's performance of specific skills from their own perspectives.

- The use of Childhood Autism Rating Scales "CARS" was used in order to measure the children's performance and the severity of their diagnosis pre & post AVB intervention by an independent psychologist.

- The Parenting Stress Index "PSI" Short Form was essential to use for this research in order to study the effects of implementing the AVB on the children's parent relationship by measuring their stress level pre & post AVB intervention.

However, the use of chosen methodology for this research was limited by several factors:

- Absence of randomized group to demonstrate that superiority of one program over another. This study has not used randomised group comparison designs because of the practical and ethical difficulties in randomly assigning children and families to treatment group.
- AVB requires treatment fidelity for successful implementation, thus parents and educators should be adequately trained prior to treatment intervention.

- Potential effects of experimenter bias exits when outcome assessments are conducted by individuals who know about the nature of the research study.

- Data collected by the staff may introduce a potential confounding effect. This confounding effect may be countered by having daily performance data for this study.

- The period of the AVB intervention was not the same for all the children as only three children have participated in the first year of the research and another seven children joined them for the second year.

- Lack of use of non-verbal tests such as Vinland adaptive scales.

8.7 Personal Learning and Challenges:

The researcher has experienced many learning opportunities and challenges during the process of doing this study.

As for the personal learning, the researcher was able to learn many things by will and effort, particularly as she has seen that the learning was relevant, her learning was enhanced when she was supported to develop strategies that promote learning. She needed to understand what it meant to learn, who she is as a learner, and how emotions affect learning. She had developed skills in planning, monitoring and revising her work.

It was very hard for the researcher to cope with many things at once, such as conducting the research, working at The Autistic Centre, to being a mother of three children, whom one of them is a child with autism. Her son has given her the idea to do the research in

the first place, he has given her the will to continue and not take anything for granted. Therefore, she became an advocate for children with autism although she used to be terrified of speaking in public. She supported The Autistic Centre by organising events to spread awareness about autism, conducting a parent support group, conducting workshops to other schools on the use of ABA/AVB programme, securing funding for poor financed families that cannot afford to pay for their children's fees at The Autistic Centre, and Working towards getting the teachers a recognised degree in teaching children with autism by a leading university in Beirut in collaboration with a British University.

The researcher has faced many challenges and difficulties in finding a centre to implement the AVB intervention, in due to the withdrawal of the participation of the Autism society from the AVB research, as a new society's president was elected. The researcher and other professional had to establish a society "The Autistic Centre" in order to provide provision for children with autism using the AVB approach.
The research was carried out with the support of "The Board of Trustees" at The Autistic Centre.

Considerable amount of time was invested into finding the suitable staff who can meet the criteria of being able to implement the AVB intervention.

This research has required a high degree of coordination and supervision by the researcher and the staff administering the AVB intervention.

The implementation of the AVB programme is expensive, as there are many requirements from buying the required materials to the large number of the educators who can administer the AVB intervention. In addition, the researcher's work at The Autistic Centre was on voluntary basis and she did not get paid for it. This issue has added more stress on her financial situations. The school's fees which were paid by the children's parent were just enough to cover the staff's salaries. The funding problems were solved by doing fundraising activities to cover the costs.

8.8 Suggestion for further research

This research has examined the effect of implementing an AVB programme on children with autism. It has raised some important questions which encourage exploring them for future research:

- Can Regular school with attached unit replicate similar results findings?
- Does the joint Approach by the school/teachers and parents for the sake of the child with autism have an impact on the child's teaching environment?
- Can older children with autism with no prior educational intervention benefit from the AVB intervention?
- Can AVB intervention be applied not only by professionals but also by trained paraprofessionals such as parents and others?
- What factors can contribute to a better speech/signs and communication for non verbal children?

- Questions remain regarding whether the effects of AVB will be maintained in the longer term.

- Can AVB be combined with other methods?

- Can group designs (controlled, randomised) studies yield similar results?

To conclude, working with children with autism is a work in progress and children need to be taught the skills they lack in a secure caring and motivating environment. The children, their parents, and their teachers all must be involved in the teaching and the learning process.

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Appendix A

DSM IV Diagnostic Criteria for 299.00 Autistic Disorders

A. A total of at least six items from (1), (2) and (3), with at least two from (1), and one each from (2) and (3):

1. Qualitative impairment in social interaction, as manifested by at least two of the following: marked impairment in the use of multiple nonverbal behaviors such as eye-to eye gaze, facial expression, body postures, and gestures to regulate social interaction; failure to develop peer relationships appropriate to developmental level; a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g. by a lack of showing, bringing, or pointing out objects or interest) lack of social or emotional reciprocity.

2. Qualitative impairments in communications as manifested by at least one of the following: delay in, or total lack of, the development of spoken language) not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime). In individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others; stereotyped and repetitive use of language or idiosyncratic language lack of varied, spontaneous make – believe play or social imitative play appropriate to developmental level.

3. Restricted repetitive and stereotyped patterns of behaviour, interests, and activities, as manifested by at least one of the following: encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus apparently inflexible adherence to specific, non-functional routines or rituals stereotyped and repetitive motor mannerisms (e.g. hand or finger flapping or twisting, or complex whole body movements) persistent preoccupation with parts of objects.

B. Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years: (1) social interaction, (2) language as used in social communication, or (3) symbolic or imaginative play.

C. The disturbance is not better accounted for by Rett's Disorder or Childhood Disintegrative Disorder.

Appendix B

DSM-IV Diagnostic Criteria for 299.80 Pervasive Developmental Disorder, Not Otherwise Specified (PDD-NOS)

This category should be used when there is a severe and pervasive impairment in the development of reciprocal social interaction or verbal and nonverbal communication skills, or when stereotyped behaviour, interests, and activities are present, but the criteria are not met for a specific pervasive developmental disorder, schizophrenia, schizotypal personality disorder, or avoidant personality disorder. For example, this category includes "atypical autism" --presentations that do not meet the criteria for autistic disorder because of late age of onset, atypical symptomatology, or sub threshold symptomatology, or all of these.

Source: The American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Washington D.C., American Psychiatric Association, 1994.

Appendix C

DSM- IV Diagnostic Criteria for 299.10 Childhood Disintegrative Disorder or Heller's Syndrome

A. Apparently normal development for at least the first 2 years after birth as manifested by the presence of age-appropriate verbal and nonverbal communication, social relationships, play, and adaptive behaviour.

B. Clinically significant loss of previously acquired skills (before age 10 years) in at least two of the following areas:

(1) Expressive or receptive language

(2) Social skills or adaptive behaviour

(3) Bowel or bladder control

(4) Play

(5) Motor skills

C. Abnormalities of functioning in at least two of the following areas:

(1) Qualitative impairment in social interaction (e.g., impairment in nonverbal behaviors, failure to develop peer relationships, lack of social or emotional reciprocity)

(2) qualitative impairments in communication (e.g., delay or lack of spoken language, inability to initiate or sustain a conversation, stereotyped and repetitive use of language, lack of varied make-believe play)

(3) Restricted, repetitive, and stereotyped patterns of behaviour, interests, and activities, including motor stereotypes and mannerisms

DD. The disturbance is not better accounted for by another specific pervasive developmental disorder or by schizophrenia.

Source: The American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Washington D.C., American Psychiatric Association, 1994.

Appendix D

DSM-IV Diagnostic Criteria for 299.80 Asperger's Disorder (or Asperger Syndrome)

An Asperger/HFA screening tool must meet all six areas defined by the DSM-IV description of Asperger Syndrome (A-F below) to qualify for a positive rating from First Signs:

A. Qualitative impairment in social interaction, as manifested by at least two of the following:

(1) Marked impairment in the use of multiple nonverbal behaviors, such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction

(2) Failure to develop peer relationships appropriate to developmental level

(3) A lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest to other people)

(4) Lack of social or emotional reciprocity

B. Restricted, repetitive, and stereotyped patterns of behaviour, interests, and activities, as manifested by at least one of the following:

(1) Encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus

(2) Apparently inflexible adherence to specific, non-functional routines or rituals

(3) Stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, or complex whole-body movements)

(4) Persistent preoccupation with parts of objects

C. The disturbance causes clinically significant impairment in social, occupational, or other important areas of functioning.

D. There is no clinically significant general delay in language (e.g., single words used by age 2 years, communicative phrases used by age 3 years).

E. There is no clinically significant delay in cognitive development or in the development of age-appropriate self-help skills, adaptive behaviour (other than in social interaction), and curiosity about the environment in childhood.

F. Criteria are not met for another specific pervasive developmental disorder or schizophrenia.

Appendix E

DSM- IV Diagnostic Criteria for 299.80 Rhett's Disorder (or Rhett Syndrome)

A. All of the following:

(1) Apparently normal prenatal and perinatal development

(2) Apparently normal psychomotor development through the first 5 months after birth

(3) Normal head circumference at birth

B. Onset of all of the following after the period of normal development:

(1) Deceleration of head growth between ages 5 and 48 months

(2) Loss of previously acquired purposeful hand skills between ages 5 and 30 months with the subsequent development of stereotyped hand movements (i.e., hand-wringing or hand washing)

(3) Loss of social engagement early in the course (although often social interaction develops later)

(4) Appearance of poorly coordinated gait or trunk movements

(5) Severely impaired expressive and receptive language development with severe psychomotor retardation.

Source: The American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Washington D.C., American Psychiatric Association, 1994.

Appendix F

Autism increases 870% in the United States, 1992-93 to 2002-03

State	1992-93	2002-03	Percentage Increase
Alabama	68	1,096	1,512
Alaska	8	259	3,138
Arizona	199	1,689	749
Arkansas	30	912	2,940
California	1,605	16,093	901
Colorado	14	688	4,814
Connecticut	164	1,754	968
Delaware	15	345	2,400
District of Columbia	0	179	-
Florida	582	5,117	779
Georgia	262	3,057	1,068
Hawaii	52	528	915
Idaho	39	480	1,131
Illinois	5	5,080	101,500
Indiana	273	3,975	1,761
Iowa	67	1,148	1,613
Kansas	74	878	1,086
Kentucky	38	1,171	2,982
Louisiana	409	1,493	265
Maine	37	675	1,724
Maryland	28	2,962	10,474

Massachusetts	493	3,193	857
Michigan	288	5,463	1,797
Minnesota	296	4,116	1,291
Mississippi	0	537	-
Missouri	336	2,254	568
Montana	20	232	1,060
Nebraska	4	481	11,925
Nevada	5	684	13,580
New Hampshire	0	491	-
New Jersey	446	4,180	837
New Mexico	16	311	1,843
New York	1,648	8,274	402
North Carolina	786	3,518	348
North Dakota	9	178	1,878
Ohio	22	4,017	18,159
Oklahoma	31	829	2,574
Oregon	37	3,339	8,924
Pennsylvania	346	4,836	1,298
Puerto Rico	266	531	100
Rhode Island	19	471	2,389
South Carolina	141	1,168	728
South Dakota	36	285	692
Tennessee	304	1,359	347
Texas	1,444	8,576	484
Utah	105	843	703
Vermont	6	247	4,033
Virginia	539	2,966	450

Washington	476	2,344	392
West Virginia	101	429	325
Wisconsin	18	2,739	15,117
Wyoming	15	132	780
Total	**12,222**	**118,602**	**+870 overall**

Source: IIDEA data, US Department of Education, http://www.ideadata.org

Schaffer Autism Report, October 27, 2003, Vol. 7, No 217.

Appendix G

Childhood Autism Rating Scales

CARS
By Eric Schopler (1988)

The assessor rates the behaviours relevant to each item of the scale. For each item, the

assessor circles the number which corresponds to the statement that best describes the

child. The assessor may indicate the child between two descriptions by using ratings of

1.5, 2.5, or 3.5.

C.A.R.S. assesses children in the following areas:

1. Relation to people: This is a rating of how the child behaves in a variety of

    situations involving interaction with other people:

    > 1 – 1.5 No evidence of difficulty or abnormality in relating to people.
    > 2- 2.5   Mildly abnormal relationships.
    > 3 – 3.5 Moderately abnormal relationships.
    > 4.   Severely abnormal relationships.

2. Imitation: This rating is based on how the child imitates both verbal and non

    verbal acts:

    > 1 - 1.5 Appropriate imitation.
    > 2 - 2.5 Mildly abnormal imitation.
    > 3 - 3.5 Moderately abnormal imitation
    > 4   Severely abnormal imitation.

3. Emotional Response: This rating of how the child reacts to both pleasant and

    unpleasant situations:

    > 1 – 1.5 Age appropriate and situation appropriate emotional responses.

2- 2.5   Mildly abnormal emotional responses.
3 – 3.5 Moderately abnormal emotional responses.
4.   Severely abnormal emotional responses.

4. Body Use: This scale represents a rating of both coordination and appropriateness

of body movements:

1 – 1.5 Age appropriate body use.
2- 2.5   Mildly abnormal body use.
3 – 3.5 Moderately abnormal body use.
4.   Severely abnormal body use

5. Objects Use: This is a rating both of the child's interest in toys or other objects,

and his uses of them:

1 – 1.5 Appropriate use of, and interest in, toys and other objects.
2- 2.5   Mildly inappropriate use of, and interest in, toys and other objects.
3 – 3.5 Moderately inappropriate use of, and interest in, toys and other objects.
4.   Severely inappropriate use of, and interest in, toys and other objects.
.

6. Adaptation to change: This scale concerns difficulties in changing established

routines or difficulties in changing from one activity to another:

1 – 1.5 Age appropriate response to change.
2- 2.5   Mildly abnormal adaptation to change.
3 – 3.5 Moderately abnormal adaptation to change.
4.   Severely abnormal adaptation to change.

7. Visual response: This is a rating of unusual visual attention patterns found in many

autistic children:

1 – 1.5 Age appropriate visual response.
2- 2.5   Mildly abnormal visual response.
3 – 3.5 Moderately abnormal visual response.
4.   Severely abnormal visual response.

8. Listening response: This is a rating of unusual listening behaviour or unusual

   responses to sounds:

   > 1 – 1.5 Age appropriate listening response.
   > 2- 2.5   Mildly abnormal listening response.
   > 3 – 3.5 Moderately abnormal listening response.
   > 4.   Severely abnormal listening response.

9. Taste, Smell and Touch Response and Use: This is a rating of the child's response

   to stimulation of taste, smell and touch senses including pain:

   > 1 – 1.5 Normal use of, and response to, taste, smell, and touch.
   > 2- 2.5   Mildly abnormal use of, and response to, taste, smell, and touch.
   > 3 – 3.5 Moderately abnormal use of, and response to, taste, smell, and
   >   touch...
   > 4.   Severely abnormal use of, and response to, taste, smell, and touch.

10. Fear & Nervousness: This is a rating of unusual or unexplainable fears. However,

    it also includes rating of absence of fear:

    > 1 – 1.5 Normal fear or nervousness.
    > 2- 2.5   Mildly abnormal fear or nervousness.
    > 3 – 3.5 Moderately abnormal fear or nervousness.
    > 4.   Severely abnormal fear or nervousness.

11. Verbal Communication: This is a rating of all facts of the child's use of speech or

    language:

    > 1 – 1.5 Normal verbal communication, age and situation appropriate.
    > 2- 2.5   Mildly abnormal verbal communication.
    > 3 – 3.5 Moderately abnormal verbal communication.
    > 4.   Severely abnormal verbal communication.

12. Non - Verbal Communication: This is a rating of the child's nonverbal

communication through the use of facial expression, posture, and gesture and body

movement:

> 1 – 1.5 Normal use of nonverbal communication.
> 2- 2.5 Mildly abnormal use of nonverbal communication.
> 3 – 3.5 Moderately abnormal use of nonverbal communication.
> 4.   Severely abnormal use of nonverbal communication.

13. Activity Level: This rating refers to how much the child moves about in both

restricted and non restricted situations:

> 1 – 1.5 Normal activity level for age and circumstances.
> 2- 2.5 Mildly abnormal activity level.
> 3 – 3.5 Moderately abnormal activity level.
> 4.   Severely abnormal activity level.

14. Level and Consistency of Intellectual Response:

> 1 – 1.5 Intelligence is normal and reasonably consistent across various
>   areas.
> 2- 2.5 Mildly abnormal intellectual functioning.
> 3 – 3.5 Moderately abnormal intellectual functioning.
> 4.   Severely abnormal intellectual functioning.

15. General Impressions: Subjective impression of the degree to which a child is

autistic:

> 1 – 1.5 No autism.
> 2- 2.5 Mild autism.
> 3 – 3.5 Moderate autism.
> 4.   Severe autism.

Appendix H

The Behavioural Language Assessment Form

The BLAF
By Sundberg & Partington (1998)

Name: _____ Age: _____ Date: _____

	Cooperation	Request	Motor Imitation	Vocal Play	Vocal Imitation	Match to Sample	Receptive	Labelling	R by FFC	Conversation	Letters and Numbers	Social Interaction
5												
4												
3												
2												
1												

For the following question, indicate the level of performance that best describes the learner's typical level of performance.

I.   COOPERATIONS WITH ADULTS _____ (enter score).
How easy is it to work with the child?

1. Always uncooperative, avoids work, engages in negative behaviour.
2. Will do only one brief and easy response for a powerful reinforcer.
3. Will give 5 responses without disruptive behaviour.
4. Will work for 5 minutes without disruptive behaviour.
5. Works well for 10 minutes at a table without disruptive behaviour.

II.   REQUEST (MANDS) _____
How does the learner let his needs and wants be known?

1. cannot ask for reinforcers; or engages in negative behaviour
2. pulls people, points, or stands by reinforcing items
3. uses 1-5 words, signs or pictures to ask for reinforcers
4. uses 5-10 words, signs or pictures to ask for reinforcers
5. Frequently requests using 10 or more words, signs, or pictures.

III.   MOTOR IMITATION _____
Does the learner copy actions?

1. cannot imitate anybody's motor movements
2. imitates a few gross motor movements modelled by others
3. imitates several gross motor movements on request
4. imitates several fine and gross motor movements on request
5. easily imitates any fine or gross movements, often spontaneously

IV.   VOCAL PLAY _____
Does the learner spontaneously say sounds and words?

1. does not make any sounds (mute)
2. makes a few speech sounds at a low rate
3. vocalizes many speech sounds with varied notations
4. vocalizes frequently with varied intonation and says a few words
5. vocalizes frequently and says many clearly understandable words

V.   VOCAL IMITATION _____
Will the learner repeat sounds or words?

1. cannot repeat any sounds or words
2. will repeat a few specific sounds or words
3. will repeat or closely approximate several sounds or words
4. will repeat or closely approximate many different words
5. will clearly repeat any word, or even simple phrases

VI.   MATCHING TO SAMPLE _____
Will the learner match objects, pictures and designs to presented samples?

1. cannot match any objects or pictures to a sample
2. can match 1 or 2 objects or pictures to a sample
3. can match 5 to 10 objects or pictures to a sample
4. can match 5 to 10 colours, shapes, or designs to a sample
5. can match most items and match 2 to 4 block designs

VII.   RECEPTIVE _____
Does the learner understand any words or follows directions?

1. cannot understand any words
2. will follow a few instructions related to daily routines
3. will follow a few instructions to do actions or touch items
4. can follow many instructions and point to at least 25 items
5. can point to at least 100 items, actions, persons or adjectives

VIII.   LABELLING (TACTS) _____
Does the learner label or verbally identify any items or actions?

1. cannot identify any items or actions
2. identifies only 1 to 5 items or actions
3. identifies 6 to 15 items or actions
4. identifies 16 to 50 items or actions
5. identifies over 100 items or actions and emits short sentences

IX.   RECEPTIVE BY FUNCTION, FEATURE, AND CLASS _____
Does the learner identify items when given information about those items?

1. cannot identify items based on information about them
2. will identify a few items given synonyms or common functions
3. will identify 10 items given 1 of 3 functions or features
4. will identify 25 items given 4 functions, features, or classes
5. will identify 100 items given 5 functions, features or classes

X.   CONVERSATION SKILLS (INTRAVERBALS) _____
Can the learner fill-in missing words or answer questions?

1. cannot fill-in missing words or parts of songs
2. can fill-in a few missing words or provide animal sounds
3. can fill-in 10 non-reinforcing phrases or answer at least 10 simple questions
4. can fill-in 20 phrases or can answer 20 questions with variation
5. can answer at least 30 questions with variation

XI.   LETTERS AND NUMBERS _____
Does the learner know any letters, numbers, or written word?

1. cannot identify any letters, numbers, or written words
2. can identify at least 3 letters or numbers
3. can identify at least 15 letters or numbers
4. can read at least 5 words and identify 5 numbers
5. can read at least 25 words and identify 10 numbers

XII.   SOCIAL INTERACTION _____
Does the learner initiate and sustain interactions with others?

1. does not initiate interactions with others
2. physically approaches others to initiate an interaction

3. readily asks adults for reinforcers
4. verbally interacts with peers with prompts
5. regularly initiates and sustains verbal interactions with peers

Appendix I

The Assessment of Basic Language and Learning Skills

"The ABLLS"
By Sundberg & Partington (1998)

The ABLLS was used to determine the children's skills in each of the 25 areas of the assessment. The ABLLS is an exhaustive list of items and can not be included in an appendix therefore only the title of each area will be included.

Basic learner skills section which includes:

A. Cooperation and Reinforcer effectiveness. (11 items)

B. Visual performance. (21 items).

C. Receptive Language. (52 items).

D. Imitation. (13 items)

E. Vocal Imitation. (9 items)

F. Requests. (27 items)

G. Labelling. (42 items)

H. Intraverbals. (42 items).

I. Spontaneous vocalizations. (9 items).

J. Syntax and Grammar. (20 items).

K. Play and leisure. (10 items).

L. Social interaction. (22 items).

M. Group instruction. (12 items).

N. Classroom routine. (10 items).

P. Generalized responding. (6 items).

Academic Skills section which includes:

Q. Reading. (15 items).

R. Math. (42 items).

S. Writing. (9 items).

T. Spelling. (6 items).

Self help skills section which includes:

U. Dressing. (15 items).

V. Eating. (10 items).

W. Grooming. (7 items).

X. Toileting. (10 items).

Motor Skills Section which includes:

Y. Gross motor. (28 items).

Z. Fine motor. (28 items).

Appendix J

Evaluation Form

Pre AVB

Parent □   **Teacher**   □

Child's Name: _____   Child's Age: _____

School: _____   Time started: _____

Parent / Teacher: _____   Time ended: _____

SECTION 1   PERSONAL DETAILS

1.1 What is your child's diagnosis? (Please circle one only)

1. Autism /Autistic Spectrum Disorder (ASD)
2. Asperger Syndrome (AS)
3. Pervasive Development Disorder (PDD)
4. Rett's Syndrome
5. Landau Kleffner
6. Pervasive Development Disorder Not Otherwise Specified(PDD – NOS)
7. Other

1.2. In your opinion, how affected by his disability is your child?

1(least)   2   3   4   5   6   7   8(most)

SECTION 2	BEHAVIOUR

Please describe your child behaviour before the implementation of ABA/AVB program:

2.1 Does the child display any self-injurious behaviour or aggressive behaviour towards others?

    □ Yes   □ No

2.2 If yes, what are they and when do they occur (please indicate all that apply)?

Self-injurious behaviour or aggressive behaviour	When Excited	When Frustrated	When under - stimulated	Rarely	Other (please specify)
1.					
2.					
3.					
4.					
5.					
6.					
7.					

2.3 How many times per day do the behaviour(s) occur?

Self injurious behaviour or aggressive behaviour	Less than 1	1-5	6-10	11-15	More than 15
1.					
2.					
3.					
4.					
5.					
6.					
7.					

2.4 Are these behaviours still severe after the implementation of the program; for example have they caused permanent physical damage?

_____
_____
_____

2.5 Does the child engage in self-stimulatory behaviour?

          □ Yes   □ No

2.6 If yes, Please tick the behaviours that the child engages in? (Please indicate which sensory mechanisms are being stimulated for each behaviour?

Self -stimulatory behaviour	Verbal	Oral	Gross motor	Olfactory (smell)	Tactile (feel)
1.Sucking and mouthing clothes					
2. Hands and feet					

restless					
3. closing and opening doors					
4. spinning objects					
5. flapping objects					
6. Smelling people/objects					
7. Others					

2.7 When does the behaviour (s) occur? (Please tick as many that apply).

Self -stimulatory behaviour	When excited	When frustrated	When under stimulated	Rarely	Others (please specify)
1. Sucking and mouthing clothes					
2. Hands and feet restless					
3. closing and opening doors					
4. spinning objects					
5. flapping objects					
6. Smelling people/objects					
7. Others					

2.8 How many times per day does the behaviour (s) occur?

Self -stimulatory behaviour	Less than 1	1-5	6-10	11-15	More than 15
1. Sucking and mouthing clothes					
2. Hands and feet restless					
3. closing and opening doors					
4. spinning objects					
5. flapping objects					
6. Smelling people/objects					
7. Others					

SECTION 3	PROGRESS AND DEVELOPMENT

3.1 Does your child have any behavioural or physical difficulties?

□ Yes   □ No

3.2 Behavioural:

Items	Severe	Moderate	Mild	N/A
1. Tantrums				
2. Self abuse				
3. Aggression				
4. Self stim				
5. Other major disruptive behaviour				
6. Leaves work area				
7. Attention Span				
8.Eye to Eye Contact (looking on request)				
9. Looking when name is called				
10. Looking when talking or listening				
11. Looking at Task materials				
12.Follows simple instructions and gestures				

3.3Compliance

Items	Severe	Moderate	Mild	N/A
1. Come here from 1 feet away				
2. Come here across room				
3. Come here from different parts of house				
4. Come here from when he is outside at close distance				
5. Come here from outside at longer distance				
6. Follow instructions to sit down				
7. Follow instructions to stand up				
8. Follow instructions to put				

Hands down				
9. Retrieve objects from table				
10. Retrieve objects from floor				
11. Retrieve objects from 5 feet away				
12.Retrieve objects from across room				

3.4 Waiting:

Items	Severe	Moderate	Mild	N/A
Wait to hear instructions				
While parent/teacher gets reinforcer				
To take turn in preferred activity				
Waiting for high reinforcer for up to 2 min. /later				

3.5 Performs skills in different situations:

Items	Severe	Moderate	Mild	N/A
With different children				
With different people				
In different places				
Generalize appropriate behaviour and compliance in many different setting				

3.6Receptive language:

Items	Severe	Moderate	Mild	N/A
Come here				
Sit down				
Look at me_				
Responding to his name				
Go to….(NAME)				

Communication Repertoire:

3.7 Receptive Behaviour:

Items	Severe	Moderate	Mild	N/A
Sits still when told for at least 10 seconds				
maintain eye contact for 1 second when told ….look at me				
Imitates non verbal gestures ("DOES THIS")				
Follows vocal verbal commands in 1:1 setting :				
One step command				
two steps command				
three steps command				
Discriminates actions by demonstrating (e.g. show me eating)				
Discriminates actions by point to pictures (e.g. point to sleeping)				
Retrieve a list of at least five objects (e.g. give me cup, water and book)				

3.8 Expressive Behaviour: using either word, sign, pictures exchange system, pointing or lead to

Items	Severe	Moderate	Mild	N/A
Uses appropriate verbal behaviour, point or leads to rather than cry/tantrum				
Uses appropriate verbal behaviour to mand				
Uses appropriate verbal behaviour/points to get attention				
Echoes (or point if he is non- verbal) to single words, 3-5 words.				
Mands for objects, activities, and individuals using words gestures, sign				

Items	Severe	Moderate	Mild	N/A
or picture				
Simple mands (one or two words)				
Mands plus please				
Several autoclitics in mands such "I want …. Please"				
Auto-clitics in tacts in sentences such as "It is bread"				
Mands for help or assistance from others				
Mands to play with peers				
Tacts actual objects, activities using Single words				
Tacts Auto-clitics in phrases				
Tacts actions (running sleeping, eating etc...)				
Using single words				
Using I'm (e.g. I am eating)				
Uses more/less				
As a mand (e.g. more cookie)				
As a tact (there is more)				

3.9 Social Intraverbals:

Items	Severe	Moderate	Mild	N/A
greets others with hi				
Responds appropriately to "how are you?"				
Say/ wave bye to others				
says common nursery rhymes or sings songs				

3.10 Non verbal imitation:

Items	Severe	Moderate	Mild	N/A
Gross motor				
Fine motor				
Oral motor				
Object use Chaining				

3.11 Matching and sorting:

Items	Severe	Moderate	Mild	N/A
3D to 3D				
2D to 2D				
2D to 3D				
3D to 2D				
non identical				
Matching letters				
Matching numbers				
Associative matching				
Matching blocks sequence				

3.12 Play skills:

Items	Severe	Moderate	Mild	N/A
puzzles,				
ball play				
sharing taking turn				
simple toy play pretend play				
one to one playmate				
board games				
helping others				
Group peer play				

3.13 Object labelling:

Items	Severe	Moderate	Mild	N/A
Receptive objects				
labels Receptive Action				
labels Expressive object labels				

3.14 Verbal imitation:

Items	Severe	Moderate	Mild	N/A
sounds				
Words syllables				
Articulation				
Volume/ tone				

3.15 Abstract concept:

Items	Severe	Moderate	Mild	N/A
Colours				
shapes				
Size				
Categories				

3.16 Sentence structure:

Items	Severe	Moderate	Mild	N/A
I want				
I have				
I see				

3.17 Academic works:

Items	Severe	Moderate	Mild	N/A
Letters Reading				
Numbers and counting				
Writing and drawing				
Worksheets				
Observation learning				
Looking at/Reading books				
Spelling				
circle time				
Independent work				
group activity works				

3.18 Social Repertoire:

Items	Severe	Moderate	Mild	N/A
Circle game				
greeting people				
social interaction				
simple conversation				
getting and giving simple information				
Play in same play area with peers/other children without disrupting peer activity				

3.19 Self help skills:

Items	Severe	Moderate	Mild	N/A
Dressing/undressing				
Toilet independent				
Request to use the bathroom appropriately				
No school accident during the school day				
uses spoon or fork to eat				
uses knife to cut or spread				
drinks from a straw				
drinks from a cup without spilling				
uses napkin				
swallows food before taking more food into mouth				
pours liquid without spilling				
carries plate to and from table				
throws away leftovers				
Hangs hits coat up				
Wear his hat				
having a hair cut without disruptive behaviour				
Washes and dries hands				
Brushes teeth				
tidy things away				
Wipes nose				

Appendix J

Evaluation Form
Post AVB

To investigate the effects of implementing an AVB program on children with autism (academic year October to June) from the view of

Parent ☐   **Teacher** ☐

Child's Name: _____   Child's Age: _____

School: _____   Time started: _____

Parent / Teacher: _____   Time ended: _____

SECTION 1   PERSONAL DETAILS

1.1 What is your child's diagnosis? (Please circle one only)

8. Autism /Autistic Spectrum Disorder (ASD)
9. Asperger Syndrome (AS)
10. Pervasive Development Disorder (PDD)
11. Rett's Syndrome
12. Landau Kleffner
13. Pervasive Development Disorder Not Otherwise Specified(PDD – NOS)
14. Other

1.2. In your opinion, how affected by his disability is your child?

1(least)   2   3   4   5   6   7   8(most)

SECTION 2	BEHAVIOUR

Please describe your child behaviour after the implementation of ABA/AVB program in the school:

2.1 Does the child display any self-injurious behaviour or aggressive behaviour towards others?

  □ Yes   □ No

2.2 If yes, what are they and when do they occur (please indicate all that apply)?

Self-injurious behaviour or aggressive behaviour	When Excited	When Frustrated	When under - stimulated	Rarely	Other (please specify)
1.					
2.					
3.					
4.					
5.					
6.					
7.					

2.3 How many times per day do the behaviour(s) occur?

Self injurious behaviour or aggressive behaviour	Less than 1	1-5	6-10	11-15	More than 15
1.					
2.					
3.					
4.					
5.					
6.					
7.					

2.4 Are these behaviours still severe after the implementation of the program; for example have they caused permanent physical damage?

_____
_____
_____

2.5 Does the child engage in self-stimulatory behaviour?

  □ Yes   □ No

2.6 If yes, Please tick the behaviours that the child engages in? (Please indicate which sensory mechanisms are being stimulated for each behaviour?

Self -stimulatory behaviour	Verbal	Oral	Gross motor	Olfactory (smell)	Tactile (feel)
1.Sucking and mouthing					

clothes					
2. Hands and feet restless					
3. closing and opening doors					
4. spinning objects					
5. flapping objects					
6. Smelling people/objects					
7. Others					

2.7 When does the behaviour (s) occur? (Please tick as many that apply).

Self -stimulatory behaviour	When excited	When frustrated	When under stimulated	Rarely	Others (please specify)
1. Sucking and mouthing clothes					
2. Hands and feet restless					
3. closing and opening doors					
4. spinning objects					
5. flapping objects					
6. Smelling people/objects					
7. Others					

2.8 How many times per day does the behaviour (s) occur?

Self -stimulatory behaviour	Less than 1	1-5	6-10	11-15	More than 15
1. Sucking and mouthing clothes					
2. Hands and feet restless					
3. closing and opening doors					
4. spinning objects					
5. flapping objects					
6. Smelling people/objects					
7. Others					

SECTION 3	PROGRESS AND DEVELOPMENT

3.1 Have you noticed any behavioural or physical changes in your child whom you can contribute to ABA/AVB program? □ Yes   □ No

3.2 Behavioural:

Items	Regressed	No change	Significant improvement	N/A
1. Tantrums				
2. Self abuse				
3. Aggression				
4. Self stim				
5. Other major disruptive behaviour				
6. Leaves work area				
7. Attention Span				
8.Eye to Eye Contact (looking on request)				
9. Looking when name is called				
10. Looking when talking or listening				
11. Looking at Task materials				
12.Follows simple instructions and gestures				

3.3Compliance

Items	Regressed	No change	Significant improvement	N/A
1. Come here from 1 feet away				
2. Come here across room				
3. Come here from different parts of house				
4. Come here from when he is outside at close distance				
5. Come here from outside at longer distance				
6. Follow instructions to sit				

down				
7. Follow instructions to stand up				
8. Follow instructions to put Hands down				
9. Retrieve objects from table				
10. Retrieve objects from floor				
11. Retrieve objects from 5 feet away				
12.Retrieve objects from across room				

3.4 Waiting:

Items	Regressed	No change	Significant improvement	N/A
Wait to hear instructions				
While parent/teacher gets reinforcer				
To take turn in preferred activity				
Waiting for high reinforcer for up to 2 min. /later				

3.5 Performs skills in different situations:

Items	Regressed	No change	Significant improvement	N/A
With different children				
With different people				
In different places				
Generalize appropriate behaviour and compliance in many different setting				

3.6Receptive language:

Items	Regressed	No change	Significant improvement	N/A
Come here				
Sit down				

Look at me_				
Responding to his name				
Go to….(NAME)				

Communication Repertoire:

3.7 Receptive Behaviour:

Items	Regressed	No change	Significant improvement	N/A
Sits still when told for at least 10 seconds				
maintain eye contact for 1 second when told ….look at me				
Imitates non verbal gestures ("DOES THIS")				
Follows vocal verbal commands in 1:1 setting :				
One step command				
two steps command				
three steps command				
Discriminates actions by demonstrating (e.g. show me eating)				
Discriminates actions by point to pictures (e.g. point to sleeping)				
Retrieve a list of at least five objects (e.g. give me cup, water and book)				

3.8 Expressive Behaviour: using either word, sign, pictures exchange system, pointing or lead to

Items	Regressed	No change	Significant improvement	N/A
Uses appropriate verbal behaviour, point or leads to rather than cry/tantrum				
Uses appropriate verbal behaviour to mand				
Uses appropriate verbal				

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behaviour/points to get attention				
Echoes (or point if he is non- verbal) to single words, 3-5 words.				
Mands for objects, activities, and individuals using words gestures, sign or picture				
Simple mands (one or two words)				
Mands plus please				
Several autoclitics in mands such "I want …. Please"				
Auto-clitics in tacts in sentences such as "It is bread"				
Mands for help or assistance from others				
Mands to play with peers				
Tacts actual objects, activities using Single words				
Tacts Auto-clitics in phrases				
Tacts actions (running sleeping, eating etc...)				
Using single words				
Using I'm (e.g. I am eating)				
Uses more/less				
As a mand (e.g. more cookie)				
As a tact (there is more)				

3.9 Social Intraverbals:

Items	Regressed	No change	Significant improvement	N/A
greets others with hi				
Responds appropriately to "how are you?"				
Say/ wave bye to others				
says common nursery rhymes or sings songs				

3.10 Non verbal imitation:

Items	Regressed	No change	Significant improvement	N/A
Gross motor				
Fine motor				
Oral motor				
Object use Chaining				

3.11 Matching and sorting:

Items	Regressed	No change	Significant improvement	N/A
3D to 3D				
2D to 2D				
2D to 3D				
3D to 2D				
non identical				
Matching letters				
Matching numbers				
Associative matching				
Matching blocks sequence				

3.12 Play skills:

Items	Regressed	No change	Significant improvement	N/A
puzzles,				
ball play				
sharing taking turn				
simple toy play pretend play				
one to one playmate				
board games				
helping others				
Group peer play				

3.13 Object labelling:

Items	Regressed	No change	Significant improvement	N/A
Receptive objects				
labels Receptive Action				
labels Expressive object labels				

3.14 Verbal imitation:

Items	Regressed	No change	Significant improvement	N/A
sounds				
Words syllables				
Articulation				
Volume/ tone				

3.15 Abstract concept:
Do you think that ABA/AVB program helped your child to recognize the abstract concept of?

Items	Regressed	No change	Significant improvement	N/A
Colours				
shapes				
Size				
Categories				

3.16 Sentence structure:
Using ABA/AVB program with your helped him to use Phrases and simple sentences which have (signs or words):

Items	Regressed	No change	Significant improvement	N/A
I want				
I have				
I see				

3.17 Academic works:
Did your son academic performance improved due to the program?

Items	Regressed	No change	Significant improvement	N/A
Letters Reading				
Numbers and counting				
Writing and drawing				
Worksheets				
Observation learning				
Looking at/Reading books				
Spelling				
circle time				
Independent work				
group activity works				

3.18 Social Repertoire:

Items	Regressed	No change	Significant improvement	N/A
Circle game				
greeting people				
social interaction				
simple conversation				
getting and giving simple information				
Play in same play area with peers/other children without disrupting peer activity				

3.19 Self help skills:

Items	Regressed	No change	Significant improvement	N/A
Dressing/undressing				
Toilet independent				
Request to use the bathroom appropriately				
No school accident during the school day				
uses spoon or fork to eat				
uses knife to cut or spread				
drinks from a straw				
drinks from a cup without spilling				
uses napkin				
swallows food before taking more food into mouth				
pours liquid without spilling				
carries plate to and from table				
throws away leftovers				
Hangs hits coat up				
Wear his hat				
having a hair cut without disruptive behaviour				
Washes and dries hands				
Brushes teeth				
tidy things away				
Wipes nose				

SECTION 4   PERSONAL VIEWS

4.1 What were your goals prior to starting ABA program for your son?

_____
_____
_____

4.2 Did you find your goals changed as you proceeded through the program?
   1. Yes
   2. No
   3. Not sure

4.3 How did they change?

4.4 Did you reach your goals?
   1. Yes
   2. No
   3. Not sure

4.5 Please explain:

_____
_____

4.6 Did you encounter any surprises during program?
   1. Yes
   2. No
   3. Not sure

4.7 Did you consider these surprises as positive for your son?
   1. yes
   2. No
   3. Not sure

4.8 Please explain:

_____
_____

4.9 Was there anything you dislike about ABA/AVB program?
   1. Yes
   2. No

3. Not sure

4.10 Please explain:

_____
_____
_____

4.11 Did you feel you were provided with adequate education and support during your use of ABA? AVB program?

1. Yes
2. No
3. Not sure

4.12 Would you recommend ABA/AVB program to others?
1. Yes
2. No
3. Not sure

4.13 Why?

_____

_____

_____

4.14 In the next statement, choose your response from the choices 1 to 5 below:
After receiving the ABA/AVB approach I have found that getting my child to do something or stop doing something is:
1. much easier than I expected
2. somewhat easier than I expected
3. about as hard as I expected
4. somewhat harder than I expected
5. much harder than I expected

4.15 Any other comments about your experience of implementing an ABA/AVB program for your child?

_____
_____
_____

Signed   **Date:**

Appendix K

The Parenting Stress Index

PSI Short Form
By Psychological Assessment Resources Inc, 1995

Parenting Stress Index Short Form "PSI" is a questionnaire which contains 36 statements (a standardized test), where parents are instructed to read each statement carefully. For each statement, the parent are instructed to focus on the child who is the most they concerned about (the child participating in the study), and parents were requested to circle the response that best represented their opinion.

- Circling the SA if they strongly agree with the statement (5 points each).

- Circling the A if they agree with the statement (4points each).

- Circling the NS if they are not sure (3 points each).

- Circling D if they disagree with the statement (2 points each).

- Circling SD if they strongly disagree with the statement (1 point each).

Parents may circle one response only to each statement and they should respond to all statements. (The parents do not have the scores criteria). High scores indicate high stress level.

o   I often have the feeling that I cannot handle things very well.

o I find myself giving up more of my life to meet my children's needs than I ever expected.
o I feel trapped by my responsibilities as a parent.
o Since having this child, I have been unable to do new and different things.
o Since having a child, I feel that I am almost never able to do things that I like to do.
o I am unhappy with the last purchase of clothing I made for myself.
o There are quite a few things that bother me about my life.
o Having a child has caused more problems than I expected in my relationship with my spouse (male/female friend).
o I feel alone and without friends.
o When I go to a party, I usually expect not to enjoy myself.
o I am not as interested in people as I used to be.
o I don't enjoy things as I used to.
o My child rarely does things for me that make me feel good.
o Most times I feel that my child does not like me and does not want to be close to me.
o My child smiles at me much less than I expected.
o When I do things for my child, I get the feeling that my efforts are not appreciate very much.
o When playing, my child doesn't often giggle or laugh.
o My child doesn't seem to learn as quickly as most children.
o My child doesn't seem smile as much as most children.
o My child is not able to do as much as I expected.
o It takes a long time and it is very hard for my child to get used to new things.
o For the next statement, choose your response from the choices "1" to "5" below:

1. Not very good at being a parent.
2. A person who has some trouble being a parent.
3. an average parent
4. A better than average parent.
5. A very good parent.

o I expected to have closer and warmer feelings for my child than I do and this bothers me.
o Sometimes my child does things that bother me just to be mean.
o My child seems to cry or fuss more often than most children.
o My child generally wakes up in a bad mood.
o I feel that my child is very moody and easily upset.
o My child does a few things which bother me a great deal.
o My child reacts very strongly when something happens that my child doesn't like.
o My child gets upset easily over the smallest thing.
o My child's sleeping or eating schedule was much harder to establish than I expected.

- o for the next statement, choose your response from the choices "1" to "5" below:

1. Much harder than I expected.
2. Somewhat harder than I expected.
3. About as hard as I expected.
4. Somewhat easier than I expected.
5. Much easier than I expected.

- o For the next statement, choose your response from the choices "10+" to "1-3".

Think carefully and count the number of things which your child does that bother you. For example: dawdles, refuses to listen, overactive, cries, interrupts, fights, whines, etc…
- o There are some things my child does that really bother me a lot.
- o My child turned out to be more of a problem than I had expected.
- o My child makes more demands on me than most children.

Appendix L

Consent Form

September 2004,

Dear Parent or Guardian

I propose the undertaking of a study with the cooperation of The Autistic Centre. The intention of this research is to study the effects of implementing Applied Verbal Behaviour "AVB" Programme on children with autism in the areas of academic functioning, language functioning and adaptive functioning and to report on the children's progress or lack of progress from four parties: teachers, the parents, the independent agency and the researcher. This research is supervised by Professor Roy Evans at Brunel University.

Any data collected will remain confidential and for investigative purposes only including video footage. All information provided or obtained by the participants and all details which may identify a child will be kept confidential and replaced by alternative. All the participants' names will be changed including the school and the children's names, in addition to any identifying information which will be separated from the research data and only limited to the researcher and the research supervisor.

All teaching will be conducted in full agreement with The Autistic Centre's management and staff. No potentially harmful treatment will be used. The strategies and techniques of the Applied Verbal Behaviour "AVB" Programme which are based on the Applied Behaviour Analysis "ABA" application is widely recognized and used and they are not considered as experimental or harmful for the participants.

Your participation is voluntary and you have the right to withdraw from this study at any time. If you want to participate in this study, please fill the parental permission form and return it to The Autistic Centre.

If you would like to have a summary of the research results please provide us with your e-mail address.

If you have any questions, please feel free to contact me at xxxxxxx or e-mail at hgharbieh@xxxxxxx).

Sincerely,

Chafica Gharbieh
Brunel University

Parental permission Form

I have read the information provided and have been given the opportunity to have any questions answered.

I understand the implications of the study and hereby give permission for my child to participate.

Name of the child   Name of the parent/Guardian

Signature   Date

Appendix M

Ethical Consent

Submission to Brunel Department of education's Ethics Committee for Ethical Consent to undertake research

Name: Chafica Gharbieh
Award: PhD
Supervisor: Professor Roy Evans
Working title: Teaching children with autism and related disorders
Date: May 2003

Outline of the research
The purpose of this research is to study the effects of implementing an Applied Verbal Behavior "ABV" program in an autistic centre which is attached to a mainstream school. This proposed research would examine the effects of implementing an AVB program on the children's academic functioning language functioning and adaptive functioning.

A Synopsis of the literature review
My review of the literature highlighted the importance of an Applied Behavior Analysis "ABA" in teaching children with autism (Lovaas, 1987; McEachin, 1993).
However, the literature review showed lack of available data in teaching children with autism using the AVB model.

The increase usage of "AVB" approach in teaching children with autism led me to research this issue forward in order to examine the effects of implementing an "AVB" programme on the children's intellectual, language and social functioning.

Research questions:
1. Is "AVB" effective in teaching children with autism: Academic skills, Social skills, Self help skills and Gross and Fine motor skills?
2. Is "AVB" only effective as an early intervention?
3. Do older children benefit from the use of "AVB"?
4. Are the children more cooperative with teacher/parents request while receiving "AVB"?
5. Would the use of "AVB" with autistic children affect their parents stress level?
6. Is "AVB" an effective way to reduce mal-adaptive behaviour?

Methodology and research tools
As children with autism vary greatly with their capabilities and abilities, multiple methodologies are necessary to gain answers to specific research questions i.e. triangulation. Relaying on one method may be bias and could distort the researcher's picture of the particular slice of reality (Cohen, et al, 2001). Therefore, it is essential to use quantitative and qualitative approaches to gather data: assessments and tests of the children at school, semi- structured interview for staff and parents, and parental stress questionnaires.

Sample
The participants will be children with autism in a special school aged 4 to 18 years. (The children at this school have not been on AVB model before) there are two classes at the autism centre, one is for younger children aged 4 to 8 and the other class is for children aged 9 to 18 years. There are 5 to 6 students in each class.

Children undertaking the research have to meet the criteria of being at the school for a minimum of one academic year in order to have a base line assessment of each student, (acquisition rate, cognitive ability, and behaviour etc.) to valid the possible outcome of the children.

Ethical Issues
Ethical issues may arise in each stage in the research sequence which may be a potential source of ethical problems.

Ethical issues related to this study are as follows:

1. Issues relating to informed consent.
2. Participant right to Privacy: a. Anonymity; b. Confidentiality.
3. The participants and the researcher safety: a. physical issues; b. psychological issues.
4. The fidelity in delivering the intervention.

1. Issues relating to informed consent
The principles of informed consent arise from subject right to freedom and self – determination (Cohen, L, et al, **2001**). The participant has the right to refuse to take part or to withdraw from the research at any time thus informed consent implies informed refusal. All The participants will be given information about the aims, the procedures, and outcome of the research. As the main participants of this study will be children with autism, the issue of advocacy applies here. The requirement of informed consent would be met by obtaining the head teacher's permission to provide the researcher with an informed consent by the parents.

2. Participant's right to Privacy

Protecting the participant's right to privacy by Anonymity and confidentiality

a. Anonymity: all information provided or obtained by the participants should not in any way reveal their identities. Ensuring anonymity by not using the names of participants or any other personal means of identification.

b. Confidentiality

Protecting the participant's right to privacy through the assurance of confidentiality.

All identifying information gathered about the participants will be limited to my supervisor and me.

- Information will be treated with strict confidentiality.
- Changing the school name and all participants' names and separating identifying information from the research data.
- Releasing general information rather than specific (year of birth only rather than the specific date etc.).
- Interviewers will have the opportunity to verify statements when the research is in a draft form. (Bell, 1991).
- The use of video recording when conducting any assessments and tests, and the audiotapes for interviewers. Limiting the number of people who watch the videos or hear the audiotapes to my supervisor and myself.

3. The participants and the researcher safety:

a. Physical issues: Some children with autism have disruptive and aggressive behaviours towards themselves and others. As part of this study and in order to reduce the mal-adaptive behaviours a functional assessment must be conducted to determine the function of the behaviour. Mal adaptive behaviours are reinforced by four functions: to get attention, to escape and/ or avoidance of demands, to engage in self- stimulatory behaviour, and the needs for medical attention.

As a trained ABA/ AVB therapist and a mum of an autistic child I am fully trained to deal with such behaviour.

b. Psychological issues:

Placing demands on autistic children from a total stranger can trigger some aggressive and mal-adaptive behaviour. Therefore the use of pairing technique is going to be used to get the children to relate to me and to get used to my presence. I would be pairing my self with the student's teacher.

Children with autism have good and bad days to function. Therefore conducting any assessment or tests should be determined with the teacher to rule out any medical conditions, which might affect the validity of the tests. There is a range of issues

which might affect the reliability of the test, such as the time of the days the individual's motivation, concentration, etc.

4. **The fidelity in delivering the intervention:** how faithful people or staffs are delivering the intervention of AVB. For this reason and in order to ensure the fidelity of implementing AVB approach has been maintained, I will be present at school two days a week for supervision and consultation.

Conclusion
I have raised some of the ethical difficulties that might arise from my proposed study and mentioned ways to minimize harm to any participant of the study. Your comments are most appreciated.

Chafica Gharbieh
May 2003

References:

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- Lovaas, O.I., *Behavioral treatment and normal educational and intellectual in young autistic children*. Journal of consulting and clinical psychology, 55,3-9, 1987
- Bell*, Doing your research project*. Milton Keynes: Open University Press, 1991.

Appendix N

The Autistic Centre

All Programme sheet

STUDENT: _____

Acquisition	Maintenance	Generalization	
Items		Start	Mastered
1. Come Here		-----------------	-----------------
2. Eye Contact		-----------------	---------------
3. Tolerance		-----------------	---------------
4. Non Verbal Imitation Gross Motor		-----------------	---------------
5. Non Verbal Imitation Fine Motor		-----------------	---------------
6. Non Verbal Imitation with Objects		-----------------	---------------
7. Non Verbal Imitation Oral Motor		-----------------	---------------
8. Matching		-----------------	---------------
9. Play Skills		-----------------	---------------
10. Receptive Command		-----------------	---------------
11. Receptive Labels		-----------------	---------------
12. Intraverbals		-----------------	---------------
13. Writing		-----------------	---------------
14. Self Help skills		-----------------	---------------

Appendix O

The Autistic Centre

<u>Probe Daily Data Sheet</u>

Acquisition   **Maintenance**   **Generalization**

Student: _____   Drill: _____   Data log

SD: R.		Initials: Date:
C I NR P	Comments:	

SD: R.		Initials: Date:
C I NR P	Comments:	

SD: R.		Initials: Date:
C I NR P	Comments:	

SD: R.		Initials: Date:
C I NR P	Comments:	

SD: R.		Initials: Date:
C I NR P	Comments:	

SD: Discriminative Stimulus (Instructions).   R: Response
C: Correct Response   I: Incorrect Response NR: No Response   P: Prompted Response

Appendix P

Periodical Assessment

Name: Hassan	**Term:** 1st Term
Class: Spring Class	**Language:** English

Please refer to the child IEP for more description of the items below:

A: COOPERATION AND REINFORCER EFFECTIVENESS:

Mastered all programs

B: VISUAL PERFORMANCE:

1. B1: 70% mastered
2. B2: 70% mastered (6 or more pieces).
3. B3: 60% mastered.
4. B4: 70% mastered
5. B5: 60% mastered.
6. B7: 60% mastered (6 or more pieces).
7. B8-B10: 70% mastered.
8. B11: 80% mastered (8 pieces).
9. B12: 70-80% mastered.
10. B13: 75% mastered (6 pieces);
11. B21: 50% mastered.

C: RECEPTIVE LANGUAGE:

12. C1: 50% mastered.
13. C2: 95% mastered.
14. C3: 80-90% mastered.
15. C4: 100% mastered.

16. C5: 60% mastered
17. C6: 50% mastered.
18. C7: 70% mastered.
19. C8: Still in acquisition (touch head).
20. C9: 70% mastered (touch shirt).
21. C10: 60% mastered.

D: IMITATION:

22. D1- D13: 70% mastered

E: VOCAL IMITATION:

23. E1-E5: 70% mastered.

F: REQUESTS:

24. F1-F5: 80% mastered (chips-ball); 70-80% mastered (Mankousheh-Nescafe); 60% mastered (rice-juice).

G. LABELING:

25. G1: 65% mastered (juice-ball-chocolate)

H. INTRAVERBAL:

26. H1: 70% mastered (e, i, e, i, o) from the song Old Macdonald.
27. H22: 60% mastered.

I: SPONTANEOUS VOCALIZATIONS

28. I1- I2: 80% mastered.
29. I3: 90% mastered.
30. I4: 100% mastered (twinkle-twinkle); Still in acquisition (Old Macdonald).

J. SYNTAX AND GRAMMAR:

N/A

K: PLAY AND LEISURE:

31. K1-K5: 80% mastered.

L: SOCIAL INTERACTION:

      32. L1-L4: 65% mastered.

      33. L5-L9: 70% mastered.

      34. L10-L15: 60% mastered.

M: GROUP INSTRUCTIONS:

      35. M1: 50% mastered.

      36. M3: 60% mastered.

      37. M4:65% mastered.

N. CLASSROOM ROUTINE:

      38. N1-N4: 70% mastered.

P: GENERALIZE RESPONDING:

      39. P5: 80% mastered.

Q. READING SKILLS:

      N/A

R. MATH SKILLS:

      N/A

S. WRITING:

      40. S1: 75% mastered.

      41. S2: 65% mastered.

      42. S: 60% mastered.

      43. S4: 70% mastered.

T. SPELLING

      N/A

U. Dressing:

      44. U1-U4: 60% mastered.

      45. U5- U7: 60% mastered (put off);

          still in acquisition (put on).

V: EATING:

      46. V1-V4: 80% mastered.

W. GROOMING	
	47. W1-W2: 70% mastered.
	48. W3: 70% mastered.
	49. W4: 80% mastered.
	50. W5: 70-80% mastered (combing hair).
	51. W6: 70% mastered (brushing teeth).

X: TOILETING:	
	52. X1: 70% mastered.

Y: GROSS MOTOR:	
	53. Y1-Y9: 70% mastered.

Z: FINE MOTOR:	
	54. Z1-Z5: 60% mastered.
	55. Z23-Z26: 60-70% mastered.

Remarks:

Hassan is responding well to instructions and he is enjoying the company of his peers, he is taking turns and sharing toys with is friends.

Parent's involvement, is highly recommended.

Teacher

xxxxxx

Appendix Q

Sample of "The ABLLS" Final Assessment
Advanced Learner

Name: Alex
Age: 11 years
Date of the assessment: June 2006
Assessors: Mrs. Chafica Gharbieh & Team (teachers)

General Notes:
While the majority of Alex's programs are structured to accommodate his lack of verbal skills we have been targeting his ability to initiate request using Mand's procedures associated with verbal behaviour approach (McGreevy, Sundberg and Partington 1998). His manding ability (requesting things spontaneously) has improved greatly this year.

Alex can imitate or echo words but he has some difficulties with consonant blends and clusters.

Alex's behaviour has improved a lot as we are using the "Chain of Instructions" to help him to deal with changes of situations, for example, when he mands for McDonald we give him a set of instructions such as we are going to the shop to buy a bus ticket then bus- bank – doctor – chemist – shopping then McDonald and the instructions varies according to situations.

Alex can now enjoy being around children seeking their attention, sharing toys and following their leads to join in a game. Currently Alex is able to request a game to play with the children.

We have adapted a fast paced mode of delivering the therapy: The use of errorless teaching and the variable ratio, mixing and varying instructional demands intersperse easy and hard demands, and fluency. This delivery allowed Alex to use Mand's (requesting things spontaneously); he is using 2 to 3 words sentences to communicate his needs for food drink and going to the loo. Alex is responding well to this type of format.

Alex is able to ride a bike with training wheels, and he is learning to share with other children. Alex enjoys working on his computer where he can do spelling, filling the missing letters and more.

Working on desensitizing program (sensory) for the past few months, helped Alex tremendously with this his fine motor. Alex is now able to snip with scissors and cut papers. It used to be a big problem before. The same procedures were used to desensitize the hair cutting; he can now sit comfortably to have a hair cut where it used to be a major problem before.

Engaging Alex in NET with many children allowed him to sit in a group and attend to the teacher (therapist) for 15 minutes (Section M Group Instruction) and do many things which involves tasks that will help him to follow classroom routines such as getting and returning own materials, sitting appropriately during transitions etc.. (Please see the section N Classroom Routine).

The following assessment will be provided to determine the priorities for Alex's educational program:

1. **The ABLLS (The Assessment of Basic Language and Learning Skills).**

2. Skills Tracking System: diagram for the results of Alex's performance pre & post AVB. Previous acquired skills are coloured with RED (pre AVB), while the new mastered skills are coloured with **BLUE (post AVB)** **(See Appendix R)**

The Assessment of Basic Language and Learning Skills

The ABLLS

The ABLLS is an assessment, curriculum guide and skills tracking system for children with language delays. It contains a task analysis of the many skills necessary to communicate successfully and to learn from everyday experiences.

Assessment of skills:

The ABLLS was used to determine Alex's skills in each of the 25 area of the assessment. A description of his skills will be presented (see diagrams for the results of his performance presented on the skills tracking grids for each of the skill areas), followed by an analysis of those skills to determine the priorities for his educational program. Additionally, a review of the rationale for the selection of recommended specific learning objectives for Alex will be provided.

Basic learner skills section:

Cooperation and Reinforcer Effectiveness

When offered a known reinforcing item or activities Alex will take/use the item or activity. And he is able to take a Reinforcer from two choices of items, to look at a non-reinforcing item, to take a common object when offered, (A1-A4=max). He responds to instructor controlled reinforcers (A5=max). Alex will work for a variety of items and activities as reinforcement (A6=max). Alex will work for intermittent reinforcement (occasionally delivered reinforcement) (A7=max). Alex responds to social reinforcers (A8=max). Alex will seek approval for work which he has done well or completed. (A9=max). Alex will work for 10 minutes with only praise as the Reinforcer (A10=max). Alex waits appropriately if Reinforcer delivery is delayed (A11=max).

Visual Performance

Alex will match identical objects to sample, match identical picture to sample (B1-B2=max). Alex will match pictures to objects, match objects to pictures (B3-B4=max). Alex will sort non-identical items into the appropriate categories, Alex can do block designs on a picture card i.e. 6 or more pieces (B5-B6=max). Alex can quickly complete designs with 6 or more pieces and some extra (B7=max). He can match a pattern of visual stimuli: when given a visual sequence pattern consisting of items (e.g. coloured blocks) Alex will arrange items to match the pattern (B8=max). Alex can put pieces in a form box or shape sorter, do puzzle with a single-piece type of inset, do puzzles with multiple connecting pieces in an inset type frame, and do puzzles with a square –edged border frame. Alex will do puzzles with multiple pieces, which must be juxtaposed (i.e. place together no interlocking puzzles); Alex will do jigsaw puzzles (i.e. interlocking pieces without a frame) (B9-B14=max). Alex can replicate a sequence of items after having shown him a model of items (B15=max). "Delayed finding a sample" after showing Alex a picture of a cat and hiding it then presenting him with a dog cat and bird he can find the cat without prompts (B16 = 3). Alex is able to extend a sequence pattern (coloured blocks) up to 3 items in a regular sequence (B17=max). He can replicate two objects using at least 6 blocks or other items (B18=max). Alex will arrange items in a logical order (i.e. by size, quantity, order ABC's, 123, s), Alex is able to arrange set of picture cards in the appropriate sequence. (B19=max). He can arrange at least five set of picture cards in the appropriate sequence (B20 = 3). Alex can draw a line for a maze, which has only 3 choice points for selecting the correct path (B21=max).

Receptive Language

Alex responds to his own name (C1=max). Alex can follow instruction to do an enjoyable action in context (C2=max). Alex can follow instruction to look at reinforcing and common item, Alex can follow instructions to touch a reinforcing /common item in various positions (C3-C6=max). Alex will follow instruction to do an enjoyable action out of context; he can follow instructions in routine situations (C7-C8=max). Alex can follow instructions to give a named non-reinforcing object, he can follow instruction to touch item vs. a distracter, he can

follow instructions to select one reinforcing item from an array of two objects, he can follow instructions to select one of two reinforcing items (C9-C13=max). Alex can follow instructions to select one of two common objects; he can select one of two pictures of common items (C14-C15=max). Alex is able to select specified objects and pictures when provided with a variety of instructions to select those items (C16=max). Alex can touch own body parts (C17=max). He is able to follow directions to point to body parts of other people or pictures he recognises at least 10 parts. (C18=max). Alex is able to touch own pieces of clothing (C19=max). Alex is able to select at least 10 objects or pictures by function, feature or class (C20-C21=max). Alex is able to select at least 5 objects or pictures of items when told the class to which the item belongs e.g. give an animal (C22=max).

Alex can receptively identifies 250 or more objects/pictures and identify several different examples of most of those objects/pictures (C23-C24=max). Alex can select two object/pictures from a larger set (C25&C26=max). Alex can go to at least four people upon request (C27=max). Alex can go to at least 3 people or 2 places without a prompt and he can go to at least 3 people or places to get a named item or to perform an action (C28-C31=max). Alex can receptively identify over 15 actions, either by demonstrating the action (C32&C33=max) or by selecting pictures representing the actions (C34=max). Alex is able to locate objects in larger complex picture (C37=max). Alex is able to locate objects (at least 3 of 4 items) when only shown parts of the objects within a larger, complex picture (C38 = max). Alex can choose appropriate pictures when the sound which is paired with that item, is heard (C39 = max). Alex is able to select between two similar items that vary on one dimension (i.e. adjectives), he can also select set of items with a specified characteristic (C40&42=max). He can select a specified item which has the two specified characteristics: e.g. the big red ball (C41= max).Alex is able select set of 10 items with two specified characteristics (C43=max). Alex is able to select associated pictures and he can follow a multiple component sequence instructions. Alex will identify receptively at least 6 prepositions (C44-C46 maximum scores). Alex is able to follow instructions, which include selections involving pronouns for at least 3 pronouns (C48 = max).Alex can select few pictures representing a location or an activity presented in a scene (C50=1). Alex can select 4 pictures representing emotions and social interactions (C51&C52 =max).

Imitation
Alex can imitate most simple gross motors and fine motor actions (D1-D10 = maximum scores). Alex can imitates the actions of others for at least10 actions (D12= max). Alex has difficulty to imitate actions, which he observed several hours earlier in the day, however, he can imitate the action after 1hour of observing it (D13=3).

Vocal Imitation

Alex can imitate almost any sound/word on request (E1-E2=max, E4=3). Alex will imitate at least 5 words with consonant blends (E3=2). Alex will imitate words or simple phrases on request (E4&E5=3).Alex will spontaneously imitate words with varying intonation (E6-E7=max, E8=3) but he has some difficulty to spontaneously imitate phrases (E9=2).

Requests

Alex can and do request a variety of desires items and activities throughout the day including items that are not currently within sight (F1-F6=max). Alex is able to requests attention (at least 15 requests per day) by tapping on our shoulder or by calling us and then manding for things (F7=max). Alex is able to request (at least 10 or more) missing items needed to complete a task, he can requests sometimes with head movements or by saying yes or no (F8 & F9 =max). Alex can asks for help when needing assistance (F11 =max) However, he asks for simple questions to obtain information using WH questions (F13 – F15=1). He requests future items or events(F21&f22=1) He is readily able to learn new requests for objects, actions after being required to request those items less thank five times (F24, F26 = 1). Alex can spontaneously request objects or actions at least 20 times per day (F27 =max).

Labelling

Alex can label over 250 items and over 10 actions (G1- G6=max), he acquires novel labels without intensive training (G7, G8=1). He is able to label body parts on himself and others and he is can label parts or features of objects (G9&G10 = max). Alex is able to label adjectives (at least 10 adjectives) (G11=max) He is able to label at least 25 items when only told the function (G12=max), at least 10 items when told the feature (G13=3) and at least 5 items from 4 class when told the class of the items (G14=max). Alex can label function of an item, class of an object G15 &G16 = 3). Alex can label the class of a set of items (G17 =max). Alex can label the class of an object or labels features of items, which are missing or incorrect (G18&G19=1). Alex can identify that a particular item does not bong with a certain set of items and he can identify two or more objects presented together (G20&G22=max; G23= 3; G25=1).Alex can identify and label emotions which are not directly observable by others e.g. in pain, itches, sleepy (G40=2). Alex will label items, emotions or actions during the day (at least 20 times) without being asked to label those items or actions (G39=3; G40=2; G42=2).

Intraverbals

Alex can name over 250 items and can label some actions. He will fill in words from 6 songs (H1& H2=max), and will sign 5 signs (H3=2), and knows more than 8 sounds of animals (H4=3). He can give his full name and age when asked (H5=max). Alex can fill in the function, features, class of items (at least 10 fill in) (H7-H11= max). Alex can fill in the remaining word of a phrase to specify the class of a given item 20 or more fill in (H12 = max). He can provide members of a specified category such as naming some animals and stating class given multiple

class members (H13=3; H14=2) Alex is able to answer how, where what etc. questions (H16=2, H17&H19=1). Alex will answer which questions and few when questions (H20=max, H21=1)). Alex can answer yes or no or move his head to answer questions about non-present items for at least 5 questions (H28=1).

Spontaneous Vocalisations

Alex will spontaneously say approximation to at least 10 words per hour (I1=max; I2&I3=3) he will sing 2 phrase from each of 5 songs (I4-= max). Alex will spontaneously sing songs without models at least 2 phrases from each of 5 songs (I5=max). He is able to request at least 20 items per day (I6&I8=max). Alex is able to spontaneously label items and actions at least 20 times per week but he is unable to label events or to make a spontaneous conversation (I9=0).

Syntax and Grammar

Alex did score 0 on all the items (J7-J20=0).

Play/Leisure Skills

Alex will explore toys in the environment and he picks up or manipulates at least 2 toys as they where designed in ten-minute period (K1 - K3=max). He will talk while playing by himself and engaging in 5 verbal responses (K4=max). He allows other children to be near him when playing with a toy and accepts toys from them, and he gives other children toys when they request them (K5=max). While playing with peers Alex engages in two verbal response (K6=3). He is able to pretend to be somebody (K7=max). He is able to engage in appropriate independent indoor activities for at least 3 activities for 15 minute (K8=max) Alex is able to engage in appropriate interactive leisure activities for at least 2 activities for 1 minutes (K9=max). Alex enjoys outdoor activities (K10=max).

Social Interaction Skills

Alex will engage in appropriate physical interaction behaviour when near peers but he requires lots of prompts, he cans tolerates/responds sometimes to positive touches by peers (L1 & L2=max). Alex is appropriate for 15 minutes when near peers and siblings (L13=max).He will follow simple directions from adults using some prompts and he can take an item when offered (L5=max) when carefully approached Alex goes along with interactions initiated by some peers, in some situations, Alex is able to attend and imitate the physical, verbal behaviour of peers e.g. makes hand movements while singing or listening to a song (L4, L6, L7= max). Alex will accept offers from others to join an activity (L8=max). Alex can make appropriate eye contact when interacting with others (L9=max). Alex can return greeting from peers and look at others to start a social interaction, but he sometimes needs indirect prompts. Initiate greetings or ask for information and items, or labels items for others (L10=max; L11= 1) however; he can physically approaches and engages others (often makes a single attempt when prompted). He can share items when prompted (L12=max; L16 –L17=max; L13,

L14=3). Alex will offer to share items when prompted, he sometimes maintains attention of others (L18-L21=2; L23=3).

Group Instruction

(M1&M2=max) Alex can sit for 15 minutes without engaging in disruptive behaviour during small and large groups. Alex can attend to the teacher (therapist) during small group instruction (1:2 groups) for 75% of time and follow directions given by teacher and children (M3&M4=3). Alex follows group instructions 1:3 group for 75% of time, all students do the same receptive response (M6=3).) Alex takes turns during instruction 75% without prompts; he acquires some new skills with repetitive exposure to the material in a group teaching format. (M11&M12=1)

Follow Classroom Routine

Alex is n able to follow all classroom routines such as line up on request, completes a task and brings work to teacher, or works independently on academic activities, he can be redirected from one activities to another he is able to get or return own materials without a prompt, (N1=1, N2, N3, N6, N7, N8 =max)). He can work independently on academic and non academic activities, (N4, N5=3). He can wait for his turn to do activities and will follow daily routine (hang up coat etc.) without prompts (N9&N10=max).

Generalized Responding

The skills that Alex acquires readily generalize to novel stimuli (P1=max) and he uses his skills with a variety of individuals (P2=max) in all environments (P3=max). Alex spontaneously uses acquired skills under group situations. Such as he learns to label "cup" in individualized teaching session and can then label "cup" while participating in a small group (P4= max). Alex uses his skills as they were taught and does not spontaneously vary his responding (P5&P6=1).

Academic Skills Section

Reading

Alex can both receptively identify and label the letters of the alphabet (Q1&Q2=max). He can identify the sounds of at least 20 letters (Q3=max), but he can label the sounds of letters when shown those letters (Q4=max). Alex can match words with pictures, match words to words and names letters in words reading left to right (Q5-Q7=max). He can match individual letters to letters on word cards and he can fill in missing letter of words when given a picture of an object and two of three for the word provided (Q8 &Q9=max). Alex can read at least 100 simple words (Q10&Q11=max) and can read simple sentences; he can select the appropriate word from an array of 2 words to fill in the missing word, Alex is able to read simple sentences (3-6 words) containing combinations of known words. (Q12, Q13& Q14 = max.).

Math

Alex is able to label, count and identify to any specified number up to 100. He can count objects with prompts up to number 100. Alex is able to match words to numbers from 1 to 10 Alex is able to name numerals in sequence (R1- R8= maximum scores). He can physically add items to make total set of up to 10 items (R9= max). Alex is able to receptively identify examples of the word same (R15= max).

Writing

Alex is able to mark on paper when a crayon and paper are given to him (S1=max) he can colour between lines with a prompt (S2=1) he is able to trace lines, shapes letters and numbers (S3=max) he is able to copy straight and curve lines; he can print and copy at least 20 numbers and 20 letters without models (S4=max; S5, S6, S7=3; S8=max)). He is able to print numbers without models (S9=3).

Spelling

Alex is able to match individual letters to letters on word card (T1=max) he is able to fill in missing letter of words (T2=max) however he can copy 3 letter words, he can write in the missing letter of word (T3&=1; T4=max)). Alex is able to spell more than 10 words (T5=3). Alex writes dictated words (T6=3).Alex can spell and fill in missing letters working on his computer up to 50 words.

Self Help Skills Section

Dressing Skills

Alex can pull up and down his trousers, and he can put on or remove his socks coat, shirt (U1-U3, U5, U6, U7=max) Alex can either remove or put on buttoning shirts (U4=1). He can unzip and fasten zippers (U9, U10, U11= max) but he is able to fasten large buttons and undo small buttons (U12 =3) Alex can fasten and unfasten snaps on an article of clothing, he can adjust clothing when needed (U13, U14, U15=max).

Eating Skills

Alex is able to eat food using fingers, he uses utensils to eat and he drinks from cup, straw and takes prepared lunch to table (V1 –V6=max) he is able to cut food with a knife or cleaning up table after meals without prompts (V7=1). He takes prepared lunch to table and he keeps eating areas clean (V8-V10 = max).

Grooming

Alex is able to wash/dry his hands and face independently (W1-W4=max). He brushes hair, his teeth independently (W5&W6= max).He requires prompts to use a tissue to blow his nose (W7=1).

Toileting

Alex is now toilet trained (X1-X4=max) Alex can wipe himself after urinating (X5=max), he does not need assistance to clean himself. (X8-X10=max). Alex is able to independently use a familiar restroom for bowel movements (X9=max).

Motor Skills Section

Gross Motor Skills

Alex can creep on stomach, kneel, walk forward/backward, walk and roll sideways, and can run smoothly and hop on two feet, skip (Y1-Y11=max). He can jump forward and jump down and balance on one foot, he is able to kick, throw, catch or roll a ball. (Y12-Y22=max). Alex is able to ride a tricycle, micro-scooter, climb a ladder, hang from bar (Y23-Y28=max). Alex can ride a bicycle.

Fine Motor

Alex can do a variety of fine motor skills such as multiple puzzle pieces into a frame (Z1-Z4=max), stack blocks (Z5&Z6=max), he has the strength of pincer grasp and ability to release grasp after positioning, he can also string beads (Z7-Z10=max) he is able to remove or replace lid of jars (Z11-Z13=max) he can open "zip lock" type bags (Z14=max). Alex can snip paper with scissors. (Z15=max). He uses pincer grip (Z16=max) and mark on paper with a crayon (Z17=max) Alex is able to cut across paper with scissors, copy shapes letters and patterns (Z18-Z21=max). Alex can paste shapes on plain paper picture, he can fold a piece of paper (Z23, Z24, Z27=Max).

Sample of "The ABLLS" Final Assessment
Early Learner

Name: Karl
Age: 5 years
Date of the assessment: June 2006
Assessors: Mrs. Chafica Gharbieh & Team (teachers)

General Notes:
The behavioural input Karl has received at school has clearly established good levels of compliance. Karl's behaviour has improved and he has become a well behaved child who can easily follow instructions and daily routine of the school.

While the majority of Karl's programs are structured to accommodate his lack of verbal skills we have been targeting his ability to initiate request using Mand's procedures associated with verbal behaviour approach.

We have adapted a fast paced mode of delivering the therapy: The use of errorless teaching and the variable ratio, mixing and varying instructional demands, intersperse easy and hard demands, and fluency. This delivery allowed Karl to use Mand's (requesting things spontaneously using gestures and pointing).

As for the social skills, Karl's improvement was noticeable in showing interest in others and sharing enjoyment with his peers. Such as greeting them with smiles and hugging them.

Karl's pre-academic skills have improved tremendously, he is more alert and attentive and he can follow instructions and attend to the teachers in group 1:5 for 75% of time. He will work independently on academic and non-academic activities for up to 10 minutes. He can work for 30 minutes for only praise which serves as an effective reinforcer for him. He mastered interlocking puzzles up to 16-20 pieces without prompts and he can do block designs on a card and he can replicate a model using blocks. Now he can draw a line in a maze without prompts.

Karl can easily follow class room routines; he is more co-operative and can take turns and wait for his turns and allowing his friends to share items which he is using.

Karl has difficulties with the verbal skills and the auditory processing of the language. However, he is vocalising a lot more by making some sounds and few

words such as nana for bananas and "AHH" for apple and "AEI" for Ali and tata mama etc... Karl is spontaneously manding/requesting reinforcing items using the initial sounds of the words.

Karl can be easily encouraged to do or try new things. He can be easily redirected to climb the ladder and try using the new sensory equipment.

The following assessment will be provided to determine the priorities for Karl's educational program:

The ABLLS:
    1. Assessment and analysis of the skills.
    2. Skills Tracking System (diagram for the results of Karl's performance) pre & post AVB. Previous acquired skills are coloured with RED (pre AVB), while the new mastered skills are coloured with **BLUE (post AVB)** **(See Appendix R)**

The Assessment of Basic Language and Learning Skills

The ABLLS

The ABLLS is an assessment, curriculum guide and skills tracking system for children with language delays. It contains a task analysis of the many skills necessary to communicate successfully and to learn from everyday experiences.

Assessment of skills:
The ABLLS was used to determine Karl's skills in each of the 25 area of the assessment. A description of his skills will be presented (see diagrams for the results of his performance presented on the skills tracking grids for each of the skill areas), followed by an analysis of those skills to determine the priorities for his educational program. Additionally, a review of the rationale for the selection of recommended specific learning objectives for Karl will be provided.

Basic learner skills section
The basic learner skills section of The ABLLS provides a curriculum that emphasise skills that are important for being able to "learn to learn". Therefore, the majority of instructional time should be devoted to the development of these critical skills in order to learn from everyday experience.

Cooperation and Reinforcer Effectiveness

When offered a known reinforcing item or activities Karl will take/use the item or activity. And he is able to take a Reinforcer from two choices of items, to look at a non-reinforcing item, to take a common object when offered, (A1-A4=max). He responds to instructor controlled reinforcers (A5=max). Karl will work for a variety of items and activities as reinforcement (A6=max). Karl will work for intermittent reinforcement (occasionally delivered reinforcement) (A7=max). Karl responds to social reinforcers. He works for 30 minutes for only praises (A8=4). Karl will sometimes look to see if others have noticed what he has done (A9=1). Karl will work independently for 10 minutes to complete task for recognition of task completion (A10=max). Karl waits appropriately if Reinforcer delivery is delayed (A11=max).

Visual Performance

Karl will match identical objects to sample, match identical picture to sample (B1-B2=max).Karl will match pictures to objects, match objects to pictures (B3-B4=max). Karl will sort non-identical items into the appropriate categories (B5=max). He will do block designs on a picture card and from picture, using 4 blocks or extra (B6&B7=3). He can match a pattern of visual stimuli i.e. 8 pieces of 4 items with no extras (B8=3). Karl can put pieces in a form box or shape sorter, do puzzle with a single-piece type of inset, do puzzles with multiple connecting pieces in an inset type frame, and do puzzles with a square –edged border frame. Karl will do puzzles with multiple pieces, which must be juxtaposed (i.e. place together no interlocking puzzles); Karl will do jigsaw puzzles up-to 16 pieces (i.e. interlocking pieces without a frame) (B9-B14=max). Karl will extend a sequence pattern i.e. 3 items in a regular sequence (B17=2). When shown a model, Karl builds a simple house using 3 blocks or other items (B18=1). Karl is able to draw a line from the start to the end of simple maze which has only 1 choice point for selecting the correct path (B21=1).

Receptive Language

Karl responds to his own name (C1=2). Karl can follow instruction to do an enjoyable action in context (C2=max). Karl can follow instruction to look at reinforcing and common item, Karl can follow instructions to touch a reinforcing item in various positions (C3-C5=max). He will follow instructions to touch common items if it is held in front of him (C6=1) Karl will follow instruction to do an enjoyable action out of context; he can follow instructions in routine situations at least 3 activities with only partial prompts (C7-C8=3). Karl can follow instructions to give a named non-reinforcing object, he can follow instruction to touch item vs. a distracter, he can follow instructions to select one reinforcing item from an array of two objects, he can follow instructions to select one of two reinforcing items (C9, C11-C14=2). He will follow instructions to do a simple motor action at least 5 without prompts (C10= max). Karl will select one of two pictures of common items (C15=1). Karl is able to select objects using 2 instructions (C16=1). Karl can follow instructions to go to a least 2 persons and follow instructions to give/get an item with partial prompts (C27-C29=1).

Imitation

Upon request Karl will imitate a motor activity with an object, he will imitate Gross motor movement when given the instructions "Do this" (D1-D3=max). Karl can imitate a gross motor activity involving foot and leg movements, arm and hand movements (D4-D5=4). Upon request Karl can imitate a gross motor activity involving head movements (4 actions). (D6= max). Karl can imitate a motor activity involving mouth and tongue movements and can imitate some of fine motor activity matching the speed of an action (D7-D9=1). Karl can imitate 2 sequence of 2 actions (D10=1). Karl can imitate 2 gross motor actions of others without direct verbal prompt (D11=1). He sometimes watches others and does what others do (D12=1).

Vocal Imitation

Karl can imitate sounds /initial sounds or words upon request (E1-E2=3)

Requests

Karl is able to specifically indicate items and activities which he wants by pointing to, pulling to, or standing by the particular items or activities without using words or sign language. (F1=max). Karl will ask for what he wants when the reinforcer is present and a word or sign is given (4 items initial sound) (F2&F3=2). He spontaneously requests at least 2 items or activities items may be present (F5=1). Karl will as others to perform 2 specified actions (F6=1). Karl will request help using gestures in only 1 or 2 specific situation e.g. open container (F11=1).

Labelling

Karl will label reinforcing items using the initial (4 labels) (G1=2). Karl will receptively label 2 people (G3=1).

Intraverbals

Karl will fill one word for a song (H1=1).

Spontaneous Vocalizations

Karl can babble speech sounds totalling at least 5 minutes per hour. (I1=2). He spontaneously says approximations to words an average of at least 5 words per day (I2=1). Karl will sing 1 word from 1 song (I4=1). He will spontaneously use vocal imitation at least 5 times per week (I6=1).

Syntax and Grammar

Karl did score 0 on all the items.

Play/Leisure Skills

Karl will explore toys in the environment and he picks up or manipulates at least 2 toys as they where designed in ten-minute period (K1 & K2=max).He spontaneously does at least 5 activities with 5 toys (K3=max). He will play interactively with other students and give them toys when they request them (K5=3). He is able to engage in

appropriate independent indoor activities for at least 3 activities for 10 minute (K8=3). Karl is able to engage in appropriate interactive 3 leisure activities for 10 minutes (K9=3). He is able to engage in appropriate outdoor games and activities 3 activities for 5 minutes (K10=3).

Social Interaction Skills

Karl will engage in appropriate physical interaction behaviour when near peers, he can tolerate/respond appropriately to positive touches by others (L1 & L2=max). Karl shows an interest in the behaviour of peers and responds to approaches & attempts to interact from peers (L3-L5=2). Karl can attend to the behaviour of peers and imitates simple movements with them. He will follow simple directions from adults using some prompts and he can take an item when offered from both peers and adults and maintain good eye contact (L6 –L9= max). He will returns greetings "HI" but often requires an indirect verbal prompt (10=1). Karl will look at others in such a manner as to initiate a social interaction with peers and adults, he can physically approach and engage others (L12&L13=max). Karl will often approach and attempt or prompt others to do a specific activity (L14=4). Karl will allow others to use items which he is using usually without prompts (L17=2).

Group Instruction

Karl will sit appropriately in small group 1:4 group for at least 30 minute and sit appropriately in large group 1:6 group for 15 minute (M1&M2=max). He can attend to teacher in a group teaching situation 1:4 group 75% of time (M3=4). Karl can attend to other students in group1:2 fro 75% of time (M4=2). Karl will follow group instructions all do the same receptive response. (1:2 group for 75% of known instructions (M6=2). He takes turns during instructions 75% with prompts (M11=1).

Follow Classroom Routine

Karl is able to follow some classroom routines such as line up on request, completes a task and brings work to teacher; he will physically transition to next area of activity, 50 % of instructions without prompts. He works independently on academic activities up to 10 minutes, he will sit and wait appropriately during transitions for up to 2 minutes, he can wait turns to do activities such s washing hands, etc... (N1, N3, N6=1; N5, N7, N9=2). He is able to get or return own materials without a prompt (N2=max) he can work independently on non academic activities, he can be redirected from one activities to another (N4=3; N8=2). He can wait turns to do activities and will follow daily routine (hang up coat etc.) without prompts (N9&N10=2).

p. Generalized Responding

The skills that Karl acquires readily generalize to novel stimuli (P1=max) and he uses his skills with a variety of individuals (P2=max). he generalises across environments (P3=2). Karl is able to use skills acquired in individual teaching session when in group situations with peers (P4=2).

Academic Skills Section

The Academic Skills Section should not be of a higher priority than those in the Basic Learner Skills Section. Unless the child has made considerable progress in most of the areas of the Basic Learner Skills Section, or unless he already has easily learned some or has an interest in numbers, letters, etc... These types of skill should be deferred to a later time.

Q. Reading

Karl can match individual letters to letters on word card (Q8=max). Karl did struggle a lot on this program it was put on hold and re-introduced many times later. He seems to suffer from auditory processing problems. As he can successfully match the letters or give the correct letter when shown a similar flash card of it.

R. Math

Karl did score 0 on all the items however; he can match Numbers to Numbers using 3D and 2D. Karl will receptively label no. 1 and no. 2 only.

S. Writing

Karl is able to Karl on paper when a crayon and paper are given to him (S1=max) he can colour between lines with a prompt (S2=1) he is able approximately to trace straight and curved lines, (S3=2) he is able to roughly copy straight and curved lines with minimal prompts (S4-S5=2).

T. Spelling

Karl is able to match individual letters to letters on a word card (T1=1). He scored 0 on the rest of the items.

Self Help Skills

Self Help Skills are a part of everyday activities and are important skills to acquire. Therefore, the child's skills can be carefully shaped in the process of his participation in those activities. Many of the skills identified in the Basic Learner Skills Section can be developed in conjunction with the teaching of the self-help skills.

U. Dressing Skills

Karl can pull up and down his trousers, and he can remove his socks, remove his coat, however, he can unzip/ fasten zippers. Independently (U1, U5-U7=1; U9& U10=2). Karl will close a zipper which is started on an article of clothing (U11=1). He can undo and fasten snaps on clothing without assistance, he can use buckles (U13&U14=2).He can adjust clothing when needed with some prompts (U15=1).

V. Eating Skills

Karl is able to eat food using fingers, he uses utensils to eat and he drinks from cup, straw (V1 –V4 =max) he will spread with a knife with prompts (V5=1). Karl is able to pour liquid into a cup with prompts (V6=1) and he usually takes prepared lunch to table without prompts and clean up table after meal without a prompt (V8&V9=2). He will keep eating areas clean with only verbal or gesture prompts. (V10=1).

W.Grooming

Karl is able to wash his hands without prompts and he can wash and dry face with verbal prompt (W1=2; W2-W4=1). He requires prompts to brush his hair and his teeth (W5&W6=1).

X. Toileting

Karl is not toilet trained yet. However, following the checking nappies schedules at school and at home, Karl seems to find it extremely difficult to stay dry on the schedule, he has wet nappy nearly every time we checked it which indicates a physical problems. Parents were advised to investigate this matter further and seek medical advice.

Due to our constant observation of Karl, we managed to take him to toilet where he has urinated in the toilet and had bowel movement at least 2 times. (X1 X6=1). This occurs not because he indicates that he wants to go to toilet by because our staffs were carefully monitoring Karl's face where he usually becomes red and puffy all of the sudden (pushing action which indicates bowel movement).

Motor Skills Section

As with self-help skills, there are many opportunities to incorporate the development of motor skills into many of the daily activities. The development of both fine and gross motor skills can also result in opportunities to reinforce the learner's cooperation, development imitation, and receptive language skills; following routines etc… the development of these skills can also facilitate the development of social interaction skills (basic learner skills) by helping the child to learn to engage in motor activities that involve peers.

Y. Gross Motor Skills

Karl can creep on stomach, kneel, walk forward/backward, walk and roll sideways, and can run smoothly (Y1-Y8=max). He is able to jump forward and jump down form an object (Y12-Y13=max). He is able to kick, throw, catch or roll a ball. (Y15-Y19 & Y21=max). He will climb a ladder using reciprocal motion and he can walk across a balance beam (Y25-Y26=max).

Z. Fine Motor

Karl can do a variety of fine motor skills such as multiple puzzle pieces into a frame (Z1-Z4=max), stack blocks (Z5&Z6=max), stacking rings, transfer object to the opposite hand (Z7&Z8=max), string beads (Z10=max) he is able to remove or replace lid of jars (Z11&Z12=max) he can open "zip lock" type bags, remove wrappers (Z13&Z14=max). He can snip paper with scissors (Z15=max).He uses pincer grip (Z16=max) and Karl on paper with a crayon (Z17=max). Karl can paste shapes on plain paper (Z23&Z24= max). He is able to trace lines with a finger and will turn pages of the book in an appropriate way (Z25-Z26=max).He can squeeze glue from the bottle (Z28=max).

Appendix R

The ABLLS Skills Tracking Sheets

Advanced Learner

The ABLLS Skills Tracking Sheets

Early Learner

Appendix S

Parent & Teachers Questionnaires

Coding

Each answer is assigned a point. Higher points indicate severe form of disability.

Section 1 personal details
Question (1.2): 1= 1 point;   2= 2 points;   3= 3 points;   4= 4 points;   5 = 5 points;
6 = 6 points;   7 = 7 points;   8= 8 points.

Section 2 Behaviour
Question (2.1): All yes in this section = 2 points;
All No in this section = 1 point.

Question (2.2): rarely = 1 point;   when excited= 2 points;   other= 3 points;
when under stimulated=4 points;   when frustrated=5 points.

Question (2.3): less than 1 = 1 point;   1-5= 2 points;   6-10=3 points;
11-15=4 points;   more than 15= 5 points.

Question (2.6) = Verbal =1 point;   Oral= 1;   Gross Motor=1;   Olfactory=1
point;   Tactile=1 point.

Question (2.7): rarely = 1 point;   when excited= 2 points;   other= 3 points; When
under stimulated=4 points;   when frustrated=5 points.

Question (2.8): less than 1 = 1 point;   1-5= 2 points;   6-10=3 points;
11-15=4 points;   more than 15= 5 points.

Section 3 Progress and development
Question (3.1): Yes = 2 points;   No = 1 point.
Question (3.2) to (3.19):   Regressed=4 points;   No change=2;
Significant improvement =1;   N/A=0.

Section 4 Personal View

All Yes in this section = 1 point;   All No = 3 points   All Not sure= 2 points.

Question (4.14): answer 1= 1 point; answer 2= 2 points;   answer 3= 3 points;
Answer 4= 4 points;   answer 5= 5 points.

Appendix T

The Autistic Centre

Child's Form

Date: _____

Form is completed by: _____

Child's Name: _____
Child's Blood Type: _____
Address: _____
_____
_____
_____
Tel: _____

Family's doctor: _____   **Tel:** _____
Address: _____

A. General Information

1. What is the sex of your child?
□ Male
□ Female

2. What is his/her birth dates?
Day/month/ year: _____

3. How many children do you have including the children with ASD?
□ 1
□ 2
□ 3
□ 4
□ 5
□ More than 5

4. If you have more than one child, please answer the following:

Siblings	**Gender**	**Date of birth**

Name _____   F /M   _____
Name _____   F/ M   _____
Name _____   F/ M   _____
Name _____   F/ M   _____
Name _____   F/ M   _____
Name _____   F/ M   _____

5. What is the father's name?
Name: _____

6. What is the mother's name?
Name: _____

7. What is the father's birth date**?**
Day/month/ year: _____

8. What is the mother's birth date?
Day/month/ year: _____

9. What services are available for you to access (please tick all that apply)?
□ Community services
□Financial assistance
□ Hospital-based services
□ Occupational therapy
□ Speech language therapy
□ Physical therapy
□ Special education
□ Other (Please specify) _____

B. Diagnosis

10. How old was your child when he/she was diagnosed?
(Month/year) _____

11. What diagnosis did your child receive?

□ PDD-NOS
□ Autistic disorder
□ Asperger's disorder
□ Other (Please specify) _____

12. What instruments were used to diagnose your son/daughter?

_____

_____

_____

13. If the diagnosis was based (at least in part) on clinical observation, how long was your child observe for?

□ 5 or less hours
□ 6-10 hours
□ 11-15 hours
□ 16-20 hours
□ 21 or more hours

14. Has your child's diagnosis changed since the original one?

□ Yes
□ No (Please go to question 16)

15. If yes, what is their current diagnosis?

□ PDD-NOS
□ Autistic disorder
□ Asperger's disorder
□ Other (Please specify) _____

C. Family History

16. Are there any histories of autism in your family?

□ Mother
□ Father
□ Sibling
□ Grandmother
□ Grandfather
□ First cousin
□ Second cousin
□ Aunt
□ Uncle
□ Other (Please specify) _____

17. Are there any cases of other mental disorders in your family (either immediate or extended?

□ Yes
□ No (Please go to question 19)

18. If yes please indicate the disorder, and the relationship to your child including which side of the family he/she is on:

Relative   Side of Family   Disorder

1.   □ Mother □ Father   _____
2.   □ Mother □ Father   _____
3.   □ Mother □ Father   _____
4.   □ Mother □ Father   _____

19. What is the mother's occupation?
Occupation:_____

20. What is the Father's occupation?
Occupation: _____

21. What is the house hold's average annual income?
□ less than $15.000
□ $15.000 to $25.000
□ $25.000 to $40.000
□$ 40.000 to $60.000
□ above $60.000

D. Medical History

22. Were there any complications during pregnancy or delivery of your child?
□ Yes
□ No (please go to question24)

23. If yes, what were the complications?
Complications: _____
_____
_____

24. At what week of gestation was your child born?
Week # _____

25. Please state your child's weight at birth?
Child's weight: _____

26. Has the child ever had a head/brain injury?
□ Yes
□ No (Please go to question 28)

27. If yes, what kind of injuries your child did suffer? Please give the date of injuries
Injuries: _____
_____
_____

28. Has your child ever had a surgery
□ Yes
□ No (Please go to question 30)

29. If yes, please describe:
_____
_____

30. Has your child ever suffer from seizures?
□ Yes
□ No (Please go to question 32)

31. Please state the following:
Frequency of seizures: _____Length:_____
Type (s): _____
Currently taking seizures medication: □ Yes   □ No
List
medication(s):_____

_____
Seizure medications taken previously? □ Yes   □ No
List medication (s): _____

_____
Are there any problems which place limitations on physical activity?
□ Yes   □ No
List: _____
_____

E. Health

32. Was the child nursed? □ Yes   □ No
If yes, until what age?
_____

33. Pleas describe the child's diet _____
_____

	Excessive	Daily	Weekly	Rarely	Never
Vegetables	_____	_____	_____	_____	_____
Fruits	_____	_____	_____	_____	_____
Meats	_____	_____	_____	_____	_____
Sugar	_____	_____	_____	_____	_____
Artificial sweeteners	_____	_____	_____	_____	_____
Artificial colourings	_____	_____	_____	_____	_____
Diary products	_____	_____	_____	_____	_____
Flour's products	_____	_____	_____	_____	_____

34. Please list dietary supplements and vitamins?
_____   _____   _____

_____   _____   _____
_____   _____   _____

35. Does the child suffer from food allergies?   □ Yes □ No □ Never tested
If yes, please list:

_____   _____   _____
_____   _____   _____
_____   _____   _____

Food cravings   □ Yes □ No
Picky eater   □ Yes □ No
Overeats   □ Yes □ No
Poor appetite   □ Yes □ No

36. Does the child have a history of colds or sinus congestion?
□ Yes   □ No

37. Does the child have a history of ear infections?
□ Yes   □ No
If yes, which ears have been affected?
□ Left   □ Right   □ Both
38. Does the child have hypersensitive hearing?
    □ Yes   □ No
39. Has the child had an eye examination?
    □ Yes   □ No

F. **Behaviour**

40. Does the child display any self-injurious behaviour?
    □ Yes   □ No
41. If yes, what are they and when do they occur (please indicate all that apply)?

Self-injurious behaviour	When Excited	When Frustrated	When under - stimulated	Rarely	Other (please specify)
1.					
2.					
3.					
4.					
5.					
6.					
7.					

42. How many times per day do the behaviour(s) occur?

Self injurious behaviour	Less than 1	1-5	6-10	11-15	More than 15
1.					
2.					
3.					
4.					
5.					
6.					
7.					

43. How severe are these behaviours, for example have they caused permanent physical damage?

_____
_____
_____

44. Does the child engage in self-stimulatory behaviour?
   □ Yes   □ No

45. If yes, what are the behaviours that the child engages in? (Please indicate which sensory mechanisms are being stimulated for each behaviour?

Self -stimulatory behaviour	Verbal	Oral	Gross motor	Olfactory (smell)	Tactile (feel)
1.					
2.					
3.					
4.					
5.					
6.					
7.					

46. When does the behaviour (s) occur? (Please as many that applies).

Self -stimulatory behaviour	When excited	When frustrated	When under stimulated	Rarely	Others (please specify)
1.					
2.					
3.					
4.					
5.					

6.					
7.					

47. How many times per day does the behaviour (s) occur?

Self -stimulatory behaviour	Less than 1	1-5	6-10	11-15	More than 15
1.					
2.					
3.					
4.					
5.					
6.					
7.					

48. What kind of communication does the child use?

  □ Verbal
  □Sign
  □PECS
  □ Other (please specify): _____

49. Does the child have any sleep disorders?
  □Yes   □ No
50. If yes, what kinds of sleep problems does the child display?
  □ Irregular sleeping patterns
  □ Night fright
  □ Awakenings
  □Apnea
  □Other (please specify): _____

51. Has the child undergone a neurological exam? (MRI, CAT etc...)
  □ Yes   □ NO
52. If yes, at what age was the test taken, and what were the results?

  □ Age: _____
  □ Results: _____

53. Has the child undergone an IQ assessment?
  □Yes   □ No
54. If yes, at what age, and what were the results?
  □ Age: _____
  □ Results: _____

55. In your opinion what is the most salient feature of the Autistic Spectrum Disorder in your child? (please select the one that best applies)

   □ Echolalia
   □ Self-stimulatory behaviours
   □ Self-injurious behaviours
   □ Fixations
   □ Rigidity
   □ Lack of social skills
   □ Temper Tantrum
   □ Other (please specify): _____

G. **Treatment**

56. Has the child undergone any type of treatment for ASD?

   □ Yes   □ No

57. If yes, please complete the following chart indicating what treatment(s) is the child receiving and when it started/stopped?

Treatment	Start date	End date
1.		
2.		
3.		
4.		
5.		
6.		
7.		

58. If you are using ABA (Applied Behaviour Analysis) program, how many hours per week does the child receive?

   □ Under 10
   □ 10 – 15 hrs
   □ 15 – 25
   □ 26 – 30
   □ 31 – 35
   □ Over 35

59. Have you noticed any behavioural or physical changes in your child whom you can attribute to the ABA program?

   □ Yes   □ No

60. If yes, what areas of functions have been improved?

   _____
   _____
   _____

61. Is your child on any medication?
    □ Yes   □ No
62. If yes, what is it?
    Drug:_____

    _____

63. Have you noticed any behavioural or physical changes in your child that you
    attribute to the medication?
    □ Yes   □ No
64. What were the changes?
    Changes: _____

    _____

65. In your opinion what area of your child's functioning has been most improved
    by the treatments used?
    □ Behavioural
    □ Cognitive
    □ Attention
    □ Language
    □ Physical
    □ Social skills
    □Other (please specify): _____

66. In your opinion what area of your child's functioning has been least
    improved by the treatments used?
    □ Behavioural
    □ Cognitive
    □ Attention
    □ Language
    □ Physical
    □ Social skills
    □ Other (please specify): _____

H. Hand Preference

67. Please tick only one answer:

	Right	Mixed	Left
□ Writing	_____	_____	_____
□ Eating	_____	_____	_____
□ Throwing	_____	_____	_____
□ Brushing teeth	_____	_____	_____
□ Combing hair	_____	_____	_____
□ Other_____	_____	_____	_____
_____	_____	_____	_____

I. Language and Reading Skills

68. Please tick only one answer:

	Yes	No	Not- sure
□ Articulation problem	_____	_____	_____
□ Stammer or stutter	_____	_____	_____
□ Poor pencils grasp	_____	_____	_____
□ Sloppy writing	_____	_____	_____
□ Poor reading ability	_____	_____	_____
□ Letter reversals	_____	_____	_____
□ Right – Left confusion	_____	_____	_____
□ Poor judge of time	_____	_____	_____
□ Poorly organized	_____	_____	_____
□ Forgetful	_____	_____	_____

J. Development History

69. Please state the following:

□ Age crawled on stomach	____ years	_____ months
□ Crept on hands and knees	____ years	_____ months
□ Walk	____ years	_____ months
□ Toilet trained	____ years	_____ months
□ First word	____ years	_____ months
□ Use of two words together	____ years	_____ months
□ Use of more than 3 words phrases	____ years	_____ months
□ Use of sentences	____ years	_____ months
□ Conversational language	____ years	_____ months
□ Reading	____ years	_____ months
□ Does the child enjoy being kissed etc..?	Yes	No
□ Does the child enjoy being read to?	Yes	No
□ Does the child enjoy watching TV?	Yes	No
□ Does the child enjoy reading books?	Yes	No
□ Does the child have gross motor problems?	Yes	No
□ Does the child have fine motor problems?	Yes	No
□ Does the child have speech and Language problems?	Yes	No
□ Does the child wet bed?	Yes	No

Appendix U

ALEX'S IEP OBJECTIVES

Alex is an advanced learner; he is 10 year old, his Individual Educational Plan IEP

has been developed for him, based upon the review of his skills provided by the

ABLLS.

B: VISUAL

1. B21: Alex will be able to draw a line from start to end in a maze which has 3 choice points for selecting the correct path.
2. B18: Alex will able to replicate 2 objects using at least 6 blocks or other items.
3. B19: Alex will arrange at least 4 sets of items for each of the 4 specified attributes (by size, quantity, sequence of completion, order, ABC, 123).

C: RECEPTIVE

4. C36: Alex will select 4 or more community helpers.
5. C39: Alex will select common environmental sounds when asked: "what do you hear?" Alex will select a picture of the item which makes the sound (at least 8 sounds).
6. C48: Receptive pronouns, Alex will follow directions which require selection involving pronouns (8 pronouns at least).
7. C50: Alex will select pictures representing a location or an activity presented in a scene e.g. scene of a beach, birthday party, picnics etc…

D: IMITATION

8. D13: Upon request, Alex will be able to demonstrate actions he observed several hours earlier in the day.

E: VOCAL

9. E6: Alex will imitate a sequence of numbers when you say for examples : "say 2 4 3 1 5"
10. E7: Alex will imitate words/phrases using a variety of tones volumes and speed.

F: REQUESTS:

11. F10: Alex will request/ask for items using a sentence "I want …"
12. F13: Alex will request information using "what" with a prompt.
13. F14: Alex will request information using "where" with a prompt.
14. F15: Alex will request information using "who" with prompts.
15. F21: Alex will ask for items/actions which he may want to obtain in the future.
16. F22: Alex will request items using 4 adjectives.
17. F24: Alex will request adverbs e.g. "push me fast".

G: LABELLING

18. G11: Alex will be able to use adjectives to describe objects.
19. G19: Alex will be able to label parts of items of a given picture which either missing or obviously incorrect (e.g. car without wheels).
20. Alex will label exclusion from category (negation) "what does not belong? (e.g. 3 food items and 1 car).

H: INTRAVERBAL

21. Alex will be able to fill in (20 or more fill in) the remaining word in a phrase naming the function of an item (e.g. you use scissors to … cut).
22. H9: When told the name of the item Alex will be able to fill in (20 or more fill in) the remaining word in a phrase naming a feature of the item (e.g. dog has a … tail).
23. H10: When told a feature of an item, Alex will be able to fill in (20 or more fill in) the remaining word in a phrase to name the item (e.g. something that has a tail is a … Dog).

I.: SPONTANEOUS VOCALISATION:

24. I1: Alex will say words or make some sounds hear in speech.
25. I3: Alex will spontaneously say phrases.
26. I4: Alex will sing songs with models.
27. I5: Alex will sing songs without hearing songs.

J: SYNTAX AND GRAMMAR:

N/A

K: PLAY & LEISURE SKILLS

28. K4: While playing independently, Alex will engage in at least 10 verbal responses in 20 minutes period.
29. K5: Alex will mutually interact with others students and toys for up-to 10 minutes

30. K6: While playing with a peer, Alex will engage in at least verbal responses.
31. K7: Alex will pretend to be (do) at least 10 characters or activities (e.g. a do, a cat a driver etc…).

L: SOCIAL INTERACTIONS

32. L1: Alex will engage in appropriate physical interaction behaviour while in close physical proximity with peers and siblings (at least 30 minutes).
33. L3: Alex will attend to the physical and verbal behaviour of peers.
34. L10: Alex will return greetings from others.
35. L13: Alex will approach and attempt to physically engage others in interactions.
36. L14: Alex will approach and attempt to physically prompt others to do a specific activity.
37. L21: Alex will label items for both adults and peers (single label for 1 peer and multiple for adults).
38. L22: Alex will get other's attention while attempting to interact.

M: GROUP

39. M1: Alex will sit appropriately in small group for 15 minutes.
40. M2: Alex will sit appropriately in large group up for 15 minutes.
41. M3: Alex will attend to teacher in group and follows directions.
42. M4: Alex will attend to other students in the group.
43. M6: Alex will follow instructions which are given to a group of students.

N: CLASSROOM ROUTINE

44. N1: Alex will line-up on request.
45. N3: Alex will complete a task and bring work to teacher or put away materials.
46. N5: Alex will work independently on academic activities (10-15 MIN).
47. N6: Alex will physically transition to next area of activity.

P: GENERALIZED RESPONDING:

48. P4: Alex will use skills in groups.
49. P5: Alex will be able to use other appropriate response after learning a response to a given situation. (e.g. dog, puppy, pooch).
50. P6: Alex will be able to use words acquired during one type of language skill to other types of language skills. (e.g. when taught cup as label, Alex will ask for a cup and receptively identify cups).

Q: READING:

51. Q3: Alex will be able to select the corresponding letter whine given the sounds associated with the letter.
52. Q8: Alex will match individual letters to letters on a word card.

53. Q9: Alex will fill in missing letter of words.
54. Q11: Alex will be able to decode words.
55. Q14: Alex will fill in missing words.

R: MATH

56. R5: Alex will count out objects form a larger set.
57. R7: Alex will identify numbers to 100.
58. R8: Alex will match number with same amount of objects.
59. R10: Alex will add two numbers 1 to 10.
60. R12: Alex will identify coins by name.

S. WRITING

61. S2: Alex will colour between the lines.
62. S6: Alex will copy letters with sample.
63. S8: Alex will be able print letters without a model.
64. S9: Alex will be able to print numbers without a model from 1 to 20.

T: SPELLING

65. T3: Alex will copy words.
66. T5: Alex will spell words.
67. T6: Alex will write dictated words.

U: DRESSING:

68. U4: Alex will put on/off buttoning shirts.
69. U5: Alex will put pants on/off.
70. U10: Alex will fasten zippers including starting a zipper.
71. U13: Alex will fasten snaps on part of clothing.
72. U14: Alex will undo and fasten belts.
73. U15: Alex will adjust clothing when needed.

V: EATING:

74. V5: Alex will spread with a knife.
75. V7: Alex will cut food with a knife.
76. V9: Alex will clean up table after meals.
77. V10: Alex will keep eating area clean.

W: GROOMING

78. W1: Alex will wash hands independently.
79. W2: Alex will dry hands independently.
80. W3: Alex will wash face independently.
81. W4: Alex will dry face independently.
82. W5: Alex will brush hair independently.

83. W6: Alex will brush teeth independently.

X: TOILETING

84. X6: Alex will be able to wipe self after bowel movement with less prompts.

Y: GROSS MOTOR

85. Y11: Alex will Gallop.
86. Y20: Alex will bounce a ball.
87. Y23: Alex will ride a bicycle.
88. Y24: Alex will be able to do jumping jacks.

Z: FINE MOTOR

89. Z9: Alex put spring type clothes pins on a line.
90. Z15: Alex will snip with scissors.
91. Z20: Alex will copy shapes and patterns.
92. Z23:Alex will paste shapes on outlined picture
93. Z24: Alex will paste shapes on plain paper picture.

Appendix V

ISAAC'S IEP Objectives

Isaac is an early learner; he is a 6 year old, his Individual Educational Plan IEP has

been developed for him, based upon the review of his skills provided by the ABLLS.

A: COOPERATION AND REINFORCER EFFECTIVENESS:

1. Al: When offered a known reinforcing item or activity, Isaac will take/use the item or activity.
2. A2: when offered one reinforcing item or activity and another non-reinforcing item or activity, Isaac will select the reinforcing item or Isaac will work for instructor controlled reinforcement.
3. A6: Isaac will work for a variety of items and activities as reinforcement. (E.g. tickles, pick-up visual-toy etc...).
4. A8: Isaac will work for praise for 5 minutes with back-up reinforcer.
5. A11: Isaac will wait appropriately if reinforcer delivery is delayed (1-5 minute).

B: VISUAL PERFORMANCE:

6. B1: Isaac will match an object to an identical object presented in array of three items.
7. B2: Isaac will match picture to an identical picture presented in an array of three pictures.

C: RECEPTIVE LANGUAGE:

8. C1: Isaac will look at or come to a person when called by his name.
9. C2: Isaac will follow instructions to do an enjoyable action under the conditions when the activity usually occurs (e.g. jump on trampoline) with prompts.
10. C3: Isaac will follow instructions to look at a reinforcing item.

11. C10: Isaac will comply with instruction to do a simple motor task (e.g. clap hands).

D: IMITATION:

12. D1: Upon request, Isaac will imitate a motor activity with an object.
13. D3: Upon request, Isaac will imitate a gross motor movement with verbal prompts: DO THIS.

E: VOCAL IMITATION:

14. E1: Isaac will imitate a sound upon request.

F: REQUESTS:

15. F1: Isaac will indicate specific items and activities which he wants by point to, pulling to, or standing by the particular items and activities(without using words or sign language).

G. LABELING:

N/A
H: INTRAVERBALS:

N/A

I: SPONTANEOUS VOCALIZATIONS

16. I1: Isaac will make a variety of babbles speech sounds totalling at least 10 minutes per day.

J: SYNTAX AND GRAMMAR:

N/A

K: PLAY AND LEISURE:

17. K1: Isaac will manipulate a toy or toys for at least 2 of 10 minutes period.
18. K2: Isaac will play with toys / manipulate toys as designed.
19. K8: Isaac will be able to engage in appropriate independent indoor leisure activities (2 activities for 5 minutes).
20. K9: Isaac will be able to engage in appropriate interactive leisure activities (2 activities for 5 minutes).

L: SOCIAL INTERACTION:

21. L1: Isaac will engage in appropriate physical interaction behaviour while in close physical proximity with peers or siblings with prompts.
22. L2: Isaac will tolerate/respond appropriately to positive touches by peers or siblings with prompts.
23. L3: Isaac will be able to attend to the physical and verbal behaviour of peers with prompts.
24. L17: Isaac will allow others to use items which he is using with prompts.

M: GROUP INSTRUCTIONS:

25. M1: Isaac will sit appropriately in small group teaching situation without disrupting others (up to 5 minutes).
26. M3: Isaac will attend to teacher in small group (1:2 groups for 50% of time).
27. M4: Isaac will attend to other students in group (1:2 groups for 50% of time).

N. CLASSROOM ROUTINE:

28. N2: Isaac will get and return own materials 50% of instructions without prompts.
29. N4: Isaac will work independently on non academic activities (1-5 minutes).
30. N6: Isaac will physically transition to next area of activity 50% with prompts.

P: GENERALIZE RESPONDING:

31. P2: Isaac will be able to use skills learned with one instructor with other instructors.
32. P3: Isaac will be able to use skills acquire in training situation in other situations.
33. P4: Isaac will spontaneously use acquired skills under group situations.

Q: READING:

N/A

R: MATH:

N/A

S. WRITING:

34. S1: Isaac will mark on paper.
35. S2: Isaac will colour large shapes.
36. S3: Isaac will trace straight lines.
37. S4: Isaac will roughly copy straight lines.

T: SPELLING:
N/A

U: DRESSING:

38. U1: Isaac will either pull up or down pants.
39. U2: Isaac will either remove or put shoes on.
40. U11: Isaac will close a zipper which is started on an article of clothing.

V: EATING:

41. V2: Isaac will drink from a straw with prompts.
42. V3: Isaac will drink from a cup without spilling.

W: GROOMING:

43. W1: Isaac will wash hands with minimal prompts.
44. W2: Isaac will dry hands with minimal prompts.
45. W3: Isaac will wash face with minimal prompts.
46. W4: Isaac will dry face with minimal prompts.

X: TOILETING:

47. X1: Isaac will urinate in the toilet at least 2 times a day.

Y: GROSS MOTOR:

48. Y3: Isaac will walk forward with appropriate gait.
49. Y6: Isaac will run smoothly.
50. Y7: Isaac will be able to get into and out of a squatting position.
51. Y8: Isaac will roll sideways.
52. Y12. Isaac will jump forward using two feet.
53. Y13: Isaac will jump down for an object.
54. Y22: Isaac will ride a tricycle.
55. Y25: Isaac will climb a ladder using reciprocal motion.
56. Y26: Isaac will walk across a balance beam.

Z: FINE MOTOR:

57. Z1: Isaac will place object in a form box
58. Z2: Isaac will place pegs in peg board.
59. Z3: Isaac will be able to put single piece inset puzzle pieces into frames.
60. Z5: Isaac will be able to stack blocks.
61. Z7: Isaac will be able to put rings on pegs.
62. Z8: Isaac will be able to transfer objects from one hand to the opposite hand.
63. Z11: Isaac will remove lids of jars.
64. Z13: Isaac will remove wrappers.
65. Z14: Isaac will open "Zip-lock" type bags.
66. Z24: Isaac will paste shapes on plain paper picture.
67. Z25: Isaac will be able to trace lines with a finger.
68. Z26: Isaac will turn pages of a book.

Appendix W

Eye Contact

STUDENT: _____

Acquisition   **Maintenance**   **Generalization**

SD1: Child's name

Program procedure:

1. In response to name …. Sit in a chair across from the child. State the child's name and simultaneously prompt eye contact by bringing an edible reinforcer to your eye level. When the child makes eye contact with you for 1 second, immediately give reinforcer to the child. Over the teaching session, say the child's name and delay your prompt by couple of seconds to assess if the child looks without the prompt. Differentially reinforce responses demonstrated without prompts. Throughout teaching sessions, provide positive reinforcement if child looks at you spontaneously.
2. **For 5 seconds** … repeat procedure in (1) but sustain eye contact for 5 seconds prior to giving the reinforcer to the child. Differentially reinforce responses demonstrated without prompts.
3. While playing... give a toy to the child to play with at the table. Sit across from the child and say the child's name. Prompt the child to look at you and reinforce the response. Fade prompts over subsequent teaching trials.
4. From a distance … repeat procedure in (3) but sit or stand at a distance of 3 feet. Say the child's name and prompt the child to look at you. Reinforce the response. Fade prompts over subsequent teaching trials. Differentially reinforce responses demonstrated with the lowest level of prompt. Gradually increase the distance between you and the child

Materials: Edible and tangible reinforcers.
Suggested Prerequisites: sit in a chair/

Prompting tips: Bring reinforcer to eye level for child to track gently guide child's chin upward to prompt eye contact. Use a time-delay procedures: delay the prompt by 2 second increments across trials.

SD1: Say child's name	Response (makes eye contact 1-5)	Date Introduced	Date Mastered
1. for 1 second			
2. for 5 seconds			
3. while playing			
4. from a distance			

Appendix X

COME HERE Programme

STUDENT: _____

Acquisition   **Maintenance**   **Generalization**

SD: Child's name "COME HERE"

Programme Procedure:

1. Make 30 cm distance between you and the student and then give the SD and prompt the child to come and sit in a chair and immediately reinforce him/her.
2. Start fading the prompt from physical to gesture prompt (from most to least). Once mastered start increasing the distance gradually (see table below) until s/he is able to come independently to sit in a chair without any prompt.

Materials: Edible and tangible reinforcers.

SD: "name ...come here"	Response	Date Introduced	Date Mastered
1. From 30 cm distance			
2. From 50 cm distance			
3. From 1 m distance			
4. From 1.5 m distance			
5. From any distance			

Appendix Y

Tolerance Programme

STUDENT: _____

Acquisition   **Maintenance**   **Generalization**

SD1: Wait …..
SD2: …Get it.

1. Establish attending and place a piece of food on the table. Make sure that the child will not succeed grabbing the food. State the instruction "wait" start counting to 5 on your fingers to show the passage of time. Give a quick praise.
2. Immediately say SD2 "get it" (as receptive command). The child will be only allowed to get the food when the teacher instructs him/her to get it. If in case the child was able to grab it before the SD2 take it away from him. Use physical prompt to keep the child's hands away from table while waiting for SD2. Use prompts and fade them over subsequent trials. Start increasing the waiting time. Differentially reinforce responses demonstrated with the lowest level of prompting.

Instruction: SD1	Response	Date introduced	Date Mastered
Waiting for 5 second			
Waiting for 10 second			
Waiting for 20 second			
Waiting for 30 second			
Waiting for 40 second			
Waiting for 50 second			
Waiting for 1			

minute			
Waiting for 90 second			
Waiting for 2 minute			

Appendix Z

The Autistic Centre

Individual Programme Sheet

STUDENT: _____

Acquisition   **Maintenance**   **Generalization**

Non Verbal Imitation Gross Motor (NVI GM)

SD: DO THIS...

Items	S	M
15. Waving	---------------	---------
16. Clapping	---------------	---------
17. Arms up	---------------	---------
18. Knock	---------------	---------
19. Stamp feet	---------------	---------
20. Shake head	---------------	---------
21. Rub hands	---------------	---------

22. Touch nose	---------------	---------
23. Hands on waist	---------------	---------
24. Pat legs	---------------	---------
25. Touch elbow	---------------	---------
26. Cover mouth	---------------	---------
27. Touch ear	---------------	---------
28. Hands on head	---------------	---------
29. Pat tummy	---------------	---------
30. Touch toes	---------------	---------
31. Touch shoulders	---------------	---------
32. Wipe mouth	---------------	---------
33. Indian pat.	---------------	---------

Appendix AA

Open Ended Questions

Personal View of parents and teachers
Of the children's performance and progress

Question 1: What were your goals prior to starting AVB program for your son?

Alex's teachers:" adapting well to: social interaction; starting conversation, mathematic operations."

Alex's Parents: "attending well to teachers, better social interaction; group work; vocalizations.

Karl's teachers: Eye contact; responding to instructions; playing with others; waiting."

Karl's parents: "improve eye contact, communication skills; to know how to deal with him during the day without temper tantrums; to deal with his behaviours in general.

Zack's teachers: "stopping tantrums, and teaching him good behaviours and less avoidance from work, quick response".

Zack's parents: "help my child to behave better and express him-self and his needs, better social interaction".

Andre's teachers: "fewer tantrums better eye contact, waiting, less drooling and better attending skills".

Andre's parents: "Andre will have self-help skills, independent as much as possible, more sociable and well behaved and finally improving his academic skills."

Patrick's teachers: "fewer tantrums, imitation, better attending skills, waiting, social interaction, simple matching skills and follow simple directions."

Patrick's parents: "to get my child to be more sociable, start and improve expressive talking and integrate in regular school"

Sarah's teachers: "vocalization, imitation, following instructions, and better understanding of language and social interaction, group work".

Sarah's parents: "Better attending skills; improve her behaviours, vocalizations, and better self-help skills".

Jad's teachers: "to decrease his aggressive behaviours, teaching to use mands, group work, and academic skills and sharing and taking turns etc…

Jad's parents: "to improve my child"

Isaac's teachers: "to decrease his self-stimulatory behaviours, teaching to use mands, do some group works etc..."

Isaac's parents: "to improve his behaviours".

Mustapha's teachers: "better attending skills, some academic skills, and social interactions with peers".

Mustapha's parents: "better social skills and academic skills with improved behaviours".

Hassan's teachers: "he needed work on his behaviours, communication and social skills".

Hassan's parents: "he had lots of communication problems, he did not use language spontaneously, and he suffered from severe temper tantrums.

Question 2&3: How did your goals changed as you proceeded through the program?

Alex's teachers: "improved reading and social skills, he became a helper or an assistant to us like a mini-therapist".

Alex's parents: "better socialization and helping others."

Karl's teachers: "Karl was very fast and acquired a lot of academic skills; he made quicker progress comparing to similar children of his age."
Karl's parents: "I wanted more academic work since Karl showed a significant improvement and learns very quickly."

Zack's teachers: "since his behaviour has improved we introduced new goals: better interaction, more academic skills".
Zack's parents: "he can use signs to tell about his needs, his interests in others are now much better".

Andre's Teachers: "His drooling had stopped, his behavioural has improved so much, he is more alert and his eye contact is excellent, he is responding to his name and to some simple instructions and he understands the concept of waiting.
Andre's parents: "He is more present, his attention and eye contact improved, he is more sociable and his behaviour when we go out is much better".

Sarah's teachers: "seeking social interaction with peers and adults spontaneously, became toilet trained, and she is happily wearing her lovely hair band which was impossible before the implementation of an AVB program".
Sarah's parents: "she has become a sociable child now and by a miracle she became potty trained, by miracle we mean the AVB program. She is a gorgeous little girl with lovely hat and hair band where I used to dream of her wearing them".

Jad's teachers: "very surprised that he started making friends and enjoying their company, he became very helpful in the class room or in the play-ground attending to the teachers and helping his peers when needed".

Isaac's teachers: "we were very surprised with the outcomes that he started manding and doing matching".

Isaac's parents: "we were able to take him outings where we enjoyed the Christmas day with all the family".

Mustapha's teachers: "many advanced objectives were introduced because he mastered all his programs in a very short period of time."

Mustapha's parents: "I was so depressed and I felt better during the implementation of the AVB program".

Hassan's teachers: "once he acquired the attending skills it became easier to teach him academic and social skills".

Hassan's parents: "he is learning anything very fast he is trying so hard, GOD bless him and bless the AVB program".

Question 4&5: Did you reach your goals, please explain?

Alex's teachers: "He can play and enjoy playing with peers and wait his turn, he is able to say all the letters with better articulation".

Alex's parents: "Alex is very happy to learn"

Karl's teachers: "Karl reached more than his assigned goals, he can do things that can be easily adapted to it comparing him with even older regular children (puzzles, matching."

Karl's parents: "same answer as 4.4&5.

Zack's teachers: "he is more present and he is very cooperative now and he can easily follow instructions".

Zack's parents: "use more language and better communication".

Andre's teachers: "he is easily redirected into works and play".

Andre's parents: "surely, if I want to reach my goal I will never be satisfied but for the rhythms of Andre there is improvement but some more academics tasks needs to be worked on".

Patrick's teachers: "Patrick has reached all his goals and met all the IEP objectives and he even started initiating social interaction with peers and regular students in the play ground and during extra curricular activities".
Patrick's parents: "despite some improvements, the above goals were not yet achieved."

Sarah's teachers:" she reached all her goals and she was very happy to learn and make friends".
Sarah's parents: we are very happy with her progress and now she relates better to us and her brother where she is taking turns and sharing toys with him".

Jad's teachers:" he reached all his goals and he was very happy to learn and make friends he stopped getting aggressive towards others".
Jad's parents: "we are very happy for him to get to this point and reaching all his goals".

Isaac's teachers: "he is a lot calmer and happy to work, he tolerate waiting for longer period".
Isaac's parents: "happy with the result".

Mustapha's teachers: "he reached all the IEP's objectives very fast then we had to introduce new advanced objectives concerning his social and academic skills".
Mustapha's parents: "he can wait and follows instructions easily and he is more organized and does not tantrum any more."

Hassan's teachers: "once his behaviours have improved, he was very motivated to learn and he became more sociable."
Hassan's parents: "he is easier to communicate with him, he can do some academic tasks which we dreamt of him doing".

Question 7 &8: Did you consider these surprises as positive for your son. Please explain?

Alex's teachers: "He learns by observation, or incidental learning as he learnt a French song by just hearing us singing it; he also cares about peers and take care of them"
Alex's parents: "Better socialization, circle time and academic work."

Karl's teachers: "Karl progressed in every way even in vocalizing more than we expected. He is very intelligent and great".
Karl's parents: "positive surprises. I have not expected Karl to learn so much and in a quick way".

Zack's teachers: "social interaction, more expressive about his emotion, more compliant".
Zack's parents: "he is behaving much better".

Andre's teachers: "he is more sociable with others and peers, he is integrating really well with regular children and he had made some friends".
Andre's parents: "I can't believe that he can wait now and he understands the concept of waiting, he stopped turning the TV on and off all the time. It is magical".

Patrick's teachers: "Patrick started eating solid food as he was still bottle fed and using liquidized baby food only. He learned to climb up and down the stairs where his fine motors were significantly improved ".

The parents of Patrick were not sure if the surprise were positive or not and they did not want explain despite the attempts of the researcher.

Sarah's teachers: "well behaved and better social interaction than we expected especially with regular students".

Sarah's parents: "we can now go outing, to the park to play with other children, going to restaurant and amusement park with no problem whatsoever".

Jad's teachers: "the aggressive behaviours and throwing everything from the window has stopped completely thanks to the AVB techniques

Jad's parents: "Jad has become a lot calmer and he listens to instructions. He is a lot easier to deal with".

Isaac's teachers: "he acquired very good matching skills, which helped him to communicate his needs using words or pictures spontaneously".

Isaac's parents: "we can't believe that he can discriminate colours, matching. He can work and wait for longer period where we used to think it was impossible for Isaac to achieve such goals".

Mustapha's teachers: "he is learning very fast following the AVB programs he is quickly grasping any concept that it is taught to him."

Mustapha's parents: "he can sing, count, he has friends".

Hassan's teachers: "he learnt to use words spontaneously and his social skills, behaviours and his attending had significantly improved".

Hassan's parents: "we did not expect during this year to use words to communicate and to stop his tantrums is a gift from GOD. Now we feel he is like any other typically developing child".

Question 9&10: Was there anything you dislike about AVB, program please explain?

Teachers' and parents' answers were in favour of the program and they did not have anything to dislike about the AVB program except for Patrick's parents which is

mentioned later in this section. One of Mustapha's teachers had some reservation (the rest of the teachers did not)

Karl's parents: "of course not, it is great program and I start to apply it also with my daughter."

Patrick's teachers: " The AVB program was very beneficial for Patrick as he was able to behave like a 3 years old child at school and become independent in his self-help skills were he was not given a chance at home and he was treated like a 5 month baby. He would have made a better progress if the parents were more cooperative with the teachers".
Patrick's parents: "lack of easy homework and lack of availability of speech therapy and lack of integration in regular school".

Mustapha's teachers: "it is very effective program especially for Mustapha as he was learning new skills very fast".

One of Mustapha's teachers: "the daily data, student needs for his work the intervention of an adult".

Question 4.12&13 would you recommend AVB program to others and why?
All the teachers have agreed to recommend AVB programs to others because "it is effective and the measurements of the progress are obvious and improvement does not take long to show".
Alex's teachers: "We can touch the progress immediately and very fast".
Alex's parents: "It worked for my son and he is very happy to learn and help others".

Karl's teachers: "We can touch the progress immediately and very fast".
Karl's parents: "because of the positive outcomes which I have never dreamt of".

Zack's teachers: "since intensive stimulation, errorless teaching and reinforcers i.e. the basics for an AVB programs are the best way to deal and teach autistic children".

Zack's parents: "AVB programs helps a lot in several ways."

Andre's parents: "because I am sure it will give good results."

Patrick's parents: "we noticed some changes in our son's behaviour and socialization and attention."

Sarah's parents: "It is a very effective program and the results are quick to emerge and every body can notice them".

Jad's parents: "if it worked for Jad it must be the best programs ever. Jad does not hit his cousin any more and they are the best friend now where it used to be a dream of all our family to watch them play together".

Isaac's parents: "because it works and the results are very clear".

One of Mustapha's teachers: "we recommend the AVB program because it is effective with the students".

Mustapha's parents: "it is very effective and has proven results".

Hassan's parents: "my son has improved tremendously".

Question 15: Any other comments about your experience of implementing an AVB program for your child?

The teachers of all the children have given the same statements:" it is quite effective and children are very happy to learn which is in return very rewarding to us".

Alex's parents: "it is a gift from GOD".

Karl's parents: "it gave me a lot of pleasure to work with the group and it has been a great experience although tiring but rewarding".

Zack's parents: "being consistent and aware of AVB program will help well".

Andre's parents: "My experience this year was good, Andre is much better than the previous years when he did not have the AVB program."

Patrick's parents: "may need more one to one teaching".

Sarah's parents: "it is the best program ever".

Jad's parents: "we will try to meet your standard because we could not believe that Jad was capable of achieving the goals you have set".

Isaac's parents: "it is a wonderful experience we don't want it to finish".

Mustapha's teachers: "it is a very good experience".
Mustapha's parents: "I feel now that dealing with my son is a lot easier than before thanks to the AVB program".

Hassan's parents: "It is a gift from heaven".

Appendix BB

The BLAF Advanced Learner

Alex is a verbal child who scored around Level 4 on "The BLAF" (advanced learner).

1. **Cooperation with Adults**

   Level 5: Alex works well for 10 minutes at a table without disruptive behaviour.

2. **Requests**

   Level 4: Alex uses 5-10 words, sings or pictures to ask for reinforcers.

3. **Motor Imitation (Mimetic)**

   Level 4: Alex imitates several fine and gross motor movements or request.

4. **Vocal Play**

   Level 4: Alex vocalises frequently with varied intonation and says few words.

5. **Vocal Imitation (Echoic)**

   Level 3: Alex vocalizes many speech sounds with varied intonations.

6. **Matching to Sample**

   Level 5: Alex can match most items and match 2 to 4 block designs.

7. **Receptive**

   Level 4: Alex can follow many instructions and point to at least 25 items.

8. **Labelling (Tacts)**

   Level 5: Alex identifies over 100 items or actions and emits short sentences.

9. **Receptive by Function, Feature, and Class**

   Level 2: Alex will identify a few items given by synonyms or common functions.

10. Conversational Skills

Level 2: Alex can fill a few missing words and provide animal sounds.

11. Letters and Numbers

Level 4: Alex can read at least 5 words and identify 5 numbers.

12. Social Interaction

Level 3: Alex readily asks adults for reinforcers.

The BLAF Early Learner

Isaac is a non verbal child who scored around Level 1 on "The BLAF" (early learner).

1. **Cooperation with Adults**

   Level 1: Isaac is always uncooperative, avoids work, and engages in negative behaviour.

2. **Requests**

   Level 2: Isaac pulls people, points, or stands by reinforcing items.

3. **Motor Imitation (Mimetic)**

   Level 1: Isaac cannot imitate anybody's motor movements.

4. **Vocal Play**

   Level 1: Isaac does not make any sounds.

5. **Vocal Imitation (Echoic)**

   Level 1: Isaac cannot repeat any sounds or words.

6. **Matching to Sample**

   Level 1: Isaac cannot match any objects or pictures to a sample.

7. **Receptive**

   Level 1: Isaac cannot understand any word or follow directions.

8. **Labelling (Tacts)**

   Level 1: Isaac cannot identify any items or actions.

9. **Receptive by Function, Feature, and Class**

   Level 1: Isaac cannot identify items based on information about them.

10. Conversational Skills

Level 1: Isaac cannot fill-in missing words or parts of songs.

11. Letters and Numbers

Level 1: Isaac cannot identify any letters, numbers or written words.

12. Social Interaction

Level 2: Isaac physically approaches others to initiate an interaction.

Appendix CC

Educational Survey

Class Room: _____   Date: _____
School: _____   Time observation started: _____
Teacher: _____   Time observation ended: _____
Type of classroom: _____

Classroom Environment
1. Are the structure and the layout of the classroom appropriate to skills acquisition?
   □Yes   □ No
   If No please state: _____
   _____

2. Are there any factors that may interfere with the learning, teaching process?
   □Yes   □ No
   If yes please state: _____
   _____

3. Are the facilities, such as toilet, kitchen and furniture appropriate to the students?
   □ Yes   □ No
   If No please describe: _____
   _____
   _____

Staff
4. How many staffs are in the classroom?
   _____ Staff

5. How many staffs are qualified to work with children with autism?
   _____ Staff
6. Did all the staff receive special training on the use of ABA program?
   □ Yes   □ No
7. Do the staffs in the classroom appear to be happy?
   □ Yes   □ No
8. Do the staffs provide frequent praise to the students?
   □ Yes   □ No

9. Do the staffs appear to be competent to handle the teaching/learning process with the students?
    □ Yes   □ No
10. Do the staffs seem to be able to handle disruptive and aggressive behaviour by the students?
    □ Yes   □ No
11. Do the staffs attend quickly and promptly to the needs of the students?
    □ Yes   □ No

12. Are data on acquisition skills collected daily?
    □ Yes   □ No
13. Do the staffs provide a high rate of reinforcement for correct responses?
    □ Yes   □ No
14. Do the staff provide high rate of praise or reinforcement for appropriate behaviour (out of teaching session)?
    □ Yes   □ No
15. Do the staffs use the reinforcement's procedures effectively and appropriately with the students?
    □ Yes   □ No
16. Do the staffs use differential reinforcements?
    □ Yes   □ No
17. Do the staffs appear to be competent in errorless teaching procedures?
    □ Yes   □ No
18. Are the staffs using fast-paced instruction to keep the motivation for other reinforcers low (self stim etc...) and the value of the controlled reinforcers strong?
    □ Yes   □ No
19. Do the staff use prompts as needed and fade them as quickly as possible?
    □ Yes   □ No
20. Do the staffs capture and contrive situations throughout the day to teach manding, tacting and Intraverbals skills?
    □ Yes   □ No
21. Do the staffs use teaching procedures in both structured and non structured situations?
    □ Yes   □ No
22. Do the staffs use generalization program for acquired skills?
    □ Yes   □ No
23. Do the staffs use alternative form of communication (e.g. Makaton sign Language, ASL, PECS etc...)?
    □ Yes   □ No
24. Do the staffs appear to follow the instructions appropriately in order to deliver the therapy to the students?
    □ Yes   □ No
25. Do the staffs appear to be able to do active teaching of manding skills?
    □ Yes   □ No
26. Are the staffs capable of doing active teaching of labelling skills?
    □ Yes   □ No

27. Are the staffs capable of doing active teaching of conversational skills?
    □ Yes   □ No
28. Are the staffs capable of doing active teaching of receptive, expressive language skills?
    □ Yes   □ No
29. Do the staffs appear to be able to contribute to design an IEP for the students?
    □ Yes   □ No
30. Do the staffs look for early signs of escape/avoidance behaviour and when she sees them intersperse easy responses?
    □ Yes   □ No

31. Do the staffs seem competent in the protocol to reduce attention/activity seeking behaviour?
    □ Yes   □ No
32. Are the staffs capable of applying the protocol to reduce escape/motivated behaviour?
    □ Yes   □ No
33. Do the staffs appear able to handle extinction and teaching replacement behaviour to the students?
    □ Yes   □ No

Students
34. How many students are in the classroom?
    _____ Students
35. Is there any student with other diagnosis than autism?
    □ Yes   □ No
36. Are the students in the classroom reasonable match for each other?
    □ Yes   □ No
37. Do the children exhibit disruptive or aggressive behaviour that may interfere with teaching and learning?
    □ Yes   □ No
38. Do the students in the classroom appear to be happy and motivated to work?
    □ Yes   □ No
39. Are the students coming promptly when asked to "come here"?
    □ Yes   □ No
40. Are the students required to actively respond during teaching session?
    □ Yes   □ No
41. Are the students happy to receive primary reinforcers from the teacher?
    □ Yes   □ No
42. Are the students happy and motivated to receive social praises?
    □ Yes   □ No
43. Are the students appearing to be engaged in self-stimulatory behaviour?
    □ Yes   □ No

Curriculum

44. What is the basis of the curriculum?
    □ Academic   □community based   □ self- help   □ Language based
45. Do the students have an Individualized Educational Plan "IEP"?
    □ Yes   □ No
46. Does the classroom curriculum meet the student needs?
    □ Yes   □ No
47. Are there any skills that the students might need to learn and can not be addressed in the classroom.
    □ Yes   □ No
48. Does the classroom have a defined schedule?
    □ Yes   □ No
49. Do the staffs seem able to follow the classroom schedule?
    □ Yes   □ No

Training and Support for staffs

50. Who provide the training for the staff?

_____

_____

51. How much time do the consultants spend in the classroom?

_____

52. Do the staffs receive training and support from other professionals?
    □ Yes   □ No
    If yes please state: _____

_____

More information about the program

53. What is the length of the school day?

_____

54. How many school days are there in the school year?

_____

55. Do the school have summer program?
    □ Yes   □ No
56. Is the summer program different from the school year?
    □ Yes   □ No
57. Are there any opportunities for the students to integrate with regular students?
    □ Yes   □ No
58. Do the parents have the opportunities to learn teaching skills?
    □ Yes   □ No
59. Do the staff and parents share information regarding the students?
    □ Yes   □ No