

**THE UNIVERSITY OF HULL**

**AN INVESTIGATION OF SOCIAL SKILLS TRAINING FOR  
PUPILS WITH AUTISTIC SPECTRUM DISORDERS WITHIN A  
MAINSTREAM SCHOOL ENVIRONMENT**

**being a Thesis submitted for the Degree of Doctor of Psychology**

**in the University of Hull**

**by**

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## **ABSTRACT**

**Children with autistic spectrum disorders (ASD) are disadvantaged within a learning environment that is not conducive to their cognitive and learning styles (Mesibov and Howley, 2003): this is because they do not possess the necessary social, communication and thinking skills that are required for effective communication and learning to occur within the context of a complex learning environment such as a mainstream school. Indeed, the absence of these cognitive skills within a traditional teaching environment can actually represent a barrier to learning for children with ASD (Mesibov and Howley, 2003).**

**The main aim of this study was to examine the effect of social skills training on pupils with ASD and determine whether or not the disadvantages of a mainstream education could be mitigated by social skills training; it was also important to establish which particular methods were the most effective within a normal classroom environment.**

**The training material (IV) contained specific learning targets necessary for social functioning: the methodological framework used was predominantly experimental although some qualitative measures were included. Twelve secondary school pupils (two groups of 6) between the ages of 11 and 15 years took part in this study: the participants were matched as closely as possible in terms of intelligence quotients, attainment levels, gender and behavioural traits; the resulting pairs were then randomly assigned to either the treatment or control condition.**

**A two-group research design was used with one group (Group A) comprising the experimental condition and the other (Group B) acting as a control. Two measuring points were used, Time 1 and Time 2; the first of these was baseline whilst the other was post intervention. The participants that took part in this study attended the same school which was based in the North East of England.**

**The findings of the study revealed that there were marked differences between baseline measures and the intervention phase for the experimental group in the acquisition of the social skills targeted: these differences were statistically significant and applied to all eight dependent variables; on the other hand, the dependent measures for the control group or comparison remained relatively unchanged from baseline levels.**

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## **CHAPTER ONE: INTRODUCTION**

**It has been estimated by the National Autistic Society that 200 in every 100,000 children born in the United Kingdom each year develop a serious disorder that affects their ability to communicate, socialise and learn appropriately. We call this condition autistic spectrum disorder or ASD: it is a life-long condition the aetiology of which is not related to interpersonal factors, that is, it has nothing to do with bad parenting, emotional trauma, neglect or a lack of love by carers. Rather, it is a developmental disorder due to a dysfunction of specific neurological structures in the brain (Attwood, 2004): these structures may not be fully developed due to chromosomal abnormalities or have been damaged during pregnancy or at birth.**

**At first the condition goes un-noticed by parents, who often regard their developing infant as quiet and untroubled; with the passage of time, however, their initial impression of a placid baby may change as the parents begin to suspect that their child may have hearing difficulties. This impression often occurs with the realisation that the child does not respond to the normal overtures made by parents and others. Indeed, a common concern often reported by parents around this time is a lack of responsiveness (anticipatory behaviour) on the part of the child: in other words, he or she does not smile, raise his or her arms at the prospect of being picked-up or show pleasure at the approach of parents.**

**By the time the child has reached his or her first and second birthdays, there is usually clear evidence that the toddler is uninterested in others, engages in**

solitary play and does not demonstrate the same need as other children of the same age to interact and socialise with its carers. There may be a paucity of expressed speech and the child is often described as “being in a world of his or her own”. As well as being unresponsive the child may present as irritable and display temper tantrums.

As the child reaches his or her third and fourth anniversaries there may be obvious repetitive behaviours, an absence of gestures, a lack of eye-contact and a tendency to place his or her hands over their ears, make bizarre noises and present with odd postures. The child may shun affection and only make physical contact on his or her terms: although the child may show a preference for one particular parent, the same level of attachment may not be generalised to other family members.

As time passes the behavioural traits referred to above will remain with the child, but may be expressed in developmentally inappropriate forms. The early expressive language deficits may take on a repetitive style and lack social content, the observed aloneness or isolation may give way to shyness or an appearance of extreme awkwardness; the solitary play may be replaced by a strong fascination for particular toys or objects such as vacuum cleaners, washing machines, dinosaurs or even relatively uninteresting materials such as stones or pieces of string. There is also likely to be a great reluctance on the part of the individual to accept change of any sort, he or she may use hand flapping for no apparent reason, produce what seems to be meaningless grimaces and demonstrate food fads for items such as crisps or yogurt.

**As the child approaches 4 years of age, he or she will probably show no imaginative play; there may be some gestures present but not those used strictly for communication. Interestingly, the child may enjoy rough-and-tumble play and this often provides the only satisfactory way for parents to make close physical contact with their child.**

**On occasions the child may show extreme fear responses in relation to what for most children are normal everyday situations; for instance, meeting unfamiliar people, having a hair cut or being expected to engage in a social situation, such as, attending a nursery or shopping at a supermarket for the first time.**

**Many authors have described the above developmental patterns in children with ASD (Attwood, 2004; Wing and Gould, 1979; Howlin, 2003; and Frith, 1991). Children with these clusters of behaviours may express them to varying degrees and there may be a total lack of speech or at least deviant language: on the other hand, the individual may have relatively good language skills, but fail to use them for interpersonal communication, but nevertheless talk incessantly about a preferred topic.**

**As the individual gets older the early lack of play may be expressed as deficits in creativity and an inability to generate ideas and find solutions to problems; general learning appears to hold little meaning for the individual who will often adhere to restricted patterns of behaviour and forming relationships can remain problematic for a very long time.**

The intelligence of children described above may vary considerably with some being within the severely delayed category, whilst others range from average to well above. However, what they all have in common is a condition called autism (ASD). This means that they have marked difficulties with social understanding, communication and creativity, which collectively Wing and Gould (1979) describe as the "Triad of Impairments".

In practical terms those with ASD find it difficult to interact with others, communicate their ideas and feelings and develop friendships, comprehend social rules (that seem to come naturally to most people) and benefit from normal educational processes; as a result, individuals with ASD are likely to become withdrawn, isolated, unhappy and frightened.

Before going on to outline treatment approaches for individuals with ASD, it is worth discussing the importance of involving parents and other carers as part of the data gathering process in relation to identification of the condition. Whilst there is general agreement about the ability of researchers to correctly identify mental health disabilities, there is less confidence amongst researchers that practicing clinicians can achieve the same level of accuracy, even when using the same diagnostic classification system (Prendergast et al., 1988). The disparity between the two groups has been attributed to disagreement amongst informants regarding the nature and severity of the disorder (Rutter, 1967). The situation has been clarified recently with studies showing that the most reliable information concerning an individual's disability occur when data is gathered in combined form from parents and child (Fonagy et al., 2005).



As well as enlisting the help of parents and teachers in the diagnostic process related to ASD, there is now a deliberate attempt to encourage parents and professionals to engage in joint working practises as equal partners. Indeed, the necessity of making an accurate assessment of an individual's strengths and weaknesses is an essential part of constructing and delivering an effective treatment plan (Fonagy et al., 2005). In fact, Rutter (1985b) also makes the point that by enlisting professionals and parents as co-therapists enables those involved to acquire problem-solving skills for current and future challenges.

Although there is no cure available for ASD at the present time, there have been significant developments in educational interventions in the last 30 years that have improved the lives of thousands of individuals with the condition (Mesibov and Howley, 2003). Intervention models are generally of two types: one is based on learning theory and includes methods that systematically change behaviour in measurable ways by the application of reinforcement contingencies (Sulzer-Azaroff and Mayer, 1991). This model therefore presupposes that the individual's deficits are due to faulty learning, and as stated above can be corrected by the application of learning theory methodology; the other is developmental in orientation and seeks to identify deviance in individuals from normal pathways of development. Once deviant development is identified, corrective measures are applied in the form of planned intervention strategies: the assumption underlying this model is that a child's developmental symptoms reflect unique biological mechanisms that control affect, information processing, motor planning and symbol formation (Greenspan and Wieder, 1997). Relationships and affective interactions may

go awry because of processing difficulties; effective interventions are therefore aimed at re-establishing normal interactional patterns.

Although the above conceptual frameworks between developmental and behavioural approaches to interventions are different, in practice there is a great deal of overlap across the various models. Developmental researchers often criticise behaviourist approaches for failing to target specific deficits in ASD, which results in isolated skills that cannot be transferred within a developmental framework (Rogers and Lewis, 1989). This is countered by the behaviourist “camp” which maintains that irregularity of skills development decreases the need to carefully adhere to normal developmental sequencing (Anderson and Romanczyk, 1999).

Neither of the two approaches discussed above are able to offer a perfect solution for ASD and this is because the difficulties associated with the condition are not simply due to language difficulties (symbol formation) or cognitive deficits (learning difficulties), but more a function of the individual's inability to understand social situations, communicate effectively and think creatively; in other words, his or her behaviour is a function of what Wing and Gould (1979) describe as the “Triad of Impairments”. Those with the disorder do not possess the fundamental skills that allow interpersonal communication, socialisation and exchanges in ideas to occur between themselves and others: it is therefore not simply a question of failing to learn or to acquire these essential skills, but as stated above, a centrally based dysfunction that prevents social learning from occurring.



Support for a brain dysfunction comes from neuropsychological studies using brain imaging techniques that suggest that there may be quite precise areas of the frontal lobes, such as the medial frontal region or Brodmann's area 8 that, if impaired in early childhood, could produce patterns of behaviour and abilities of ASD (McKelvey *et al.* 1995; Fletcher *et al.* 1995; Happe' *et al.* 1996; Prior and Hoffman 1990; Rumsey and Hamburger 1998; Volkman *et al.* 1996). Attwood (2004) also maintains that there is tentative evidence for right hemisphere cortical dysfunction, since this causes a syndrome called Non-verbal Learning Disabilities (NLD). As Attwood (2004) suggests, deficits in non-verbal learning are quite common features seen in ASD.

Providing evidence for a biological basis for ASD means that individuals with the disorder cannot simply be categorised as people with straightforward learning difficulties that will respond to traditional teaching strategies used for slow learners; such as, over-learning, rehearsal and Precision Teaching. In fact, the current situation presents significant challenges for teachers as well as parents, since interventions will have to be designed that can appropriately engage those with ASD and take account of the unique cognitive deficits that define the condition.

A system of intervention that acknowledges difficulties such as behavioural versus developmental models and can be accessed by children with ASD is that described by Mesibov and Howley, (2003). It is known as Treatment and Education of Autistic and related Communication handicapped Children (TEACCH). This intervention package works with the individual's deficits rather than trying to change them directly: this is done by providing structure within the

learning environment, using visual material to show steps or sequencing of tasks, whilst minimising the use of complex language. This in turn reduces the individual's anxiety (that occurs in response to worrying about trying to understand complex linguistic instructions) and instead allows the pupil to access learning material that is visually delivered. Mesibov and Howley (2003) maintain the following in relation to structured teaching:

*“Pupils with ASD who use this approach are calmer, more self-assured and are able to work productively and independently for longer periods of time. The use of Structured Teaching, as a method of delivering the curriculum, can enhance and facilitate the teaching and learning process and can improve access to the curriculum for many pupils with ASD”.*

Jordan (2002) speaks very highly of the TEACCH system and maintains that it is more realistic and respectful of human rights and provides equal opportunities for pupils with ASD to access the curriculum: by this she means that the structure and visually presented learning material places pupils with ASD on a par with their non-autistic peers and thereby ensures that they are not disadvantaged.

In addition to the benefits of structured teaching, there is emerging evidence to suggest that by addressing the social, communication and thinking impairments of children with ASD, it is possible to enable them to function more effectively (Bellini, 2000). Knowing how to make friends and recognising that other people have thoughts and feelings are skills that we tend to take for granted, but as previously stated, in the case of people with ASD, these fundamental human

aptitudes are not automatically functioning (Howlin, 2003). There is evidence that shows that these skill deficits can be taught to children with ASD; indeed, studies have revealed improvements in aspects of social functioning, which include verbal and non-verbal communication (Williams, 1989; Howlin, 1997a; Mesibov, 1984).

An intervention technique that addresses Wing and Gould's (1979) "triad of impairments" is reported in the research literature and consists of programmes for social skills training groups (Marriage, Gordon and Brand, 1995; Mesibov 1984; Ozonoff and Miller 1995; Williams 1989). The rationale behind these types of interventions is that individuals with ASD are able to learn and practise essential social, communication and thinking skills; as well as basic skills such as eye contact, listening skills, turn-taking, body posture and timing, more advanced behaviours are focused on as a way of addressing the deficits in social understanding, communication and creativity found in ASD. Indeed, techniques that can help individuals with ASD to learn to greet other people, show an interest in them, pay compliments and develop friendships go a long way in addressing the social and communication deficits found in those with the condition.

In support of the above, the research literature contains several empirical studies of social skills training (SST) conducted with individuals who have been diagnosed with ASD (Marriage, Gordon and Brand, 1995; Mesibov, 1984; Ozonoff and Miller, 1995; Williams, 1998). Despite the benefits of addressing the fundamental core deficits of ASD, one of the most persistent weaknesses of SST research reported was an inability of participants to demonstrate

*generalisation and maintenance* of the social skills taught (Barnhill, 2002). In other words, the skills that are taught through SST do not generalise to a range of settings and are not maintained within the individual's repertoire of behaviour.

These findings have led Barnhill (2002) to state:

*"Groups that specifically programme for generalisation and maintenance and teach social skills in natural settings must be designed"*.

The above clearly indicates that she believes that for taught social skills to effectively generalise and become centrally established behaviours, they must be taught within an environment in which social exchanges normally occur and can be practised within an appropriate context.

In support of the above, Marriage et al, (1995) also considered that planning for generalisation was an important concept and to this end in their study they changed group leaders who delivered the teaching material, varied the rooms and buildings in which training took place; however, despite introducing a high degree of variability into the teaching situation the taught skills did not generalise to school, home or community situations. In view of these disappointing results the researchers recommended that in future all social skills training should be conducted within the natural or school setting, rather than in a clinic.

The present researcher accepts the views and findings of the workers cited above and had borne these in mind in respect of this present research study: indeed, as will be demonstrated later many of the ideas have actually been



tested and commented on; in pursuit of these goals the researcher carefully focused on a social skills training package that school-based staff were confident in using.

There are a number of social skills training packages available that show promise and one of these is discussed in detail in chapter 4; pupils and teachers who have taken part in programmes of this nature are complimentary about the games and clearly enjoy their participation in them. Teachers enjoy delivering the material and report improved behaviour in pupils and increases in confidence levels; whilst the information yielded from such reports is anecdotal and may have been due to a number of factors, such as, more attention and the security afforded by a structured learning environment, the underlying principle of addressing the deficits in attributes is nevertheless a sound one.

In conducting this research two key factors were considered important: the first was that the participants were in a structured teaching environment (albeit modified) where the delivery of teaching material was based on organised and visually presented material. The pupils were not expected to change in order to meet the needs of the school, but rather the teaching environment was modified in order to make accessing the learning objectives easier for the pupils so that learning occurred. Indeed, this is actually the essence of structured teaching (Mesibov and Howley, 2003); the second key factor was the introduction of the social skills training materials within a suitable learning environment that would allow the participants to rehearse and practise the target social skills contained within the programme. A crucial factor in this process was the opportunity for

the participants to reinforce the newly learned skills through *natural* social interaction.

## **A. THEORETICAL BASIS OF THE RESEARCH**

The research approach adopted by the current researcher owes much to the principles of learning theory and models of cognition within the context of ASD: these involve the development of processes, such as, knowing, thinking, learning, memory and imagination. Whilst these are attributes that are naturally acquired in non-autistic individuals, this does not automatically happen in individuals with ASD, who genuinely appear to perceive the world differently from their non-autistic peers: to account for these profound differences, three theoretical models of cognitive dysfunction in ASD have been advanced to shed light on the cognitive difficulties encountered by individuals with the condition.

One of the above models, is referred to as the “theory of mind” hypothesis and proposes that individuals with ASD are not able to perceive or comprehend the thoughts, feelings or intentions of others and therefore have what has come to be known as “mind blindness” (Leslie and Frith, 1987; Leslie, 1992; Frith *et al.*, 1994). A second body of work has focused on deficits in executive functioning; that is, difficulties that those with ASD experience in performing forward planning tasks and demonstrating cognitive flexibility: deficits such as these are reflected in difficulties with perseveration and a lack of the use of strategies in problem solving tasks (Prior and Ozonoff, 1998). A third area of theoretical research interest has centred on “central coherence” theory, in which the core

deficits in ASD are considered to arise from a basic impairment in observing meaning in whole arrays or contexts (Frith, 1996; Jarrod *et al*, 2000).

The theoretical models outlined above are discussed in more detail in chapter 2; they are considered to be important concepts in relation to this study and provide an empirical framework on which to base the ideas conceived by the author of this project: furthermore it demonstrates a rationale for linking cognitive models and treatment with the deficits expressed by individuals with ASD.

It is the current researcher's view that interventions based solely on models of learning theory cannot adequately address the difficulties presented by individuals with ASD.

### **A 1. Research Approaches**

The research approach used in this study comprised both quantitative and qualitative methods to analyse results: the former approach focused on numerical data yielded from a theoretical model that hypothesised that social skills training would improve the social functioning of individuals with ASD: in pursuit of this aim, the dependent measures were recorded in two phases (Time 1 and Time 2); this was done within the framework of a two-group experimental design.

The second approach was not numerical in origin, but instead was based on data gathered from the opinions of the participants concerning their likes and dislikes in relation to school, and whether or not these reflected aspects of



school-based systems or teaching practices: in doing this, the aim was to identify themes or patterns that could be controlled in order to improve the learning environment for all concerned. The data for this aspect of the research was collected using a Self-Report schedule which was administered to the participants; the instrument comprised 11 questions that were administered pre and post study.

Although less stress in the main text is placed on the qualitative research outlined above, the action taken in respect of the findings was highly valued by both the participants and school-based staff: indeed, some welcome changes were made to teaching practices and the learning environment that generally improved the performance and satisfaction of all concerned. The findings of the qualitative aspect of the research are discussed in Chapter five.

## **A 2. Research Aims**

The overall aim of this research was to investigate the effectiveness of social skills training for individuals with ASD, by measuring skills that were taught and practised within a school setting: this was done within the context of a modified structured teaching environment in a mainstream secondary school; although modified, the structured teaching strategies were judged to be successful in directing some aspects of participant behaviour; such as, attention, listening skills and levels of anxiety. In addition to the aforementioned, school-based staff considered that learning was also assisted, a view confirmed by Mesibov and Howley (2003) who assert this to be the case.

Despite the above, there is no evidence in the literature that indicates that structured teaching additionally brings about changes in the development of social behaviour, communication and normative life circumstances of children with autistic spectrum disorders (ASD). This being the case, this study was therefore an attempt to fill this gap, by systematically teaching human attributes that are not “spelt out” in the curriculum but are nevertheless essential for socialisation and learning in the broadest sense (Gresham, 1998).

Previous research using structured teaching and social skills training to improve the social functioning of individuals with ASD is virtually non-existent, although there are studies that have used social skills training (discussed later); there are good reasons for the paucity of studies of this kind in the literature and some of these are probably due to practical or systemic reasons, such as, a lack of knowledge in relation to ASD, finite resources, time constraints and unwillingness by some school-based staff to engage in a prolonged study that may have long-term implications in terms of resources.

As well as those previously referred to, the researcher recognised that a study of this nature could present significant methodological problems; for example, if children with ASD were homogenous in ability, behaviour and family circumstances, it would be possible to apply a uniform treatment or intervention package and measure change against a control group: in theory this could provide unequivocal answers to questions about treatments and outcomes; however, in reality both the characteristics and environments of children with ASD are in fact heterogeneous in nature and this creates significant problems when attempting to use standardised research methodology in order to address

questions about the impact of interventions or treatments with such diverse individuals. Despite these reservations, the current researcher was nevertheless confident that the framework within which the social skills training was delivered was sufficiently robust so as to minimise error.

## **CHAPTER TWO: LITERATURE REVIEW**

In the previous chapter it was pointed out that ASD could be treated in two ways; one was by applying conventional learning theories and the second by addressing deficits in development. An area of confusion that is important for researchers to consider is one that applies to behaviours that often occur in ASD. These consist of: poor eye contact, rocking, hand flapping, echolalia and resistance to change, although associated, are not exclusive to the condition (Happé, 1994). The application of any one of the above two models to ameliorate such symptoms may therefore amount to no more than treating anxiety, stress or fear in the individual, rather than addressing the core deficits of the condition; put more succinctly, focusing on Wing and Gould's (1979) "triad of impairments".

An explanation of the characteristics of ASD and the theoretical models of learning and cognition applied to improving the functioning and management of individuals with the disorder, are important concepts for an appreciation of research in this area. It is for this reason that the current researcher has described ASD in some detail, along with other important research and intervention strategies currently used in relation to the condition.

Autistic spectrum disorders (ASD) are profound and pervasive disabilities that affect almost all areas of an individual's functioning (Howlin, 2003); as previously stated, there is no known cure, although effective management and intervention techniques can considerably reduce or minimise the problems associated with the condition: despite this, the fundamental deficits will always remain, but can be better managed with appropriate strategies (Howlin, 2003).

## **A. FEATURES OF AUTISTIC SPECTRUM DISORDER**

The basis for ASD is neurobiological (Gillberg, C., Steffenburg, S. and Schumann, H. 1991), and although the precise mechanism has not been identified, children with the condition are at risk of developing seizures (Deykens and MacMahon, 1979; Volkmar and Nelson, 1990), which provides further support for a biological basis for the condition: although biologically or genetically based there is nevertheless a developmental aspect to the disorder and this accounts for differences in the ways that individuals express symptoms (Trevarthen, Aitken, Papoudi and Roberts, 1996). Apart from variations in the symptoms between individuals, the condition as a whole has a profound effect on essential human behaviour, such as: social interaction, the ability to communicate ideas and feelings, think creatively and form relationships with others.

Autism is not a new disorder and has been referred to in writings throughout history: for instance, a French doctor named Itard (1801), described a boy called Victor whom he studied for many years; Victor presented with very poor social and communication skills and had marked behavioural problems. From our current knowledge, it seems clear that Victor did have ASD and Itard's attempts to socialise him were therefore unsuccessful. Uta Frith (1989) also describes the "Blessed Fools" of Old Russia who were admired for their "unworldliness", apparent insensitivity to pain, strange and bizarre behaviour, innocence and a lack of social awareness, all of which suggest that these individuals also had ASD.



## **B. THE WORK OF LEO KANNER**

Although the literature is scattered with anecdotal accounts of what we now know as ASD, it was not until Leo Kanner (1943) published the first accepted clinical paper describing the features of the condition that it became a formally recognised condition; he provided a description of 11 children from his child psychiatric unit who were qualitatively different from those who had been described as having childhood schizophrenia. The children that Kanner wrote about in his original paper were described as having little interest in other people, disordered language, and an insistence on sameness.

Kanner's original description emphasised three areas of difficulty; social isolation, abnormal communication and an insistence on repetitive narrow routines. He described the characteristics of the children in his group in the following ways:

### **B 1. Extreme Autistic Aloneness**

The children did not relate to others normally and seemed happier when left alone: this poor social responsiveness appeared to begin very early in life and was revealed as the infants' failure to put their arms out to their parents (anticipatory behaviour) when about to be picked up; there was also a failure to contour themselves to the parent's body when held.

## **B 2. Obsessive Desire for Preservation of Sameness**

Kanner (1943) also noted that these children were very upset by change in their routines or surroundings and indeed any minor departure from the familiar would cause extreme distress: for instance, using a different route to school or moving objects in a room to an alternative place. Furthermore, the individual would not be comforted until familiarity was restored.

## **B 3. Excellent Rote Memory**

The children also often showed an extraordinary ability to memorise large amounts of information, which to Kanner, appeared to be meaningless material: this could relate to specific pages from an encyclopaedia or particular items or objects seen in books that were incidental or trivial to the overall aim of the material, but were obviously important to the individual concerned. This surprised Kanner, who did not predict these specific skills given the apparent learning difficulties that most of his children presented with.

## **B 4. Delayed Echolalia**

It was also noted by Kanner that the children often repeated language that they heard (echolalia), but did not use speech to communicate beyond their immediate needs; the echolalia was also associated with the reversal of pronouns which he remarked upon: for example, a child would typically use "you" when referring to themselves and "me" for the other person talking to them; this was the direct repetition of words that they have heard directed at

them from other speakers; in much the same way, individuals with ASD frequently echo the whole or part of a question instead of requesting something in the normal way. In fact, the exact form of words they use may have been heard hours or days previously: this so called "delayed echolalia" appears to be deliberately stored by the individual until he or she believes that it is appropriate to use it. So, rather than simply ask for a drink ("can I have a drink?") the child with ASD will recall the previously heard (learned) phrase, "Do you want a drink?." Not surprisingly, this is a situation that can cause a great deal of confusion for both the original questioner (who is tempted to say: "No thank you") and the child who expects to receive a drink but may not.

#### **B 5. Over-Sensitivity to Stimuli**

Many of the children that Kanner observed reacted strongly to particular noises and sounds, even though these were often common: for instance, the ringing of a telephone, the sound of a vacuum cleaner, toilets being flushed and sounds created during lunchtimes; the response shown by the child with ASD is often one of fear, but may equally be one of fascination, for example, fear may be shown as a response to a ringing telephone, whilst fascination with the noise of a vacuum cleaner. This is a puzzling phenomenon, but it is likely that children with ASD do not habituate as readily to harmless sounds as other children: however, the vast majority of individuals with ASD do eventually learn to cope with common sounds and situations. Kanner also observed that many children with ASD also showed similar responses to particular foods or textures: the individual would either show a strong aversion to or a fascination for certain

foods, such as, an intense dislike of bread, vegetables and meat, but enjoyment of crisps, yogurt and pizza.

### **B 6. Limitations in the Variety of Spontaneous Activity**

This is evident in the repetitive movements, verbalisation and preferred activities demonstrated by children with ASD: for example, many children will have elaborate movement routines (clapping hands, jumping, handling objects) without an apparent purpose; despite appearing to be purposeless (except perhaps for reassurance) these behaviours are repeated constantly. In fact, Kanner commented that the child often revealed great dexterity with objects and often appeared totally absorbed in what they were doing. The same limitations were also true of the child's verbal interactions that were noted for always being one-sided and obviously lacking in social engagement with others.

### **B 7. Good Cognitive Potential**

Kanner believed that the superior memory and dexterity shown by some of his patients with ASD, was an indication of higher intellectual ability: he held this view regardless of previous evidence that these same children were extremely limited cognitively. This impression of higher intellectual functioning being somehow "locked away" by the disorder is still a prevalent view held by some parents and teachers at the present time; in particular, the good memories of children with ASD can lead parents and professionals to believe that all that one needs to do is harness the memory skills into appropriate learning programmes and the individual will acquire knowledge normally. This idea is probably



reinforced by the physical appearance of children who have the condition, who are often athletic, attractive and appear alert and intelligent. This is unlike other categories of children with severe and complex learning difficulties, such as, Down's syndrome, profound developmental delay or Fragile – X syndrome where the child does not look normal.

## **B 8. Highly Intelligent Families**

Kanner (1943) commented that all his patients had parents of high ability: it is probably true that the parents within his population of patients were professional people who were high achievers; however, this was almost certainly the result of a highly selective referral system and his parents were not therefore representative of the general population. It is now understood that ASD can affect anyone across the social spectrum, irrespective of race or intelligence (Wing and Gould, 1979).

From Kanner's remarkably accurate description of autism, it is clear that his patients could not be described as simply having normal learning difficulties; in fact, a close inspection of his account reveals a number of peaks and troughs in the profiles of his group. For instance, excellent visual memories and dexterity often linked with very poor language skills and obvious learning difficulties; however, the real sense that one gets from Kanner's description of his patients is that they presented as being isolated and withdrawn and much more dependent on the environment rather than on people.



## **C. THE WORK OF HANS ASPERGER**

Another diagnosis that falls within the autistic spectrum disorder is Asperger's Syndrome: as the name suggests this category was named after Hans Asperger who was an Austrian paediatrician who began his work at the same time as Kanner; unlike Kanner, however, who lived and worked in the USA and wrote in English, Asperger wrote in German and published during the Second World War. It was for this reason that his work was not widely read by British and American professionals who had been the most influential investigators in the field of autism since its inception; in fact, it was not until Wing (1981) translated Asperger's paper into English and published it, that its significance was fully understood.

The definition of Asperger's Syndrome is similar to that of autism, with the individual possessing restricted interests (Mesibov and Howley, 2003); the difference is in the area of communication, where an individual does not have to demonstrate communication difficulties in order to qualify for a diagnosis. Indeed, part of the diagnostic criteria is that language develops at the normal time and the individual has average or above intelligence.

### **C 1. The Features of Asperger's Syndrome**

- 1. Autistic social impairment**
- 2. Clumsiness (usual but not necessarily present)**
- 3. "Concrete" or pedantic speech**
- 4. All absorbing circumscribed interests (usual)**

5. Lack of appreciation of humour (commonly described)
6. No significant delay in language development
7. No significant delay in cognitive development

## **C 2. Are ASD and Asperger's Different Conditions?**

Although categorised as an autistic spectrum disorder, Asperger's syndrome is often regarded as representing a different condition to that of autism: however, this is by no means certain and there is good evidence (discussed in more detail later) to suggest that both conditions represent the same disorder; the difference may be due mostly to a semantic dichotomy rather than a real one.

Wing (1981) was the first researcher in the English speaking world to use the term Asperger's syndrome (AS) when she realised that children with autism often made enough progress to be later categorised as having AS. Autism can be thought of as being at one end of a spectrum, whilst Asperger's is regarded as being at the other end. Mesibov and Howley (2003) describe the differences thus:

*"Another diagnosis that falls within the autistic spectrum is Asperger's syndrome (AS). The definitions of both conditions are similar: in fact, the social and restricted interests are identical; the difference is in the area of communication where a person does not have to demonstrate difficulties to qualify for the AS diagnosis".*

**Mesibov and Howley (2003) further comment:**

***“A dual diagnosis of autism and AS is impossible under the present systems; if a person qualifies for the diagnosis of autism, then the additional diagnosis of AS is not permitted. AS is, therefore, an ASD, which includes higher intellectually functioning clients with excellent language skills: they generally have more self-awareness than others on the autistic spectrum and also more subtle social deficits”.***

**Both conditions are considered to be developmental disorders that are defined by impairment in social relationships, deficits in both verbal and non-verbal communication that are associated with restricted and repetitive patterns of behaviour and interests. Mesibov G, and Howley, M. (2003) have summarised the main areas of similarity between the accounts of Kanner and Asperger thus:**

- 1. A marked preponderance of males.**
- 2. Social isolation and lack of empathy.**
- 3. Impaired communication skills (e.g. pedantry, abnormal delivery, stereotypical and repetitive utterances) and, above all, the failure to use speech for reciprocal conversational purposes.**
- 4. Impairments in non-verbal communication, notably eye gaze, gesture and facial expression.**
- 5. A lack of flexible and sociable imaginative play.**
- 6. Repetitive and stereotyped behaviours and resistance to change.**
- 7. Unusual responses to sensory stimuli, including hypersensitivity to noise and a fascination with the feel, taste or smell of objects.**

8. Gross motor clumsiness and abnormal gait in some cases.
9. Disruptive behaviours, including aggression, destructiveness and poor coordination.
10. Uneven patterns of development with many individuals showing particular skills in areas such as memory or mathematics.

Despite the similarities there are a number of differences, for instance, whilst many of the cases described by Kanner showed clear evidence of mental retardation, Asperger's cases were reported to be normal or of superior intellectual functioning; furthermore, whereas many of Kanner's cases had little or no speech, Asperger's individuals tended to have well-developed vocabularies that were often unusually good for their age and background (Howlin, 2003). Despite functioning well, the AS group were nevertheless unable to carry out normal social conversations and had profound difficulties in understanding abstract concepts, such as, jokes, sarcasm, irony and metaphor.

It was also reported that although many of Kanner's children tended to avoid social contact, those with Asperger's syndrome were often quite disinhibited and seemed unaware of boundaries (generally showed a lack of respect for the others): moreover, outcome in the two groups was very different; for instance, only approximately 11% of Kanner's cases were reported to have a good outcome in terms of later independence and social functioning (Kanner, 1973). On the other hand, Asperger cites a significant number of his cases in which his type of individual cases achieved high status professional roles in life: such as, university lecturers, biologists, mathematicians, chemists and high-ranking civil servants; he suggests that able autistic individuals are capable of outstanding



success because of their determination and single mindedness (see Frith, 1991).

Controversy still exists amongst professionals and researchers as to whether or not high-functioning autism and AS are really the same condition; as previously stated, AS is considered to be part of the autistic spectrum (Attwood, 1998; Tantam, 1991; Wing, 1998, 2000) with the major difference being related to symptom severity, with AS considered to be on the higher end of the autistic spectrum.

Some researchers suggest that there is little or no justification for using the category of Asperger's syndrome at all (Schopler, 1985); others have used the label to describe a range of different conditions that included autistic individuals of high intelligence and or language skills, those with relatively mild obsessional or social difficulties; atypical cases who do not fit the criteria for autism and even cases with "schizoid personality disorders" (Wolff and McGuire, 1995).

The National Research Council (2002) also point out that the large constellation of behaviours that define autistic spectrum disorders generally represent deficits in social interaction, verbal and non-verbal communication and restricted patterns of interest; however, distinctions among classical autism, atypical autism, pervasive developmental disorder and Asperger's syndrome are arbitrary and often associated with the presence of significant handicaps which include: mental retardation and severe language impairment (NRC, 2002).



Further evidence for AS and autism as representing one condition comes from a number of family studies that have found the co-occurrence of Asperger's syndrome and autism in the same family to be higher than expected by chance (Happé, 1994); in support of these findings, Bowman (1988) reports a family in which four sons and the father all exhibited varying degrees of autism, from very mild (which could be called Asperger's syndrome), to the most severe (Kanner's syndrome) where the autism was compounded by mental retardation. Similarly, Burgoine and Wing (1983) report a set of triplets who also spanned the range between Asperger's and classical Kanner; DeLong and Dwyer (1988) examined 929 first- and second-degree relatives of 51 children with autism and found a high incidence of Asperger's syndrome amongst the families of autistic children who were near-average in terms of IQ (>70), but not in the families of more handicapped.

A more recent study by Gillberg (1991) described the families of six individuals with Asperger's syndrome between the ages of 6 and 33 years: he found that two of the families had a first-degree relative who presented with autism; furthermore, Asperger's syndrome or traits could be identified in at least one first or second-degree relative of each of the children. In addition to this, across the six families he found that three of the mothers, four of the fathers, one brother and one paternal grandfather were affected by the condition.

Another reason for considering both Kanner's and Asperger's syndromes to represent one condition is the findings of a number of researchers: for instance, Ozonoff, Rogers and Pennington (1991) report a number of pre-school children who were initially diagnosed as having classical autism based on severe

language impairment and being very withdrawn and isolated, who subsequently made remarkable and rapid progress; in fact, these children developed fluent speech, no longer presented as being aloof and withdrawn and reached a level of functioning where support in a mainstream school became a viable proposition. Shah (1988) reports a number of cases in which major improvements in development justified a change in the diagnosis (autism to Asperger's syndrome) were not uncommon, and often occurred before the child had reached 5 years of age.

Although AS is now considered by many to be a milder form of autism, this does not mean that those diagnosed with the disorder are able to function well within social settings: the fact remains that AS is often an extremely disabling social condition (Tantam, 1991); skills deficits include a limited ability to take part in reciprocal conversations, poor understanding of unwritten rules of communication and an inability to exhibit appropriate social conduct. According to Elias *et al.* (1997), the impact upon individuals who have such deficits mean that they cannot demonstrate social and emotional competence, self-awareness, control over impulsivity, cooperative working and empathy towards others.

Robinson and Trower (1988) further argue that social behaviour is the most central and important characteristic of human beings: Gresham, Sugai and Horner (2001) add to this by contending that the ability to interact successfully with peers is one of the most important areas of an individual's development; furthermore, recent research (Church, Alisanski and Amanullah, 2001) indicates that social skill deficits remain the greatest challenge for intellectually able

individuals with AS. The impact of these deficits can range from not being able to maintain relationships to outright failure in employment due to a lack of understanding of the work place culture (Barnhill, 2002).

So far in this chapter the discussion has focused on Kanner and Asperger's syndromes and in doing so research and opinions have been quoted that considers these disorders to be a single condition: this view seems reasonable and indeed pragmatic, and simplifies ASD into a spectrum that ranges from mild to severe; this would be additional to the natural levels of functioning found in human development.

From a research perspective, the above distinction is important to establish, since it is crucial for the research validity that one understands the nature of the phenomenon being investigated; for instance, it is necessary to ensure that one and not two disorders are being researched (albeit at different levels). Whilst it would be an ideal situation to be able to research a homogenous sample of participants with ASD, this is just not feasible or even possible especially given the heterogeneous nature of those with the disorder. As was pointed out earlier, the distinction has important implications for interventions and one has to bear in mind the possibility of significant changes in status. Indeed, Ozonoff, Rogers and Pennington (1991) cite a number of pre-school children whose profiles changed from being classical autism to Asperger's syndrome within a relatively short period of time. The change of diagnosis was based on rapid improvements in language skills and the children becoming much less withdrawn and isolated. These reassessments raise a number of questions thus:

- 1. Can Kanner's and Asperger's syndromes be different if they are interchangeable?**
- 2. Were the changes caused by maturational factors in the children?**
- 3. Were the changes triggered by intervention strategies used with the children?**
- 4. Should general interventions be used regardless of diagnostic category?**

**The above questions cannot be answered satisfactorily without more information: they do nevertheless have important implications for intervention strategies, research design and the profiles of participants in this study; for example, should intervention strategies be broad enough in order to provide an umbrella for all children with varying degrees of symptoms? If so, this could prevent pre-judgements based purely on diagnosis and allow development to occur within an unbiased methodology; it also questions the notion of a diagnosis being set in "tablets of stone" and encourages a continuous assessment process.**

**The above is clearly important, because each individual with ASD possesses a peculiar profile that is unique to him or her; this is very much based on how the features of the condition are expressed (outlined earlier). Individual variations in participants can obviously influence the design and type of approach used to investigate a particular phenomenon.**



## **D. DIAGNOSIS OF ASD**

Wing and Gould's (1979) "triad of impairments" remains central to the diagnosis of autism, although there are often subtle variations or peculiarities in the three diagnostic areas; for instance, the term Pervasive Developmental Disorder (PDD) was created as an umbrella category for all those individuals showing such deficits or peculiarities. More recently the most preferred term is Autistic Spectrum Disorder (ASD): this is favoured by professionals because autism is central to the disability and therefore the term (autism) should be part of any phrase describing the broader syndrome (Mesibov and Howley, 2003); ASD is the term favoured by the present researcher and has been consistently used in this thesis.

Whilst Wing and Gould's (1979) set of three core impairments (triad) currently remain the basis for a diagnosis of ASD, these have been incorporated into two major instruments which are currently used by clinicians.

### **D 1. Diagnostic and Statistical Manual of Mental Disorders**

The first of the instruments is the: *Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV)*, American Psychiatric Association 1994.

### **D 2. International Classification of Diseases**

The second instrument is the: *International Classification of Diseases, 10th Revision (ICD-10)*, World Health Organisation 1993.



Both instruments are based on the three fundamental impairments captured by Wing (1979); copies of these are located in Appendix 2. One of these shows the diagnostic criteria for two previous systems of the Diagnostic and Statistical Manual (DSM): from these one can detect a greater clarity of description over time, which has now resulted in more rigorously constructed systems.

The other major diagnostic instrument referred to earlier is the ICD -10: this has been extensively adopted outside the USA; like the DSM-IV it has also undergone changes in recent years with earlier systems placing autism under schizophrenia. As a result both systems are now considered to be more consistent with each other in terms of identifying ASD.

From the above it is clear that the diagnostic criteria of DSM-IV and ICD-10 have evolved over time, and have moved closer to produce a more consistent diagnosis of ASD: despite this, there is still a considerable gap because there is no single instrument that treats autism and Asperger's syndrome as one condition; that is, children either have autism or Asperger's syndrome and this confusion also seems to be reflected in the fact that it is difficult to establish actual numbers of children with the condition in the general population. Indeed, some professionals only provide a diagnostic label of "communication disorder", whilst others use terms like "atypical" or Semantic-Pragmatic Disorder (Bishop 2000) when unsure as to whether or not a particular case is Kanner's classical autism or Asperger's syndrome. As previously stated the current researcher is content to use the term ASD and focus on appropriate interventions based on an individual's needs rather than rely on what appears to be potentially spurious

differences between Kanner and Asperger syndromes that could in some circumstances misguide treatment.

## **E. ESSENTIAL FEATURES OF ASD**

All conditions have a number of defining features, which are referred to as symptoms: these symptoms or core features have to be present in order make a diagnosis. In addition to symptoms, there may also be non-essential features present that in themselves are not sufficient to make a diagnosis. These extra features or behaviours include: poor eye contact, hand flapping and head-banging, which are often seen in children with severe mental handicaps who do not necessarily have ASD (Happé 1994); like the previous distinction referred to earlier (Kanner versus Asperger), this is important, because researchers could spend time investigating features that are not universal or specific to ASD.

In support of the above, epidemiological studies conclude that many symptoms shown by people with ASD are not specific: for instance, Wing (1971) found that more than 80% of children with ASD in her sample showed a preference for proximal senses (smell, touch and taste); this was also found in 87% of partially blind and deaf children, 47% of subjects with Down's syndrome and 28% of normal children. Moreover, since features such as language problems, stereotypical behaviours and severe developmental delays can be found in other non-autistic individuals: therefore they cannot in themselves be regarded as primary or sufficient causes of the problems seen in ASD (Happé' 1995).

The way in which the above can be tested, is by using control groups that contrast subjects with ASD and including children with the same level of general learning disability who do not have ASD; by matching groups for developmental levels or IQ, it is possible to attribute differences as being due to the subjects' ASD rather than other cognitive factors such as severe learning difficulties (seen in approximately 75% of children with ASD).

### **E I. ASD at the Behavioural Level**

Describing ASD at the behavioural level presents serious diagnostic problems: for instance, behaviours may simply occur together by chance and as such cannot be adequately described as a condition; on the other hand, a pattern of symptoms which cluster together in a consistent way can justifiably be described as a syndrome. Wing and Gould (1979) were important in establishing this in an epidemiological survey of all children living in the Camberwell area of south London. From a total population of 35000 all children aged below 15 years of age who were known to educational, social and health services were screened; these numbered 914 individuals.

The above sample was selected from the population if they had severe learning difficulties and or social impairment, verbal and non-verbal impairment and repetitive / stereotypical behaviours; the screening identified 132 children, all of whom attended special schools. The group was divided on the basis of social behaviour into 58 children with appropriate social interaction (for their mental age) and 74 socially impaired subjects; there were significantly more males in the socially impaired group as opposed to the social group.

In addition to the above findings, there were major differences in the communicative and play behaviours in the two groups: within the impaired group 90% of the participants were mute or produced echolalia compared with only 50% of the social subjects; also, 97% of the socially impaired group showed no symbolic play or only repetitive activities. In contrast, all the participants in the social group showed symbolic play (except those with language comprehension below the level when symbolic play would occur in normal children - below 20 months): on the other hand, all the socially impaired participants with language skills over 20 months, still showed marked communication problems and a deficiency of symbolic play (Wing and Gould 1978).

The conclusion of Wing and Gould was that all the children with social impairments had repetitive and stereotypical behaviour and almost all had abnormalities of language and symbolic activities; interestingly, the study revealed a marked tendency for these problems to occur together.

The above association between deficits in socialisation, communication and imagination was also found in a group of 761 adults in a mental handicap hospital (Shah et al. 1982): speech abnormalities were shown by 75% of those with social impairment as opposed to 14% with social interactional skills appropriate to their age; symbolic activity was lacking in 73% of those who were socially impaired, compared with only 14% for the socially able.

Clearly, the above findings show that impairments in social understanding, communication and imagination tend to occur in the same individual and do not



therefore arise by chance: in other words, the work of Wing and Gould (1978) and Shah (1982), show that a number of behaviours seen in children are universal and may occur in a range of problems; such as, emotional, cognitive or sensory difficulties. In contrast, problems in socialisation, communication and imagination are sufficient and necessary to capture much of the behaviour found to be specific and universal to ASD.

In terms of symptom expression, the triad of impairments just referred to can be illustrated thus: an individual with ASD may be unable to make eye-contact, use speech or gestures and have marked echolalia or he or she may have disordered but fluent speech and language skills; however, these significant variations although at the extreme ends of the autistic spectrum are nevertheless communication deficits. Likewise, the child who has a fascination for trains or cars but seems to handle them for tactile pleasure rather than using them appropriately in play activities (driving along a pretend road or a railway track), or the teenager who shows no interest in fashion or soap operas, but instead reads telephone directories or dictionaries is showing marked problems with imagination or creative thought; similarly, the individual with ASD will not make social approaches readily, but is prepared to talk incessantly (to anyone who will listen) about his or her obsessions, is displaying unusual or bizarre behaviour that is a consequence of his or her inability to understand social situations or norms.

As well as the core features, which all those with ASD have, there are many other characteristics that are typical but not universal: these include striking discrepancies on intelligence test batteries, where non-verbal ability often far



exceeds verbal skills; for instance, some individuals will score significantly higher than expected on tests that measure the reproductive aspect of visual-motor co-ordination; that is, on skills required to complete the Block Design sub-test on the Wechsler Intelligence Scale for Children (WISC-III). Those individuals who score particularly highly on this sub-test can be regarded as possessing very good perceptual- organisational and spatial visual ability (Shah and Frith, 1993). The interesting aspect of performance in these cases is that the results often bear little relationship to the individual's IQ: in other words, even those with below average intelligence may score at a superior level; as will be shown later these kinds of isolated skills do have a bearing on intervention strategies, because they reflect aspects of cognition that are important when considering how to help individuals with ASD.

It has previously been mentioned that many individuals with ASD show stereotypical or repetitive behaviours such as rocking, walking on tip-toes, hand-flapping or flicking their fingers in front of their eyes and so on: these are considered to be self-stimulatory behaviours (Happé, 1994) and others may include self-injury through hand-biting and head-banging; however, these types of behaviours can also be found in children who do not have ASD, but may be profoundly delayed (i.e. severe brain damage); more specific to ASD is the individual who exhibits an unusual degree of rigidity in terms of a wanting to "preserve sameness": that is, the individual who cannot tolerate even small changes in his or her environment, for instance, the individual who becomes extremely distressed when furniture or pictures are moved in his or her bedroom, or those who insist on wearing the same clothes constantly or taking

the identical route to school (even to the extent of crossing the road in the same place).

The important point about the above is that whilst the behaviours described are observable behaviours, they cannot of themselves fully explain the condition of ASD.

## **E 2. ASD at the Biological Level**

Although a great deal of research has been conducted into the biological basis of ASD, very little is understood about the actual areas or pathways within the brain that are damaged. There is nevertheless overwhelming evidence that there is an underlying organic cause of ASD (Coleman and Gillberg 1985, Schopler and Mesibov 1987, Gillberg 1991): indeed, in a study by Steffenberg (1991) it was found that 90% of her sample (35 individuals with ASD and 17 with ASD like symptoms) showed some evidence of brain damage or dysfunction; moreover, abnormal brain development that begins before birth shows its effect in behaviour only at the end of infancy when the child should be beginning to develop language (Steffenberg (1991).

Another indicator for brain damage in ASD is the very high level of epilepsy found in those with the condition: in a recent study of 192 individuals with autism, Volkmar and Nelson (1990) found that 21% had developed epilepsy; yet another indicator is the high incidence of general mental handicap, which is thought to account for about three quarters of all those with ASD (Happe' et al,

1996). Furthermore, as one looks at groups of individuals with progressively lower IQ's, the incidence of ASD increases (Smalley et al 1988).

### **E 3. ASD at the Cognitive Level**

Thus far, ASD has been presented as a set of impairments of socialisation, communication and imagination: these have been described principally in behavioural terms, the cause of which is biologically based; knowing that ASD is biologically based and represents a developmental disorder associated with a recognisable pattern of behaviours does not, however, inform us of the reasons or quality of the motivating thought processes behind it. Ultimately, a satisfactory explanation must come from a theory that defines the different cognitive mechanisms that underpin the behaviour; for instance, if a person deliberately crosses the road to greet a friend, an observer could describe the sequence of behaviours precisely. However, he or she could not adequately describe the behaviours in terms of recognition of a friend or strength of social response to that person (politeness, good manners or show of affection): in other words, an adequate explanation must encompass not only the motor responses (observable behaviour) but take account of perceptions (recognition) and cognition (thought processes) underlying the behaviour.

### **F. THEORY OF MIND**

One of the most influential cognitive models to emerge recently is the "theory of mind:" it has gained wide acceptance because it is a powerful theoretical model

that successfully predicts and explains the universal and specific features of ASD; although not absolute, it does achieves the following:

1. It generates ways of testing the theory
2. It gives a causal account
3. It explains the specific patterns of deficits and abilities seen in ASD.
4. It fits with what we know about normal development

The model was introduced by a research group (Baron-Cohen, Leslie and Frith, 1985) who proposed that children with ASD lacked a “theory of mind” and were therefore unable to understand or “read” the minds of others. So, in the example referred to earlier of a person crossing the road to greet a friend, their motive would not be understood by an individual with ASD: although the person with the condition would clearly observe the behaviours, he or she would not be able to interpret it because of a lack of understanding of mental states.

Accepting the above, the mere pleasure at seeing a friend or a simple desire to show friendliness would not register as a social act: in other words, the individual with ASD cannot infer such concepts as desires, beliefs, needs, intentions and empathy to others: indeed, this ability underlies much of our interaction with others, which in turn influences our behaviour towards them. This “mind blindness”, as Baron-Cohen (1990) referred to it, was the proposed basic deficit that affects normal cognitive development in those with ASD: this in turn is responsible for the complex surface behaviours seen in the condition.



The “mind blindness” concept was tested using an experiment that was designed to reveal the characteristics that would need to be associated with people understanding the minds of others: as such, it was stunning in both its simplicity and elegance; it is now famously known as the Sally / Ann test and was designed in 1985 to test the prediction that children with autism would lack the ability to understand beliefs. The experiment was conducted thus:

1. A group of children with autism having mental ages of above four years
2. A control group of children with Down’s syndrome who also had mental ages in excess of four years.
3. A group of normally developing 4 year old children.

In the Sally / Ann test, Sally and Ann are represented by two dolls: Sally has a basket and Ann has a box; in the story, which is acted out in front of the testee, Sally places a marble into her basket while Ann is watching. Sally then leaves to go for a walk (leaving her basket behind): whilst she is away, Ann places Sally’s marble in her own box (hidden from view); when Sally returns from her walk, she wants to play with her marble. Having witnessed the swap, the testee is asked, “Where will Sally look for her marble?” The correct answer is of course in the basket, which is where Sally left it and believes it remains. Children with autism will, however, answer “In the box”, because that is where the marble actually is.

In the above test, Baron-Cohen et al (1985) actually found that 80% of children with autism failed to appreciate that Sally would function according to a false belief (that the marble was still in the basket): rather, they said that she would



look in the box (where the marble really was); whereas 86% of the Down's syndrome and normally developing children did appreciate Sally's false belief (as most normal 4 year olds would).

The discrepancy reported above of 80% of children with autism failing to infer mental states to others as demonstrated on the Sally / Ann test and the 20% who apparently can, indicates that the "theory of mind" does not represent a precise cognitive model of ASD: however, the 20% success rate has been explained by research evidence that suggests that there is a strong relationship between verbal ability and "theory on mind" capacities (Ozonoff et al, 1991). In other words, those individuals who have reasonably well developed verbal skills are more likely to possess some level of understanding into the minds of others.

Despite the discrepancies between the less verbally gifted and the more able individuals with ASD, it is clear that those with the disorder do have specific and unique problems understanding that people have mental states, which can be different from reality (a false belief) and different from their own mental state: in the case of Sally a belief concerning the whereabouts of a marble. The ASD group in the Sally / Ann test knew where the marble was and assumed that Sally shared their knowledge: the group with autism did not understand that Sally's knowledge was different from theirs and based on her own prior knowledge of the situation (the marble was in the basket when she left).

Individuals with ASD have been found to fail other false belief tasks: in a variation of the Sally / Ann test Perner, Leekham and Wimmer (1985) conducted a study in which children were asked to guess what was inside a

closed Smarties sweet tube. Having replied “sweets” or “Smarties” the tube is opened to reveal the actual contents, which, was in fact a pencil in the test. The lid was then replaced on the tube and the child was asked:

*“When Simon comes in, I am going to show him the closed tube, like I did with you, and ask him to tell me what he thinks is inside the Smartie tube. What do you think he will say?”*

In this task, which normal 4 year old children can pass quite easily, those with autism, however, fail to recognise that Simon will have a false belief and maintain that Simon will declare a pencil to be in the tube because that is what they saw.

Although the “theory of mind” appears to have some limitations, it nevertheless has important implications and allows predictions to be made that reflect the clinical findings of autism (Frith, 1989); it not only explains deficits, such as false beliefs, but also those functions that are likely to remain intact. These include any skill that only requires primary representation, such as, a good memory for cars or words. This means that it only requires an individual to comprehend things as they really are in the world (objects and symbols): on the other hand, those that require pretence or metarepresentations, such as, the interpretation of a child using a banana as an aeroplane, cannot be grasped because it involves the use of an object that is normally eaten (a banana) as a mental representation of something else (an aeroplane). Leslie (1987, 1988) hypothesised that individuals with autism who show impairment in spontaneous pretence, have a specific impairment in forming metarepresentations. Moreover,

these are necessary for more than just pretence, they are vital for representing other “informational relations” or “prepositional attitudes” (mental states) such as “think”, “hope”, “intend”, “wish” and “believe” (Happé 1995).

The “theory of mind” explanation of ASD has also allowed researchers to make what have come to be called “clear cuts” in what appeared to be very similar behaviours: for instance, Attwood, Frith and Hermelin (1988) showed that the well recorded absence of gestures from individuals with ASD only applied to those gestures that influence mental states; on the contrary, they showed as many gestures aimed at manipulation (e.g. approach or go away) as control subjects with severe learning difficulties.

Similarly, Baron-Cohen (1988a) found that individuals with ASD were impaired in their use and understanding of pointing for the sake of sharing attention (protodeclarative pointing), but not when they used pointing in order to get a desired object (protoimperative pointing): This degree of distinction could not be explained by theories of emotional or motivational behaviour and has important implications for intervention strategies (discussed later).

The inability to form metarepresentations and the consequent inability to understand or predict the mental states of self and others would certainly have significant effects on the behaviour of those with ASD: indeed, the triad of impairments could be due to an inability to mentalise (Frith, Morton and Leslie, 1991); likewise, social impairment would follow from the lack of “theory of mind” and serious communication deficits would result from an inability to represent intentions or recognise utterances as reflections of a speaker’s thoughts.

## **F 1. Implication of “Theory of Mind” Deficits**

Amongst the effects of “theory of mind” impairment could be the following:

- **Difficulty in predicting the behaviour of others leading to a fear and avoidance of people: this would lead to a preference for activities that did not depend on people.**
- **Difficulty in understanding the emotions of both others and self: this would be expressed as lacking empathy.**
- **Difficulty understanding that behaviour affects how others think or feel: this results in a lack of conscience and motivation to please.**
- **Inability to deceive or to understand deception: this means that the individual cannot understand jokes or pranks and is very literal in his or her comprehension.**
- **Poor understanding of social interaction, leading to difficulties with turn-taking, inappropriate use of eye contact and restricted levels of conversation.**
- **Difficulty in understanding “pretend” and differentiation of fact from fiction.**

The difficulties that arise from “theory of mind” impairment clearly affect an individual’s ability to interact socially at home, school and in the wider context of the environment generally: moreover, they influence behaviour, thought and the normal educational processes aimed at developing preparedness for independent living.



## **G. CENTRAL COHERENCE**

It has been suggested by Uta Frith (1989), that not all aspects of ASD can be explained by “theory of mind” impairment alone, such as, insistence on sameness, segmentation (attention to detail rather than the whole), insistence on routine and obsessional preoccupations. She points out that children with ASD often perform better than expected on such tasks as the Children’s Embedded Figure Test, Object Assembly and Block Design; the latter two are subtests on the Wechsler Intelligence Scale for Children (WISC-III).

Frith (1989) argues that the skills referred to above are due to serious difficulties that individuals with ASD have in perceiving wholes (e.g. line drawing of a bicycle) and instead demonstrates an ability to see the constituent parts over the whole; she is not the first to comment on this and Happé (1994) points out that Kanner (1943) describes one of the universal features of autism as an “inability to experience wholes without full attention to the constituent parts”. He had also commented on the tendency for fragmentary processing and the children’s resistance to change a situation, performance and sentence (because it is not made-up of exactly the same elements when first encountered).

Frith (1996) describes “central coherence” as the tendency to draw together diverse information to construct higher-level meaning in context; put simply, in individuals who process information normally there is a tendency to make sense of a situation according to the context in which the events occur: in those with ASD this does not happen and the individual will not perceive a line drawing of a pram or bicycle as examples of functional objects, but rather as shapes that



contain pleasing examples of triangles which are more meaningful to them. An individual with weak “central coherence” who is told to take his or her feet off the desk will insist that they are on their legs: likewise, a request to take their book out is likely to be misinterpreted as a request to literally leave the classroom with the said book.

## **G 1. Behavioural Implications of Central Coherence Deficit**

- The individual will not be able to focus on relevant school-based tasks.
- The focus of interest of the pupil will determine what he or she learns.
- An inability to comprehend the actions and communications of others will result in an individual adhering to established routines.
- The pupil will not be aroused by new ideas and develop creative ones.
- The pupil will not be able to prioritise and organise important goals.
- The pupil will not be able to generalise knowledge and see connections.
- The pupil will not comprehend the need for learning and this will lead to non-compliance.
- The pupil will be unable to integrate or co-operate in group situations.

## **H. EXECUTIVE FUNCTIONING**

Luria (1966) described executive functioning as:

*“The ability to maintain an appropriate problem-solving set for attainment of a future goal”.*

The above definition was also given by Ozonoff (1995) in a paper in which she proposes that the central deficit in ASD is in executive functioning. Executive functioning is mediated by the frontal lobes of the brain: this is considered to be an area involved in the construction of mental representations or internal models of behaviour or reality (Goldman-Rakic 1987); the behaviours under the control of executive functioning include the following:

- Planning
- Inhibition of correct / incorrect responses
- Self-monitoring
- Behavioural flexibility
- Organised search
- Set maintenance and change

Ozonoff (1995) maintains that it is the above functions that are impaired in individuals with ASD and this does reflect the behaviours seen in those with the condition: these difficulties include impulsiveness, inflexibility, difficulty with control and inhibiting or holding back responses; the individual may have a large store of knowledge but experience difficulty applying it in an organised and meaningful way.

## **H 1. Behavioural Implications of Executive Functioning Deficit**

1. The individual has difficulty perceiving emotions because he or she cannot hold images of different forms of expression internally; the individual with ASD is therefore guided by the external appearance of a person's face and

can be confused by subtle differences expressed by different emotions: for example, an open mouth to express surprise, fear or joy can be confused because of a dominating perceptual pattern (open mouth).

2. Similarly the individual also experiences difficulties with imitation because he or she cannot hold an image of another person's behaviour internally long enough to copy it.
3. The individual also experiences problems with pretend play for the same reason: that is, he or she cannot hold the image of external objects in mind long enough to represent them as something else (banana as a telephone).
4. Individuals with ASD have problems with planning a task; this is because they cannot understand that a sequence of steps leads to an outcome: therefore, planning a sequential task, such as, mixing the ingredients of a cake and baking it using appropriate timings and temperature controls, would represent an extremely challenging undertaking.
5. The individual experiences difficulty with starting and stopping tasks: this relates to (4) above in that the individual does not have a clear understanding of outcomes for tasks and cannot therefore envisage a start or finishing point. Instead he or she does nothing.

For the researcher, understanding ASD at the biological, behavioural and cognitive levels provides an important insight into understanding the condition from the perspectives of those with the condition, more importantly it suggests

powerful and effective interventions. Given that ASD represents a neuro-developmental disorder, drug interventions are unlikely to be effective, except for treating associated conditions such as epilepsy.

A behavioural explanation can provide the basis for a diagnosis and Kanner's (1943) description of "autistic aloneness" and an "obsessive desire for the preservation of sameness" provided insight into important behavioural features of autism that eventually led to Lorna Wing's (1978) "triad of impairments".

Providing an explanation of ASD at the cognitive level makes the condition accessible to hypothesis testing: it also allows researchers to make predictions that can then be tested; the Sally-Ann task (Baron-Cohen et al, 1985) described above is a good example in which a prediction was made based on a theoretical model (that children with autism lacked a "theory of mind"). The hypothesis was tested and did indeed fit with observational data.

For the current researcher a cognitive explanation of ASD has provided not only an opportunity to re-evaluate a potentially powerful intervention, but to also retain the best elements of an already approved technique such as TEACCH. An intervention strategy that avoids ambiguity in its presentation, organisation and delivery of learning material reduces the need for planning on the part of the pupil: the use of visual cues to highlight meaning enables the individual to generalise his or her knowledge and also ensures that attention is drawn to cause and effect.

On the other hand, cognitive theories such as “Theory of Mind,” “Central Coherence” and “Executive Functioning” signal the need to use intervention techniques that address the underlying deficits predicted by these models: using this logic social skills training would appear to contain the potential to help those with ASD to develop mechanisms by which they may gain insight into the thoughts and feelings of others and as a consequence, develop the ability to share experiences.

## **I. INTERVENTIONS FOR ASD**

The most extensive interventions delivered to pupils with ASD are either based on developmental or behavioural models: these are favoured because they are structured and lend themselves to quantitative appraisal; it is for this reason that a large number of research and clinical groups have adopted these approaches. Examples include: Lovaas (1987) at UCLA, Howlin and Rutter (1987) at the Maudsley hospital in London and Schopler, Mesibov and Baker (1982) at Division TEACCH (Treatment and Education of Autistic and Related Communication Handicapped Children). Interestingly, most models of intervention started as research programmes (Harris and Handleman, 1994; Handleman and Harris, 2000; Dawson and Osterling, 1997; Rogers, 1998), in which empirically demonstrated strategies for addressing specific programmes were gradually packaged as components of overall clinical models and in this respect the interventions have a sound theoretical basis.



## **I 1. Developmental Models**

Developmental interventions seek to identify deviance in individuals from normal pathways of development and apply corrective measures in the form of intervention strategies: the assumption is that a child's developmental symptoms reflect unique biologically based processing difficulties that involve affect, sensory processing and modulation, motor planning and symbol formation (Greenspan and Wieder, 1997). Relationships and affective interactions may go awry because of these processing difficulties and providing effective intervention will help the child to re-establish normal interactional patterns.

## **I 2. Infant Development Programme**

This is an example of a developmental approach and is based on an idea by Dawson and Osterling (1997) who put forward the notion that early intervention for children with ASD became necessary as diagnosis is made earlier. Their programme is based on studies in which interactive aspects of children with ASD were assisted by carefully designed programmes: they point out that imitation of the child serves to put him or her in control of an interaction and that this makes the whole sequence of the interaction more salient and predictable for the individual. Moreover, it enables the child to regulate the interactional process in terms of stimulation to be dealt with, so that he or she is not overwhelmed or confused, which could lead to distress and withdrawal of co-operation. They further claim that because such simple interactions are developmentally appropriate to the socially and emotionally delayed child, it

also produces a meaningful and pleasurable experience which leads to a sense of shared emotion.

The characteristics of the programme are given by Dawson and Osterling (1997) as:

- Modelled on early social interaction and facilitated through play.
- Based on typical developmental sequences
- Incorporating “scaffolding” (the normal developmental process whereby adults structure interactions to facilitate the child’s contribution), but augmented by exaggeration and simplification
- Sensitive to a narrow range of optimal stimulation
- Having the child as the initiator

The goals of the programme are thus:

- Self regulation of arousal
- Shared affect with carer and shared attention with carer
- Promotion of social play through ritualistic games
- The acquisition of communicative intent

The overall aim of the Infant Development Programme is to enhance early social, emotional, cognitive and communication development in young children with ASD: the intervention is delivered in a special nursery setting and or the child’s home; there are considerable training implications for both professionals

and parents, with the latter often being the sole participants. Assessment of progress is based on video analysis of the child's interaction with others.

There is research evidence for some of the principles underlying the above approach: a study by Dawson and Adams (1984) found that the quantity and quality of social responsiveness in children with ASD improved considerably when strategies were employed that followed the child's lead. Lewy and Dawson (1992) also found that children under 6 years of age spent more time socially engaged when adult play behaviour closely followed and was contingent on their own behaviour: however, studies on interactive techniques have been criticised on the grounds that the assessment of actual gains against a statistical calculation of projected gains is often made thereby avoiding the use of a control group (Jordan, Jones, and Murray, 1998). Furthermore, the aforementioned authors maintain that some children in these studies have not met the diagnostic criteria for ASD; nor scored as having the disorder on the Childhood Autism Rating Scales (CARS).

### **1.3. Behavioural Approaches**

Behavioural approaches have undoubtedly had a significant impact on the education and management of children with ASD for the last three decades (Howlin and Rutter, 1987a; Short, 1984); indeed, these techniques have been widely acknowledged as playing an important role in the reduction of behavioural difficulties and in the improvements in social and communication functioning in those with ASD. However, until recently behavioural interventions

were regarded as techniques that ameliorated the deficits seen in ASD rather than bringing about a “cure” (Howlin, 2003).

The view expressed above was challenged by Ivar Lovaas (1989), who published a paper that reported dramatic outcomes for a study that he had conducted: he used a group of 19 pre-school children who received intensive home-based behavioural programmes for 40 plus hours each week for over two years; their progress was measured at 7 years of age and compared with that of a less intensively treated control group who received 10 hours or less of interventions each week. At follow-up the experimental children were found to have gained and maintained 20 IQ points.

Lovaas and Smith (1989) based their techniques on the notion that human behaviour is learned and governed by its antecedents and its consequences: children can therefore learn new skills by carefully modifying stimuli and providing immediate reinforcement. This is based on Skinnerian operant conditioning that maintains that learning can be reduced to the repetition of responses that in the past have been rewarded. On the other hand, the elimination of unwanted behaviours occurs through the process of punishment: skills are acquired by rewarding successive approximations to the desired behaviour.

The Lovaas programme uses tangible rewards which are mostly edible and desists from applying punishment beyond a shouted “No!” for incorrect responses; the programme emphasises teaching in small steps, rewarding, giving clear instructions, prompting, shaping and fading: in this way skills are



built-up in discrete steps that make use of forward and backward chaining techniques (Ainscow and Tweddle, 1984), rather than larger and more complex multiples.

The child is taught new skills or behaviours during a number of drills; these drills are carried out for 10 to 15 minutes, after which, the child is given a period of play: this procedure is repeated with another 10 to 15 minute work session using a drill to teach new target behaviour; for example, sitting quietly, listening or looking at the teacher; a command is given such as "sit quietly" followed by a positive reinforcer (favourite activity or a crisp). If the child engages in unacceptable behaviour (hitting or shouting out) he or she is ignored but will lose privileges as a consequence of the unacceptable behaviour.

Verbal and physical cues are used in working towards mastery of the skill: once the behaviour is achieved, accuracy and fluency measures are used to ensure mastery: in other words, the child has to be able to demonstrate that he or she can respond correctly to a preset criterion, such as, when asked to sit quietly does so 9 / 10 times. Generalisation is regarded as having been achieved when the child can demonstrate the skill in new situations with different individuals.

Although Lovaas makes extraordinary claims for his methods, one should remember that his sample was very small and confounding factors may have been operating that influenced the outcome: for instance, did all 19 children actually have autistic spectrum disorders? Indeed, Connor (1997) himself uses the term "recovered" to imply a cure; he also maintains that those children most likely to benefit from intensive behavioural interventions modelled on the Lovaas

principles are those diagnosed as having mild to moderate autism and who begin therapy before the age of 3.5 years of age. On this basis, it may have been the mildness of the autism that produced the research findings rather than the ABA model (Gresham and MacMillan, 1997a; Jordan, Jones and Murray, 1998; Rutter, 1996; Schopler, Short and Mesibov, 1989).

#### **14. TEACCH Programme**

TEACCH (Treatment and Education of Autistic and related Communication Handicapped Children) is one of the most widely used approaches for ASD (Jordan, Jones, and Murray, 1998); it does not make extravagant claims about cures, but instead works with the condition rather than actively trying to change it. It is a popular approach and its reported effectiveness is due to a number of factors which are aimed at enabling pupils to access teaching material more effectively: these include providing structure within the teaching environment with an emphasis on the visual processing of information, rather than the more traditional approach of delivering knowledge verbally, which is considerably more difficult for individuals with ASD to access.

TEACCH is designed to be a client centred programme that is structured around an assessment protocol; as such, it focuses on the strengths and weaknesses of individuals and takes these into account when constructing appropriate Individual Educational Plans (IEP's) to improve learning and hence performance.

## **I 5. Structured Teaching**

Within the framework of TEACCH strategies, the concept of Structured Teaching was developed on the basis that autism was a developmental disorder rather than an emotional one based on poor parental management, ambivalence or rejection. As a developmental disorder, ASD needed a strategy that would allow children with unusual ways of processing the environment to gain access to educational practices that would suit their cognitive styles or ways of thinking, understanding and learning. Structured Teaching is designed to address the major neurological differences seen in children with ASD, but as previously stated does not attempt to change behaviour directly; instead it makes changes in the teaching environment that allows individuals to access learning material more effectively (Mesibov and Howley,2003).

A specific example of the way in which the use of Structured Teaching is applied to the amelioration of problems related to understanding language is by providing visual material (pictures on cards) to accompany a particular verbal message; for instance: "Go to the toilet and wash you hands." This two-part verbal request would be delivered together with a picture of a toilet and a sink to enhance the understanding of the individual. Unfortunately, comprehension difficulties may not always be apparent because not infrequently individuals with ASD present with quite good non-verbal skills that tend to mask their lack of understanding: this in turn affects the individual's ability to initiate action in responses to the verbal requests of others and engage in meaningful communication.

**As in the case of receptive language difficulties, those with ASD may also have expressive language problems that can equally affect their ability to initiate, organise and comprehend (most of us think before we reply to questions) and this can be a major obstacle to even asking simple questions. Again, the degree of inhibition that the individual may experience is often misunderstood because he or she may otherwise demonstrate relatively good non-verbal skills; the fact remains, however, that the lack of linguistic skills greatly disadvantages those with ASD in terms of learning, socialisation and the development of communication skills.**

**The attention and memory skills of individuals with ASD can also be different from non-autistic individuals: for example, many children with ASD can recall specific details (e.g. patterns on ties, colour and makes of cars, details of machinery and places visited), but experience significant problems with working memory; the ability to process several chunks of information at the same time is often impaired. Moreover, they may experience difficulty attending to the most relevant aspects of a situation or verbal exchange presented to them; this can also be a source of considerable frustration and distress.**

**Organisation is another major challenge for people with ASD: this applies to both the organisation of material and activities in space and time; however, processing is made easier if the materials are familiar rather than novel. Indeed, there is a strong preference on the part of individuals with ASD to repeat activities and routines previously experienced; in fact, this probably appeals to their natural desire for the preservation of sameness.**



Other natural challenges experienced by those with ASD relate to dealing with other people and coping with sensory stimulation from the environment; individuals with ASD do not possess the natural skill of being able to understand the ideas, motives, behaviour and beliefs of others and are greatly disadvantaged when it comes to anticipation in a two-way exchange. To complicate matters further, interactions take place within the framework of subtle and complex social rules; for instance, if one cannot anticipate a friendly smile (assuming one knows what a friendly smile is), one cannot prepare an appropriate response (return the smile). This apparently simple act also requires an ability to time the interaction correctly and deliver an appropriate level of eye contact; the difficulties encountered by individuals with ASD in understanding social rules can lead to attention seeking behaviour and social withdrawal. The lack of social relatedness can make the efforts of others to motivate and direct the behaviour of the person with ASD extremely difficult.

For those with ASD, sensory stimulation can be particularly distracting and they can often over react to stimuli from environmental sources; for example, telephone rings, lavatory cisterns, machine noises, swaying trees and bushes, moving vehicles and reflections. The individual being stimulated appears unable to inhibit or modulate the stimuli and as a result learning can be interfered with; the stimulation may be obviously aversive or pleasurable (causing behavioural problems or an intense preoccupation with the stimulus) but remains a barrier to learning.

Structured Teaching helps because it provides a framework in which the classroom is organised in a way that allows the curriculum to be delivered in a

**precise and consistent way: teaching goals are made clear and the material is student-specific; in effect, the programmes contain teaching material that is based on the student's needs (deficits and interests) rather than on a theoretical model of social and cognitive normality (Mesibov and Howley, 2003). As previously stated, many individuals with ASD have extremely good visual skills as opposed to auditory skills; for these pupils (also previously mentioned) teaching material can be presented visually (pictures or words) and this makes information more meaningful and reinforces learning by using the individual's strengths; the opposite would be the case if verbal information was delivered to an individual with serious attentive and or comprehension problems.**

**According to Mesibov and Howley (2003) the main purpose of Structured Teaching is to increase a person's independence, manage his or her behaviour and improve learning by utilising the cognitive skills and interests of the student.**

**The following four elements are incorporated into Structured Teaching:**

- 1. Physical Structure**
- 2. Daily Schedules**
- 3. Work Systems**
- 4. Visual Structure and Information**

### **Physical Structure**

**For the pupil with ASD the physical organisation of the classroom represents an interesting and non-threatening environment: for the teacher and support staff it is a prerequisite to learning that takes account of pupil differences in terms of**

**deficits and strengths: this is achieved by careful planning of the environment so that each individual has a clear understanding and expectation of what each element or area within the classroom represents.**

**Not every pupil with ASD will require the same degree of structure within the teaching environment: for the less able a highly structured and self-contained environment will be the most appropriate: the use of consistent, visually clear areas and boundaries for specific activities enables the pupil to better understand his or her environment in terms of relationships between events: for example, a specifically designated area for each major activity will generate an expectation when the pupil is in that particular location. So, whenever he or she is sent to that spot the pupil adopts a particular attitude; if the area is one in which learning is the norm (an expected activity) the pupil will automatically assume a work mode. If on the other hand, the pupil is sent to the play area he or she will be ready to engage in some rough and tumble or practise an activity related to symbolic play.**

**An eating area not only provides an opportunity to eat and drink, but to take part in social activities and to learn table manners; it also presents an opportunity in which the individual can practise his or her turn-taking skills, develop his or her timing of interactional processes and engage in general communication. A fourth location is referred to as a transition area and is where the child attends to receive a different task; this area provides a clear signal that another task is about to begin. This is the equivalent of a pupil in a normal school setting starting another lesson on the timetable.**

## **Daily Schedules**

These are often presented in the form of sequenced pictures that depict what the pupil is required to learn: for instance, at a simple level this may be pictures of clothes to assist the individual to learn in which order to dress thus:

1. Vest
2. Under-pants
3. Shirt
4. Trousers
5. Socks
6. Shoes

At a more complex level the pictures may be replaced by words or instructions that provide precise instructions within the context of a particular sequence that shows what is to be completed as part of a lesson, project or a long-term assignment.

## **Work System**

These help to organise each specific activity that the pupil is required to undertake: they are critical in helping an individual to develop independent work skills in the absence of adult assistance or direct supervision (Mesibov and Howley, 2003). Work systems convey four chunks of information for pupils:

1. What work they are required to complete



2. How much work is to be done in a specified time.
3. Information about progress and when the task is finished.
4. What they should do after the assignment has been completed.

As can be seen work systems are structured in a way that informs and carefully directs the pupil towards task completion with little or no adult support; they appeal to the pupil's needs for consistency and routine without posing a threat.

### **Visual Structure and Information**

This is a major strategy that is based on the difficulties that pupils with ASD have in relation to learning: it makes use of the fact that verbally presented learning material is less acceptable and exploits the individual's natural tendency to respond to a visual approach to learning; the example of learning to dress outlined above, is a simple example of a visual approach, an advanced example might entail learning about other cultures through the use of television and videos.

### **Evaluation of the Research on TEACCH**

Although TEACCH is one of the longest established programmes with an international pedigree, there has been a surprising paucity of work on evaluating the programme in terms of effectiveness: some of the outcome measures reported have not been systematically researched and do not contain the details necessary for a convincing evaluation. Mesibov (1997) reviewed formal and informal evaluative measures and reported that there was research

evidence for the rationale of the approach and a high degree of parental satisfaction with it; although he also acknowledged that this did not constitute scientific evidence.

In an early study Short (1984) did a systematic evaluation and used children as their own control in a baseline design; he included an unspecified comparison group who had not received TEACCH intervention and reported improvements in appropriate behaviour and communication in a group that had undergone the TEACCH programme. Likewise, Lord and Schopler (1989) report a follow-up of 50 children who were exposed to a TEACCH programme that had used pre and post non-verbal intelligence as measure of change: the results showed substantial changes in IQ scores over a period of four or five years; with the three year olds increasing their scores by 22 to 24 points over a four year period and the four year olds doing so by 15 to 19 points over a five year period. Whilst these findings do show increases in IQ for this group, this cannot be regarded as conclusive evidence that this is attributable to the TEACCH programme; indeed, maturational factors and improvements in language skills could also account for the data as could practise effects.

Ozonoff and Cathcart (1998) conducted a well-matched study of 22 children, 11 of whom had parents delivering a TEACCH programme at home, whilst the other 11 served as no-treatment controls. All 22 participants were also in a day or pre-school setting and exposed to discrete trial learning programmes as advocated by Lovaas. Although the study made no direct comparison with the Lovaas style ABA and TEACCH, the ABA programme was acting as a baseline

for the performance of both groups: the results showed a significant difference in favour of the TEACCH group in the following four skill areas:

- Imitation
- Fine motor co-ordination
- Gross motor co-ordination
- Non-verbal communication

The experimental group scored 3 or 4 times the rate of development compared to the control group; however, there was independent rating for the assessment of progress and no control for the intensity of parental involvement and in this respect the study was somewhat flawed.

## **1 6. Social Stories**

Social stories were developed by Gray (1994) as a technique by which children with ASD could be helped to develop their social skills: as the name implies, the method employs short stories of between 20 – 150 words to inform and advise the child about a social situation; according to those who favour the approach, it feels natural to parents, teachers and others who use it because it is a relevant skill that they already have, but when used in a focused way can enhance the child's social behaviour and understanding. Moreover, the stories can be specifically designed for difficulties that the child is experiencing and they focus on real-life situations. Smith (2001) points out that they also include aspects of good practice in ASD. The stories are:

- **Visual (i.e. they are presented in the written form and can contain developmentally appropriate photographs, charts, drawings or diagrams).**
- **Permanent (i.e. they allow the child to re-visit the same story until he or she can demonstrate the skill being taught).**
- **Written in simple language, reflecting the child's language levels and current vocabulary.**
- **Based on careful assessment of the child (i.e. the story is informed by observations of the child, discussions with the child and identified needs as gathered by those who know the child best).**
- **Focused on an area of core need (i.e. social interaction and communication).**
- **Factual, offering the child information about who is doing what, and why.**
- **Unusual in focusing directly on what people are thinking and feeling, and how that relates to their behaviour (i.e. adding to the child's "theory of mind").**
- **Situation specific.**
- **Written in a predictable style to a prescribed formula.**

**Smith (2001) reports a study in which she sought to evaluate the use of social stories across a range of home and school settings; a training programme was developed covering two half-day sessions. It was offered free to schools in both affluent and socially deprived areas, with mainstream teachers, learning support assistants and parents being invited onto the course that had or were working with a child with ASD. The emphasis was on learning together in small groups; nineteen stories were written and delivered to both primary and secondary school pupils; the majority of school-based staff, parents and carers who used**



the approach rated it as enjoyable, practical and effective. Others who did not complete the compilation of a Social Story gave the following reasons:

- Insufficient time to observe the child.
- Lack of time to meet the child.
- Poor illustrative skills by the compilers.
- Lack of opportunities to discuss the story content with others.

Other comments made from course attendees referred to doubts about whether or not learning of social skills had actually taken place; it appeared that the social understanding and appropriate behaviour had not become internalised.

Social stories are currently being researched for effectiveness and those who use them are reporting promising results (Moore, 2004; Kuoich and Mirenda, 2003). Whether the positive anecdotal results reported so far are due to confounding factors that involve an increase in the level of one-to-one activity between pupil and adult is yet to be determined: there is certainly no evidence to suggest that social stories are not in some way a beneficial approach; however, systematic research is required in order to evaluate their effectiveness and this is acknowledged by Smith (2001) in her study.

In a very recent study, Toplis and Hadwin (2006) investigated the effectiveness of social stories as an intervention with five 7 year old school children who were experiencing difficulties in the dining-room at lunch-time; an ABAB design was used with the targeted behaviour (situation) consisting of a requirement on the part of each participant to enter the dining area and find a seat without causing

a disturbance. Independent raters were used to measure the dependent variable, finding a seat without a fuss; inter-rater reliability checks were made during 28% of the observations recorded throughout the study. The outcome revealed that the behaviour of three of the participants (60%) improved significantly, whilst in the other two (40%) there was little or no effect. This clearly indicated that some children (or categories of behaviour) did not respond to social stories; this disparity was acknowledged by Toplis and Hadwin (2006) who recognised that more research was needed in order to identify precisely who would benefit from this approach.

It should be noted that the intention of the researchers in the above study was to examine the effects of social stories with non-autistic children; the participants in their study did not therefore have the condition, but the authors cite the following studies in which Social Stories were deemed effective with ASD: (Kuttler et al., 1998; Lorimer et al., 2002; Baron-Cohen, 2000).

## **17. Social Skills Training**

Another technique that shows great promise in improving the functioning of children with ASD is social skills training (SST); this is not a new approach, and its origins can be traced back to the art of rhetoric as first practised in Athens in the fifth century BC (Collins and Collins, 1993). According to the aforementioned authors, then, as now, its aim was to help people to develop ways of interacting with others that was not only in accord with their own views, but also served to improve social relationships; from what would then have amounted to focused oratory aimed at influencing a sophisticated audience:

**social skills training (SST) has developed into a precise method for helping a range of individuals with various problems or disabilities to develop effective communication skills.**

**From its early beginnings, SST was the prerogative of parents and in education teachers who relied heavily on the former to train their children in the development and use of social skills; however, by the 1960's and 1970's SST became multi-directional by focusing on two important social areas of concern.**

**The first emerged as a result of epidemiological studies that revealed that many individuals with serious and enduring psychiatric illness were frequently admitted to psychiatric services: it was also shown that there was a high correlation between hospitalisation and the social isolation of individuals with serious psychiatric conditions (Bloom, 1968).**

**In view of the above findings, it was argued that by increasing the levels of support available for those with mental health problems, and developing their social skills (levels of social functioning) could help to combat isolation and result in a significant reduction in admissions to hospitals: in fact, as part of the World Health Organisation (WHO) research into schizophrenia, Strauss and Carpenter (1972) did find that good social contact was one of the main predictors of favourable outcome in terms of deinstitutionalisation.**

**The second focus of SST coincided with the emergence of the women's movement which considered many women in the workplace and higher education to be ill equipped to assert themselves in challenging social situations; the prevailing view at the time was that the traditional position of**

women in society automatically placed them in submissive roles in situations dominated by men.

The remedy for the above inequality was for women to engage in SST that was aimed at improving their ability to express themselves and act on their desires in a legitimate rather than an aggressive manner; learning to communicate in a clear, precise and honest fashion was viewed as a way of improving relationships and expressing feelings in a direct and positive way. By taking this stance, women were able to avoid manipulation and exploitation by people in authority (Pledge, 2003).

Since the latter part of the 1980's, the notion of SST has evolved into one of empowerment rather than treatment; the goal of therapy nowadays is not to try to influence the behaviour of the "patients" directly, but support the "client" in change through self-instructional and self-monitoring approaches (Chadwick et al, 1996), which is now considered to be a cognitive and behavioural approach.

In the case of SST, as extensively used by the women's movement, assertive training is now widely used as part of communication training in settings as diverse as company boardrooms, educational institutions and the mental health sector (Pledge, 2003).

SST is derived from social learning theory (Bandura, 1969) and operant conditioning (Liberian, 1972) and, as such, is based on techniques that have a long pedigree in terms of effectiveness in a range of learning and behavioural therapies. The principles that underlie learning theory, such as, shaping and



reinforcement apply: in fact, a large body of research exists that supports the efficacy of SST for schizophrenia and other serious mental health problems (Wallace et al., 1980; Halford and Hayes, 1991; Liberman, Kopelowicz and 1999; Heinssen et al., 2000).

Being able to interact successfully is essential to many important life experiences, such as: developing and maintaining friendships; participating in recreational activities; gaining and remaining in employment; and simply experiencing a fulfilled existence. On the other hand, for those who lack social skills the outlook can remain rather bleak: since social skill deficits can lead to social isolation, delinquency and mental health problems (Koenigsberg, 2003). Other related problems in young people can include: school truancy, low educational attainment levels, substance abuse, aggressive behaviour and peer rejection.

It has been proposed by Christopher et al, (1993) that social interaction is critical for an individual's adjustment in a number of ways that include the following:

- **Establishing support systems for emotional and social needs**
- **Developing moral judgement and social needs**
- **Improving and maintaining self-esteem**
- **Promoting inter-personal competence and adult-like behaviour**
- **Developing independence to assist separation from family**
- **Recreation and entertainment**
- **Courtship and mate selection**

Accepting the views of the above authors means that the implementation of social skills training programmes is an important developmental aid for a range of individuals who have deficits in this area.

## **1 8. Definition of Social Skills**

Social skills deal with three main elements: cognitive, behavioural and environmental. Gresham and Elliot (1984) define social skills as behaviours which in a given situation predict important social outcomes, such as:

- Peer acceptance and popularity
- Acceptance of behaviour by significant others
- Social acceptance and positive judgements by significant others

The above authors are clearly indicating that popular children are less likely to experience significant difficulties than rejected (socially incompetent) individuals: this has been borne out by other workers, who claim that rejected children show more serious adjustment problems later in life; demonstrate fewer assertive strategies; have higher levels of anxiety and lower levels of perceived social competence (Kennedy, 1990).

## **1 9. Treatment of Specific Disorders**

A specific example of the way in which social skills training would be used, is in a situation in which a therapist teaches an individual with alcohol dependence how to avoid drinking in settings where alcohol is served, such as: at a party,

business meeting, lunch-time event or a position where others may apply pressure to encourage them to consume alcohol.

Another example where SST can be beneficial is for individuals who are shy or have social phobia. Whilst individuals with these conditions may be aware of social cues, they tend to avoid social situations where they feel embarrassed or threatened: for these individuals, SST can help them develop better communication skills; become more confident in presenting themselves in interview situations; conducting more effective telephone conversations; and generally developing better interpersonal skills, all of which, raise their self-esteem.

SST has been used successfully in the treatment of depression (Koenigsberg, 2003), by focusing on techniques that help the individual develop his or her assertive skills; this is achieved by training the individual to obtain more self satisfaction by meeting their own needs: for example, mingling more freely with others and actively engaging in positive interactions rather than withdrawing.

#### **I 10. SST Combined with Other Therapies**

SST is often used in combination with other therapies (Koenigsberg, 2003) in the treatment of mental health problems such as: in cognitive restructuring and coping skill training; and in conjunction with medication for phobias; and in depression and schizophrenia.

## **I 11. Other Skills Improved by SST**

Amongst other skills improved by SST are: dealing with anger appropriately; seeking the correct advice; learning to accept the consequences of one's own behaviour; and in dealing successfully with losing, making friends and compromising with others (McGlynn and Rutherford, 2001).

## **I 12. Features of SST**

There are a number of common features associated with SST programmes, with most requiring a structured approach which incorporates profiling and evaluation mechanisms. Bellini (2000) proposes a five-step model specifically for individuals with ASD; although the basic approach would be suitable for other individuals with social deficits. He identifies the following five steps:

- 1. Identify social skills deficits**
- 2. Distinguish between skill acquisition and performance deficits**
- 3. Select intervention strategies**
- 4. Implement intervention**
- 5. Assess and modify intervention as necessary**

The first step of the social skills training process consists of an evaluation of the levels of social functioning of those to be included in the programme: this involves identifying their strengths and weaknesses which are regarded as important features in determining the overall treatment plan; as part of the assessment process, it is also recommended that a combination of naturalistic



as well as structured observations are made together with psychometric testing, interviews (parents, teachers and other supervisors) and the completion of an ASD checklist. The result of the assessment process is designed to produce individual profiles that are then used to facilitate programme construction and goal planning.

The requirement of step 2 is to ascertain whether or not the individual has acquired particular skills (e.g. turn-taking); this information can be gained from the interview in step 1 and confirmed through the observations: if the skill in question is an acquisition deficit (he or she has not learned it), then it is targeted for inclusion in the intervention; if it is a performance deficit (learned but not used), then situations may be presented (role play) that are likely to illicit the behaviour in training sessions which also encourages the development of fluency of expression of the skill in question (Gresham, 1998).

Working through the above assessment process suggests intervention strategies: however, these will depend on the client group involved; on the one hand, a treatment plan may be fairly straightforward, initially requiring simple improvements in basic communication skills, such as, eye contact or listening skills. Alternatively, it might indicate quite sophisticated strategies that include: board games, pen and paper exercises and role play that involve practising hypothetical social situations, such as, visiting a restaurant or purchasing items from a shop.

Implementing interventions requires structure and the adherence to a number of set routines in which specific behaviours (those included in the aims and goals

of the programme) can be constantly practised; some programmes start each training session with a discussion about the previous lesson, followed by a question and answer session. There may also be opportunities for course participants to practise set routines incorporated into the programme, such as, greeting others and paying compliments.

The final step in the above model (which is not linear as its title suggests) is to evaluate and modify targeted behaviours according to progress; if an evaluation reveals that an individual is not able to sustain attention in a small group setting, a decision could be made to teach the social skill explicitly in a one-to-one situation until attention span levels (e.g. listening skills) improve sufficiently to warrant a resumption of group activities.

Gresham (1998) points out that just simply teaching social skills within a classroom or structured setting will not be sufficient to ensure that the skills will be internalised by course participants; although new behaviours can be taught by direct instruction, their expression may only apply in the situation or environment in which they are taught. There is therefore a need to ensure that newly acquired skills are not just reinforced in the training situation, but in a range of settings.

There are a number of commercially available SST programmes that do contain the essential elements outlined above; although these were not specifically compiled for individuals with ASD, the authors do contend that they are suitable for individuals with the disorder. Two of the most popular programmes are:

***Socially Speaking* (Schroeder, 2003).**

***Social Use of Language Programme* (Rinaldi, 1992).**

The programmes are usually compiled as units which are delivered over periods lasting up to a year with one session each week; specific areas are covered with the aim of teaching pupils a wide range of social skills that will generalise to different situations. Throughout the duration of the programme the pupils are offered the opportunity to practise skills such as:

- Greetings
- Turn-taking
- Eye contact
- Listening
- Compliments
- Emotions
- Telephoning others
- Showing an interest in what others are saying
- Sitting appropriately and still
- Asking and answering questions
- Using your voice effectively
- Developing and maintaining friendships
- Communicating in a wide variety of situations, e.g. school, friend's house or a restaurant.

In the case of the ***Socially Speaking*** programme (Schroeder, 2003) each session has a similar format and is reported to work well with between six to

eight pupils. The mix of the group is clearly important and under normal circumstances one would ideally aim for pupils who compliment and improve the group dynamics: although the compilers claim that the programme can work with any individual who has poor social skills, including those with ASD (Schroeder, 2003).

Small groups allow pupils to become familiar with each other, and an adherence to a routine at the start of each lesson enables them to become receptive to the teaching material presented; all sessions are usually conducted around one large table and involve both the teacher and pupils in a set of prescribed activities thus:

1. Greetings
2. Game
3. Review / discussion
4. Role Play
5. Worksheet
6. Compliments

Towards the end of a teaching session, another exercise (a board game) allows pupils to practise important skills related to social understanding thus:

- Eye contact
- Turn-taking
- Non-verbal communication
- Expressive language



- Verbal comprehension
- Ability to change a routine
- Listening
- Play

In addition to the above there are four types of “situations” that the pupil has to learn to deal with. These are:

1. Home
2. School
3. Out and About
4. Socially Speaking

The inclusion of the above dimensions is important and is designed to generalise the social skills that have been taught for a range of situations and settings.

### **I 13. Examples of SST Studies with ASD Children**

One of the first investigations in the social skills literature to utilise naturalistic behavioural observations to clarify the social behaviour of children with ASD was undertaken by Koegel, Koegel, Frea and Fredeen (2001). These workers compared children with ASD and their typically developing peers in the same setting; the participants consisted of 5 children, four male and one female diagnosed as having ASD; all were enrolled in an inclusive classroom setting.

Observers recorded the following three target behaviours weekly for each group:

1. The number of minutes engaged in a task.
2. The number of stimulus items used when engaged in a task.
3. The number of social-communicative interactions emitted.

The results showed that the children with ASD used the same number of task objects as comparison children; however, they spent far less time engaged with each item. Overall, children with ASD were engaged in the task only half as long as contrast children. Additionally, the children with ASD rarely engaged in social-communicative interactions with other children, whereas the comparative children did.

The above findings were considered to be consistent with the literature on ASD and provided strong evidence that children with ASD have severe deficits in the area of peer interaction skills; it was hypothesised that children with ASD would become more willing to interact with others if given the opportunity to practise newly acquired social skills with normally developing classmates also placed in the training programme; since inclusion is the long-term aim for children with ASD, it was further recommended that social skills training should be an integral part of inclusion.

In another study, Garfinkle and Schwartz (2002) used a single subject research design across four male pre-school children with ASD to evaluate the effectiveness of a peer imitation intervention during the participants normal

classroom programme. The purpose of the investigation was not only to evaluate the effectiveness of a peer imitation intervention, but to examine generalisation of the imitation skills that were acquired; following baseline, children with ASD and their normally developing peers were grouped and put through a four-step intervention that was continued until each child, including those with ASD, had experienced the opportunity of becoming the “leader” twice each session. Any social interaction or imitation of peers that occurred during an interval was recorded.

Although the results indicated variability in the behaviours of all target children, each of those with ASD was able to imitate their peer’s behaviour with little prompting; furthermore, the rate of non-social engagement increased from baseline during the intervention phase and the levels were maintained. Interestingly, the data also revealed that the target children spent more time within the same play area as their peers during and after interventions relative to their baseline levels.

The above findings are important because the researchers demonstrated with relative ease that the prerequisite skills for educational progress and social awareness within a mainstream setting could be achieved; in fact, they described the implementation of a peer imitation intervention as: “*exceedingly easy to accomplish*”. Moreover, the intervention had the added advantage of demonstrating to teachers the practical aspects of inclusion.

Smith and Fluck (2000) conducted a study in which they compared the more conventional approach to fostering the development of communication skills in

young children, with one that focused instead on social interaction through the use of games. In the more traditional approach the focus was on the production and comprehension of linguistic forms, rather than considering the effects of interactional processes on the development of communication skills.

The researchers used twenty 3 to 5 year old children diagnosed as having language or communication difficulties; a group comparison design was used in which the participants were divided into two groups of 10 (Groups A and B). In the control condition the focus was on prompting language use (increasing utterance length) and developing the participants' understanding of linguistic exchanges; the participants in the intervention phase were exposed to graded games that were increased in complexity whilst remaining consistent with their levels of development.

The above involved the participants working with an adult who initially modelled the game and the participants' successive attempts to then play by the rules: it was therefore a shaping of the participants' behaviour until a meaningful two-way social exchange could be achieved; in doing this the aim was to (re)construct the social-cognitive framework which normally underlies and supports the acquisition of communication skills in young children (Bates, Dale and Thal, 1995; Bruner, 1981). The theoretical basis of this approach owes much to the phases noted by Bruner (1983) in the development of social communication and includes the initial stage of joint facial expression before progressing to the roles of observer, initiator and finally negotiator within a didactic interaction.



The results of the above study showed significant improvement in the level of participation in social game formats and language development in the intervention group when compared with the control; the overall conclusion of the study was that communication skills can be developed more effectively by providing a learning environment in which interpersonal exchanges can occur, rather than focusing on language per se.

#### **I 14. Limitations of SST**

As stated previously, research supports the notion that new behaviours can be taught through direct instructional techniques (Gresham, 1998); however, as so often happens, the skills are taught in contrived situations that do not apply generally and therefore have little meaning outside the teaching environment. The pupil may learn that being respectful to the teacher is the best way to get what he or she wants, but fail to grasp the fact that the strategy works when used generally. Other difficulties can arise when behaviours are targeted that have little practical use outside the classroom; for example, most children are taught to raise their hand to get attention and whilst this makes life easier for the teacher, it is a behaviour that has virtually no use outside the teaching environment.

Gresham (1998) emphasises the need for teachers and others using SST to think carefully about which skills to teach; the example quoted above (raising hand), although useful, is probably less desirable than teaching an individual how to start and terminate a conversation appropriately: in fact, once achieved, this may be developed into conducting conversations in different situations and

settings over time; however, according to Gresham (1998) this level of training rarely occurs.

The most frequently voiced criticism of SST programmes is that the taught skills fail to generalise to other settings: often, training programmes do not provide opportunities for pupils to practise the skills in a variety of settings (Goldstein, Glick, and Gibbs (1998); and because of this the behaviours are not subject to what Gresham (1998) refers to as “naturally occurring reinforcers”, such as, praise, attention and positive feedback. In other words, if taught behaviours are to be maintained, they have to be practised (before they can be reinforced) in a range of settings. Unfortunately, this does not often occur.

## **J. JUSTIFICATION FOR STUDY**

It was stated earlier in this chapter that interventions for ASD have been traditionally based on developmental or learning theory; these have been successful and generally popular with users, but have not directly addressed the core deficits of ASD in relation to social, communication and thinking skills. They have also failed to address the important issue of inclusion for individuals with ASD; this is clearly important in terms of providing the opportunity for communication to occur within a normal social environment, which is where language and social development arise.

With the advent of powerful cognitive models of ASD, the situation for more effective interventions for individuals with the disorder has improved considerably; there is now a better understanding of the difficulties encountered

by those with the condition and hence improved prospects of designing more precise and effective ways of treating or intervening with the syndrome.

Social skills training in particular can offer real prospects for progress because the technique focuses on helping the individual to develop attributes that are essential for social functioning, communication and learning. This is achieved by (re) constructing a normal social milieu where interpersonal communication can occur: in other words, conditions are created that are necessary for communication skills to develop.

The adoption of the social skills training package for this study was a deliberate choice because it fulfilled the necessary conditions for the acquisition of essential social skills required for effective communication; moreover, it allowed the participants to practise newly acquired skills and establish them centrally. In addition it encouraged them to act out various roles as commentators, observers and initiators as a way of gaining insight into the thoughts of others and develop a theory of mind.

The notion of communicators adopting various roles or perspectives when exchanging ideas and information in the process of conversation is not new; in fact, Bruner (1983) describes how children come to enact sequential roles of listener and speaker in shared turn-taking games, by exchanging the role of actor (speaker) and observer of their partner's action; put more simply, engaging in a joint activity that allows task or topic relevant ideas to be exchanged is the essence of communication.

The current researcher considers that the intervention used in this study contained essential elements used in social situations in which communication occurs: that is, one in which the participants were able to engage in shared play, enact social rules, use social language and practise the expression of emotions; furthermore, it had a sound theoretical basis that focused on promoting socially meaningful communication as a way of developing crucial communication attributes normally lacking in individuals with ASD.

The methodology adopted was one that has been recommended by many prominent researchers in the field of ASD (Jordan, Jones and Murray, 1998; Mesibov and Howley, 2003; National Research Council, 2001). The opportunity, however, has not presented itself hitherto because the conditions in which to conduct a study of this nature have not been available; that is, a study containing sufficient numbers of individuals with ASD in a naturalistic setting such as a mainstream school. From the current researcher's perspective this was a unique opportunity to engage in a valuable project for all those concerned.

### **J 1. Summary of the Research Questions**

The research questions are fully described in the next chapter, but a summary at this point is considered to be helpful:

- 1. Can social skills training improve the communication skills of individuals with ASD?**
- 2. Can any learned social skills be maintained and generalised?**



It was earlier stated that TEACCH programme was in use in the host school in a modified form; the method was adopted as a way of organising pupils with ASD to access teaching material through the use of visual timetables and lesson folders. It was not, however, part of this study and should therefore be regarded as a general variable; although thought was given to terminating the TEACCH programme throughout the duration of the study, as a general variable, TEACCH was not considered to be a threat in any way (along with other general variables) to the integrity of this study; its termination would have changed the school routine unfavourably; for example, the participants' support assistants could have been assigned other duties, which, in itself, would have unsettled the pupils.

In terms of benefits, it was hypothesised that social skills training would improve the overall functioning of the participants in the study: and that this would be achieved by presenting the participants with opportunities to learn and practise not only basic communication skills, but higher order ones that involve an appreciation of relationships and feelings that people normally acquire through the development of friendships and attachments. It was also hoped that newly acquired skills or attributes would not only be maintained, but would generalise to a range of settings: in addition, it was expected that the participants would also develop better organisational skills and an understanding of the important elements involved in task analysis and completion; for example, identifying correctly the steps required in a sequence, such as, planning an assignment or experiment and compiling a week-end shopping list.

It should be emphasised at this point that terms such as “attributes” and “appreciation of relationships” perhaps implies an attempt to bring about a sort of cure for ASD; this is not the intention, but rather an attempt to create favourable conditions in which social skills are taught within a social setting where they could be practised and modelled: the best that could be hoped is that the participants would learn to communicate more effectively.

## **CHAPTER THREE: RESEARCH AIMS AND HYPOTHESES**

The main aim of this study was to examine the effects of social skills training on the subsequent development of social skills in individuals with ASD; it was hypothesised that by providing an appropriate comprehensive programme the participants in the study could acquire the necessary skills that would enable them to communicate more effectively, socialise, develop friendships and generally be more successful within a complex educational environment.

It should be noted that any reference to *learning outcomes* is meant to be specific to the aims of the social skills training programme and not the more general targets of the National Curriculum: whilst the attainment levels of the participants were expected to improve significantly because of better social, communication and thinking skills acquisition, it was not planned to systematically measure general improvements in attainment skills as part of this research study; however, subsequent teacher assessments and examination results did reveal substantial gains in these areas.

### **A. RESEARCH QUESTIONS**

#### **A 1. Research Question One**

**Can social skills training for pupils with ASD improve their social, communication and thinking skills?**

## **A 2. The Null Hypothesis for Research Question One**

*There will be no difference in the social, communication and thinking skills between participants in the intervention versus the non-intervention condition.*

## **A 3. Research Question Two**

**If the characteristic features of ASD can be improved with social skills training, can the learned skills be maintained and generalised to a range of settings?**

## **A 4. The Null Hypothesis for Research Question Two**

*There will be no difference in the behaviour of the participants between the baseline and training phase; there will therefore be no generalised application or maintenance of social, communication and thinking skills.*



## CHAPTER FOUR: METHODOLOGY

### A. RESEARCH DESIGN

The design used in this study was experimental, although some qualitative data were collected in order to identify themes or patterns; the efficacy of the intervention was evaluated by using a two-group research design that incorporated two measuring points, Time 1 (baseline) and Time 2 (post intervention); in other words, by measuring the social skills (dependent variables) of the participants before and after treatment.

Twelve participants were identified who were all attending the same secondary mainstream school: they had all been diagnosed as having ASD and were reasonably well settled in the host school; the participants were matched as closely as possible for variables such as: levels of functioning, attainments, levels of motivation, gender, behaviour and socio-economic factors before being allocated to one of two conditions (experimental or control). Tables 4:1 to 4:5 below show the personal profiles of the participants.

**Table 4:1 Showing Some Social and Environmental Variables that can be Influential in Outcomes for Disabilities**

		School Meals		Socio-economic status		Parents and professionals work in partnership	
		Free School Meals	Parents fund school meals	Low socio-economic	Moderate socio-economic	Very high level	High level
Sex of Participants	Male	6	4	7	3	8	2
	Female		2		2	2	
Group	Group A Count	3	3	4	2	6	1
	Group B Count	3	3	3	3	6	1

Following the above process the participants were randomly assigned to one of two groups of six (Groups A and B): each group now spent an initial period of 6 weeks in baseline, following which, Group A received the treatment (having been randomly selected to do so) for an additional period of 19 weeks. Meanwhile, Group B remained at baseline level in the absence of any treatment, but serving as a control group in parallel with Group A for the same period of time.

Broadly speaking there were two phases attached to this study, the first comprised the two group model comparing treatment versus non-treatment; the second involved providing the same intervention with identical features for Group B under the same conditions as provided for Group A. Unfortunately, for logistical reasons it was not possible to pursue a two-group cross-over design using repeated measures.

The study took 18 months to complete and is shown in diagrammatic form in Figure 4:2. As can be seen the illustration outlines a typical two-group experimental design. As stated above, Group B also subsequently entered the SST programme and made significant gains in their social skills, but some data were not available to report. Instead, it was agreed with school-based staff that it was more important to concentrate on delivering the training to Group B.

### **Pre-treatment Measures**

As stated above, both groups received pre-treatment or baseline measures throughout a 6 week period; although measures were recorded weekly for all 12

participants in the same English lesson with the same teacher, only week 6 was used in the data analysis. This particular week was the last in the initial baseline period and was deemed to be the most reliable: this was because the participants needed time to settle to an unusual situation in which independent raters were present in the classroom. The focus was on recording the 8 dependent measures, whose levels the current researcher was seeking to increase through the use of the SST programme.

The independent raters were trained in the use of precise measuring techniques that would allow them to accurately recognise and record the variables under consideration: this also provided a system by which consistency of recordings were most likely to occur; similarly, the reason for using the same teacher, lesson and time frame was in an attempt to hold variables as constant as possible; in other words, the participants might well have behaved differently for different teachers in different lessons, thereby making the task of accurately measuring changes in behaviour impossible. These were necessary conditions without which it would not have been possible to determine the effect of the training programme (independent variable) on the development of social skills (dependent variable) on the participants.

The intensive SST programme was designed to be run throughout a twelve month period for small groups: in order to accommodate the possibility of eventually using two groups, however, two double period training sessions were used instead of four single sessions each week; during the study there were ongoing assessments and evaluations of both learning and the intervention materials offered by school-based staff. This was done primarily to ensure that

the participants were not being disadvantaged by being part of the SST programme.

The above monitoring was considered necessary by the host school in order to justify the continuance of the study; this was, after all, a significant commitment on the part of the headteacher and his staff. Had the participants, parents or staff experienced any difficulties whatsoever in relation to the project, it would have been abandoned; fortunately, the study went very well and as a consequence two groups of participants were ultimately able to benefit from SST.

### **Post-treatment Measures**

This was considered a crucial stage in the study, since it represented the point at which any evidence for the effect of the independent variable on the dependent variable would become apparent: it also meant that success for Group A would signal an extension of the SST training programme to include Group B.

The post treatment measures for both groups were due to be taken from data collected during week 25: this coincided with the last week of the intervention and was clearly ideal for comparative purposes. In the case of Group B this was achieved as planned, but during that particular week most of the participants in Group A were unexpectedly out of school; these absences were due to unforeseen circumstances that could not have been avoided: as a consequence



the measures from week 26 were used; the implications of this are discussed later.

**Figure 4:1 Two-Group Experimental Design**

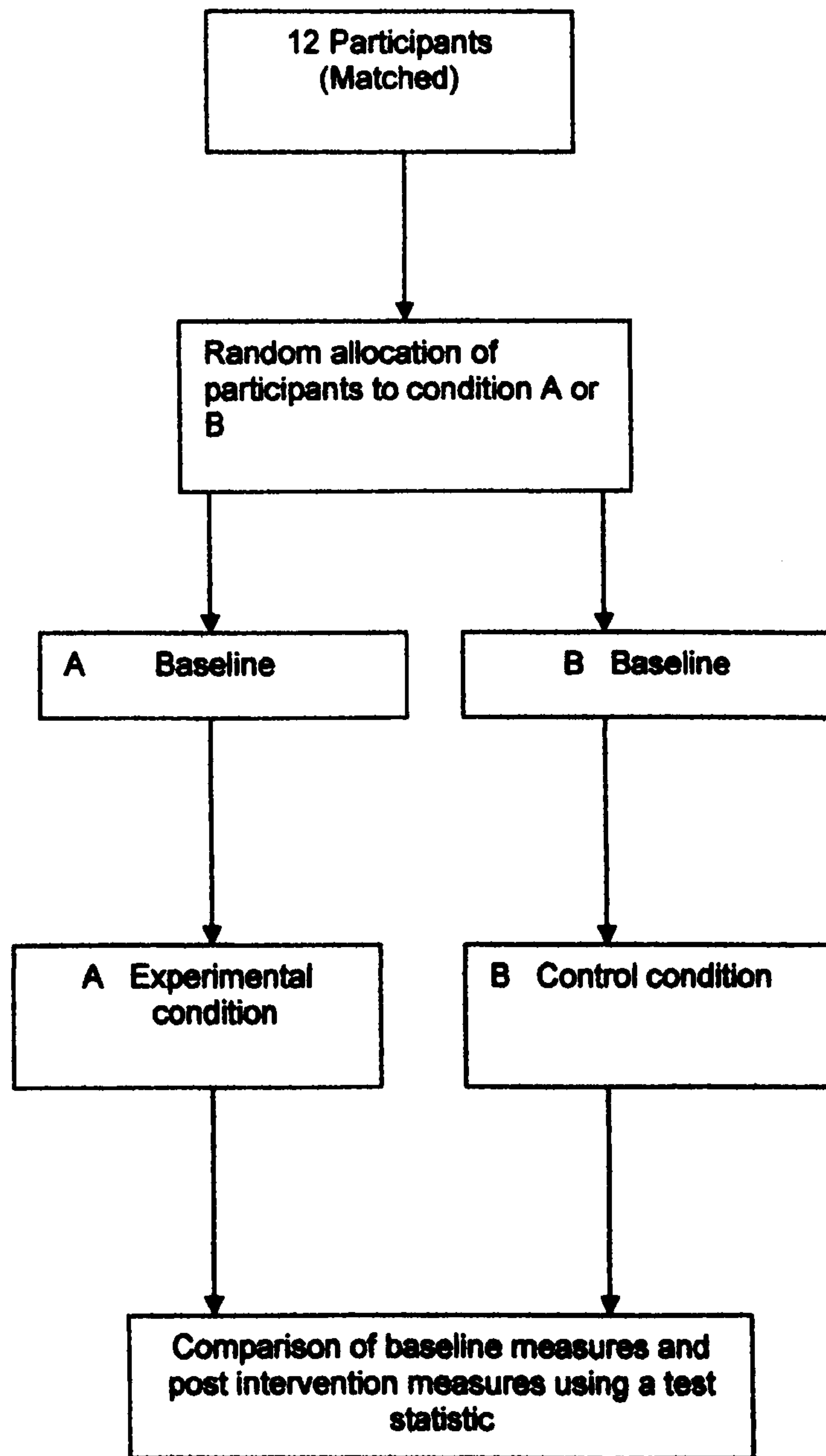


Figure 4:1 above shows a two-group comparative research design in which Group A is compared to Group B

**Figure 4:2 Diagrammatic Representation of the Study Sequence**

	May-June 03	June-Dec' 03	Jan'-July 04	Sept'-Jan' 05
<b>Group A</b>	Baseline	Intervention	Data analysis / training period for control	Parental feed- back and writing- up periods
<b>Duration</b>	6 weeks	19 weeks	19 weeks	10 weeks
<b>Measuring points:</b>	week 6	week 26	Monitoring only	Monitoring and debriefing periods

	May-June 03	June-Dec' 03	Jan'-July 04	Sept'-Jan' 05
<b>Group B</b>	Baseline	Baseline	Intervention	Parental feed- back and writing- up periods
<b>Duration</b>	6 weeks	19 weeks	19 weeks	10 weeks
<b>Measuring points:</b>	week 6	week 25	Monitoring only	Monitoring and debriefing periods

The reader should note that each group received the equivalent of four lessons each week during the training periods. Groups A and B were also exposed to the same training programme in identical conditions.

The above diagrammatic representation shows the sequence and time-frame of the study; as mentioned in the main text the investigation lasted 18 months and was completed in January 2005; the analysis of data and writing of this thesis was continued into 2007.

## **B. SAMPLE SELECTION AND CHARACTERISTICS**

### **B 1. Sampling Method**

Although in part opportunistic (having all 12 pupils within the same school) the participants were what Robson (1993) refers to as a “typical sample”: that is, they all had ASD and could therefore be described as representative of that particular population (all individuals with the condition ); this does not, however, deny the fact that those with the disorder can vary considerably in terms of temperament, symptoms, cognition, motivation and behaviour; nevertheless, the conditions were from a study perspective ready made and as such presented a “golden” opportunity for the researcher in terms of a sample selection process.

It is acknowledged that although the sample size was small, it was also the case that greater participant numbers would have imposed a significant burden on school-based staff; furthermore, the logistical aspect of teaching would have ultimately proved unmanageable in terms of collecting the data throughout the 18 - month duration of the study. In fact, as mentioned earlier, a tight schedule was needed in order to ensure that the teaching material could be delivered to the participants.

### **B 2. Inclusion Criteria**

Although the participants were already attending the school; their inclusion in this study was not a foregone conclusion: indeed, their participation depended

first and foremost on parental and pupil agreement, secondly on their suitability and thirdly on the research proposal being approved; it was also a pre-requisite that all had to have been identified as having ASD.

From a research perspective it was desirable that the participants were reasonably similar in terms of cognitive functioning and attainment levels; from the results of psychometric testing (Tables 4:2 to 4:5), it can be seen that for both within-subjects and between-groups the levels of cognitive functioning were similar (as measured on the WISC-III); this was also true of their literacy skills (WORD), but it is interesting to note that on Basic Reading and Spelling nearly all the participants scored well above their chronological age and ability levels; this is a common feature associated with the more able individuals who have ASD (Attwood, 2004); the themes of cognition and attainments are discussed more fully in section B 6.

Another requirement of the study was that the participants were free from any serious medical or psychological conditions that could be reasonably expected to bias the research; this also applied to other factors such as the use of medication, except for very minor and non-persistent ailments.

All participants had been tested for visual and hearing difficulties as a normal part of the educational screening processes afforded to all school pupils; no abnormalities had been identified (as reported by parents) and it was judged by the researcher and school-based staff that all the parents of the participants in the study were caring people who possessed high levels of tolerance, coupled



with sound management skills within the context of the unusual difficulties that arise in ASD.

It was further noted that as far as one could tell, there was an absence of serious family disharmony and other serious life events that might have biased the research: however, stress levels were often quite high within the family and these were reported by parents to be linked to issues that invariably arise in families who support children with ASD; for example, difficulties related to obsessive behaviours, an inability to relate to peers and teachers, reluctance to attend school and not infrequently issues connected with alleged bullying. All participants in the study were from an English speaking background and living with their families at home.

### **B 3. Exclusion Criteria**

The following exemptions were imposed as a participant safe-guard measure:

- Any pupil who had medical or psychological conditions in addition to ASD.
- Pupils with excessively poor attendance records.
- Pupils who were not living with their parents.
- Any pupil or carer who could not speak English.
- Pupils whose literacy skills were too poor to access the teaching material.

## **B 4. Participants**

The participants comprised twelve individuals identified as having ASD; their ages ranged from 11 to 15 years, of these two were from Year 7, six from Year 8, three from Year 9 and one from Year 10. All participants had received a diagnosis of ASD and were all in the same secondary school placement. This high number of pupils with ASD in one non-specialist secondary school placement was extremely unusual and would not under most circumstances represent the norm for a secondary school anywhere in the country. This situation probably came about in this particular school because of a number of circumstances: such as, six of the above pupils had presented with significant behavioural problems in previous schools and were not coping; this may have been due to a number of factors, such as, high levels of anxiety, pressures of a large mainstream school environment and an absence of structure and difficulties related to social integration.

Pupils with ASD often do find secondary school more challenging than the primary sector. In primary school the pupil is exposed to much more structure across the year levels and retains the same teacher for at least a year for all taught subjects. Moreover, the pupil follows the same peer group throughout his or her time in the primary sector and is less threatened by the constancy that this brings. On the other hand, secondary schools often have in excess of 1200 pupils (as opposed to 350 in a fairly large primary school); in addition, each subject is taught by a specialist teacher in a different location throughout the school and pupils are expected to be well organised in terms of adhering to a

timetable and demonstrating independence in planning and locating each lesson whilst being appropriately prepared.

In order to avoid secondary school failure, rigorous planning prior to transfer is often undertaken between both sectors in relation to children with ASD: in the absence of this there is a risk of early failure due to the pupil's unwillingness to attend school. This is probably related to the individual's natural inclination to resist any change (preservation of sameness), which as previously inferred, may impose a serious threat.

In the case of the participants in this study, reports indicated that the transfers to the school in which the study took place were the result of planning, negotiations between the schools involved, parental requests and a wish by all parties to identify an appropriate learning environment for the pupils concerned.

## **B 5. Participant Characteristics**

The participants in this study were in many ways just like individuals who do not have ASD; that is, they were all different in the way in which they expressed their personalities, cognitive strengths, weaknesses, likes, and dislikes. However, unlike their non-autistic peers, what made the group in this study truly unique was the way in which they perceived and experienced the world; that is, they all shared the common characteristics of ASD described in earlier sections. These include:

- Repetitive behaviours.
- Desire for sameness or routine.
- A desire to interact made difficult by limited social ability.
- Difficulty moving from one task to another.
- Restricted range of interests.
- Difficulty taking another person's perspective.
- Thinking literally.
- Difficulty with non-verbal communication (e.g. gestures / facial expressions).
- Difficulty in sharing.

All participants in the study had been diagnosed as having ASD by suitably qualified and experienced practitioners working locally; none of the participants had taken part in any study previously and were therefore naïve to research processes; they all met the criteria for ASD as outlined in the American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) or ICD-10. These are shown in Appendix 2 together with the modifications that have taken place to DSM-IV since 1980.

The 12 participants in the study were from relatively poor socio-economic backgrounds and the areas in which they lived were all very similar and within easy reach of the school; in the context of autistic spectrum disorders (ASD), all participants in the study were, however, reasonably able individuals.



## **B 6. Ability of Participant Sample**

The general level of cognitive functioning and reading skill attainments were assessed using the Wechsler Intelligence Scale for Children (WISC-III) and the Wechsler Objective Reading Dimensions (WORD). In the case of the WISC-III the Verbal subtests were used to assess the language skills of the participants.

All subtests of the Wechsler Intelligence Scale for Children (WISC - III) were administered with the exceptions of Symbol Search and Mazes: the former test is described by Wechsler (1992) as optional and the latter is a measure of planning ability and perceptual organisation. Given that poor executive functioning is a feature in ASD, it was considered unnecessary to place an extra burden on the participants by administering these two particular sub-tests; in any case, they do not normally form part of the scoring procedure and were not considered useful for this study.

Tables 4:2, 4:3, 4:4 and 4:5 below show brief results of psychometric testing:

**Table 4:2 Descriptive Statistics Showing Intelligence Quotients for Group A Based on the WISC-III Assessment**

<b>Descriptive Statistics<sup>a</sup></b>					
	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>Verbal IQ</b>	<b>6</b>	<b>61.00</b>	<b>110.00</b>	<b>82.8333</b>	<b>16.15446</b>
<b>Performance IQ</b>	<b>6</b>	<b>63.00</b>	<b>94.00</b>	<b>83.6667</b>	<b>10.87505</b>
<b>Full Scale IQ</b>	<b>6</b>	<b>60.00</b>	<b>102.00</b>	<b>81.5000</b>	<b>13.59044</b>
<b>Valid N (listwise)</b>	<b>6</b>				

**a. Group = Group A**

**Table 4:3 Descriptive Statistics Showing Intelligence Quotients for Group B Based on the WISC-III Assessment**

**Descriptive Statistics<sup>a</sup>**

	N	Minimum	Maximum	Mean	Std. Deviation
Verbal IQ	6	65.00	104.00	81.3333	15.18771
Performance IQ	6	67.00	88.00	80.0000	8.74071
Full Scale IQ	6	64.00	96.00	79.0000	12.42578
Valid N (listwise)	6				

a. Group = Group B

**Table 4:4 Descriptive Statistics Showing Literacy Attainment Scores for Group A Based on the WORD Assessment**

**Descriptive Statistics<sup>a</sup>**

	N	Minimum	Maximum	Mean	Std. Deviation
Reading Score	6	8.03	17.00	14.3517	3.54246
Spelling Score	6	8.06	17.00	10.5650	3.36203
Reading Comprehension Score	6	8.00	9.10	8.7233	.53795
Valid N (listwise)	6				

a. Group = Group A

**Table 4:5 Descriptive Statistics Showing Literacy Attainment Scores for Group B Based on the WORD Assessment**

**Descriptive Statistics<sup>a</sup>**

	N	Minimum	Maximum	Mean	Std. Deviation
Reading Score	6	8.03	17.00	13.0350	4.14463
Spelling Score	6	7.09	17.00	10.8833	3.85133
Reading Comprehension Score	6	7.09	9.10	8.2333	.75455
Valid N (listwise)	6				

a. Group = Group B

Overall, the Wechsler Intelligence Scale for Children (WISC-III) showed discrepancies between Verbal and Performance scores for most participants; on the other hand, most actually showed superior word reading and spelling skills, but were below average on the Reading Comprehension test of the Wechsler Objective Reading Dimensions (WORD). Tables showing the scores for each participant on the two instruments are shown in Appendix six: from these it can be seen that most participants scored significantly lower on

Comprehension than compared with other subtests. In fact, the differences were significant at the 0.15 or 0.05 level. As previously stated, discrepancies in WISC-III and WORD profile scores are common features in individuals with ASD.

## **B 7. School Characteristics**

At the commencement of the study there were approximately 90 qualified teachers and 22 unqualified support staff who worked as Classroom Support Assistants (CSA's) or Teachers Aides (TA's). The school had recently been in "special measures" and this had caused problems with recruitment and retention of staff: despite this the selection process for both qualified and non-qualified staff remained high. In July 2002 HMI decided to take the school out of special measures after witnessing a significant improvement in standards across all areas of the school: indeed, examination results had risen from 2.7% to 61% since 1999; staff at the school have presented as friendly, dedicated and appreciative of advice offered by the City Psychological Service.

The study was extremely well received by the school and no problems were encountered by the present researcher in gaining access to pupils, parents and relevant staff; the SEN team enthusiastically engaged with assisting the current researcher in the project and performed their respective roles with professionalism and care.

The school population amounted to approximately 1100 pupils that were drawn from the school's catchment area. The Special Educational Needs Co-ordinator

**(SENCO) had a pivotal role in this study and agreed to commit herself personally to the delivery of the modular material for the participants in the study. From a research point of view this ensured a high degree of consistency in the delivery of the teaching material (IV): in addition to this support, 6 of her 22 support staff (Teachers Aides and Classroom Support Assistants) agreed to act as independent raters in order to gather data throughout the project. As previously stated these project assistants were trained by the researcher in the recording techniques and the operational definitions applicable to targeted behaviours (DV).**

**All school-based staff had received extensive training in ASD over a period of 4 years delivered personally by the researcher as in-service-training; the request for the training came from the school in response to relatively high numbers of pupils with ASD being admitted. This of course pre-dated the research, but facilitated its introduction especially given the numbers of potential participants.**

**Despite extensive training in the past, staff members were not fully aware of the aims of the study; only one senior manager delivered the training material and although the raters were of course informed in respect of the particular behaviours being measured; they were not aware of the link between these and the social skills training package. This was a deliberate policy and adopted in order to avoid bias in measurement: amongst the topics that had been covered in general training were the following:**

- Working with pupils with ASD.**



- Understanding ASD using cognitive models (Theory of Mind, Executive Functioning, and Central Coherence).
- The application of TEACCH within a structured teaching environment.
- Whole school approaches to managing behaviour

## **C. MEASURES**

Unless otherwise stated all dependent measures used were standardised and age appropriate to the participants in the study.

### **C 1. Measures Completed by the Researcher:**

1. Wechsler Intelligence Scale for Children (WISC - III)
2. Wechsler Objective Reading Dimensions (WORD)
3. Diagnostic Interview for Social and Communication Disorders (DISCO),  
Wing, 1999.

### **C 2. Measures Completed by School-Based Staff.**

1. Self-Report Schedule
2. Evaluation and Assessment Sheets
3. Direct Classroom Observational Schedule for Independent Raters

## **Description of the Wechsler Intelligence Scale for Children**

The WISC-III contains 13 subtests, six of which form the Verbal Scale (Information, Similarities, Arithmetic, Vocabulary, Comprehension and Digit Span) and the other seven the Performance Scale (Picture Completion, Coding, Picture Arrangement, Block Design, Object Assembly, Symbol Search and Mazes). The IQ of an individual is based on 10 of the subtests with 3 being optional. In cases where more or less than 10 subtests are used prorating is necessary: for this a table is included in the WISC – III manual. The test takes approximately 90 minutes to administer.

### **Reliability and Stability**

The WISC-III was standardised on 2200 white American boys and girls selected as being representative of the population in 1940. The test was initially criticised on the grounds that it penalised children from ethnic groups and those from poor socioeconomic backgrounds (because they were not represented adequately in developing the norms): however, extensive clinical use of the WISC - III has not realised the initial concerns expressed by commentators; the test covers the age ranges 6 to 16 years.

Each participant's general cognitive functioning was assessed using the Wechsler Intelligence Scale for Children (WISC - III); intelligence quotients were not the main reason for testing, although, as previously stated, it was necessary to ensure that each participant could access the teaching material (IV): it was considered more important to obtain profiles for Verbal and Performance levels

that would reveal interpersonal differences that could be more valuable than full scale IQ's per se.

## **Validity**

Evidence for validity of test interpretation is multi-faceted and accumulated across many studies. The WISC - III has been compared with other cognitive tests of intelligence, such as, the Stanford-Binet, Wechsler Bellevue and other Wechsler instruments: the extensive literature reporting on such studies provide solid evidence of the validity of the WISC - III as measures of intellectual functioning of children; moreover, the factor analytic evidence and the correlations with other measures of intellectual ability and academic achievement provide support for the construct validity of the instrument. Table 4:6 shows the results of 15 students who were tested on the WISC-R and the WISC - III. The date of initial testing varied from 1989 to 1991 (Wechsler, 1992).

**Table 4:6 Coefficients of correlations (Pearson product-moment) on test-retest scores.**

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Verbal IQ scores	+ 0.80
Performance IQ scores	+ 0.73
Full Scale IQ scores	+ 0.73

---

These r values are all significant at the  $p < 0.01$  level of confidence

## **Description of the Wechsler Objective Reading Dimensions**

The WORD is an individually administered test designed for the assessment of children from 6 to 16 years. There are three separate components that each makes a distinctive contribution to the assessment of literacy skills: these are Basic Reading, Spelling and Reading Comprehension and are judged to be

fundamental to assessing an individual's progress in the acquisition of literacy skills from three perspectives. A composite literacy score derived from an individual's combined scores on all three subtests provides a measure of overall performance; each of the three subtests can also be used separately to address specific literacy difficulties.

### **Reliability and Stability**

Table 4:7 presents the split-half reliability coefficients for the three WORD subtests at each age level. Note that only years 10 to 16 are shown:

**Table 4:7 Reliability coefficients of WORD subtests at ages 10 to 16 years**

Subtest/ scale	Age in years						Average		(r xx)
	10	11	12	13	14	15	16		
Basic Reading	0.94	0.94	0.95	0.95	0.95	0.88	0.94	0.95	
Spelling	0.94	0.90	0.91	0.89	0.92	0.91	0.86	0.92	
Reading Comp'	0.94	0.90	0.83	0.90	0.94	0.82	0.86	0.91	

The stability of the WORD was assessed in a study of 367 children (from a standardisation sample) who were tested twice. The interval between testing ranged from 12 to 52 days with a median interval of 17 days (Wechsler 1991). Table 4:8 shows the average stability coefficients for each subtest for all age groups (6 to 16 years).



**Table 4:8 Average stability coefficients for all age groups**


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Basic Reading	0.94
Spelling	0.94
Reading Comprehension	0.84

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**Validity**

Evidence for validity of test interpretation is based on information accumulated from a wide variety of studies. These include evidence from inter-correlations amongst the subtests correlations with the Wechsler scales, studies of group differences, a multi-trait / multi-method study of WORD and other achievement tests. Table 4:9 shows the correlations between the WORD scores and the various IQ scores on the WISC - III. The data shown covers the age ranges of the participants in this study. That is, 11 to 15 years

**Table 4:9 Inter-correlations of WORD and WISC - III at age 11 (N = 78)**


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	Basic Reading	Spelling	Reading Comp'	WORD
WISC - III VIQ	0.59	0.61	0.70	0.70
WISC - III PIQ	0.55	0.57	0.49	0.59
WISC - III FSIQ	0.63	0.65	0.67	0.71
Reading Comp'	0.69	0.69		
Spelling	0.87			

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**Table 4:10 Inter-correlations of WORD and WISC - III at age 12 (N = 71)**

	Basic Reading	Spelling	Reading Comp'	WORD
WISC - III VIQ	0.59	0.48	0.68	0.66
WISC - III PIQ	0.24	0.27	0.38	0.29
WISC - III FSIQ	0.51	0.44	0.62	0.56
Reading Comp'	0.52	0.49		
Spelling	0.64			

**Table 4:11 Inter-correlations of WORD and WISC - III at age 13 (N = 80)**

	Basic Reading	Spelling	Reading Comp'	WORD
WISC - III VIQ	0.54	0.53	0.74	0.71
WISC - III PIQ	0.27	0.22	0.47	0.38
WISC - III FSIQ	0.47	0.44	0.69	0.63
Reading Comp'	0.49	0.53		
Spelling	0.72			

**Table 4:12 Inter-correlations of WORD and WISC - III at age 14 (N = 78)**

	Basic Reading	Spelling	Reading Comp'	WORD
WISC - III VIQ	0.50	0.49	0.77	0.68
WISC - III PIQ	0.34	0.32	0.48	0.44
WISC - III FSIQ	0.49	0.46	0.73	0.64
Reading Comp'	0.58	0.54		
Spelling	0.76			

**Table 4:13 Inter-correlations of WORD and WISC - III at age 15 (N = 77)**

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	Basic Reading	Spelling	Reading Comp'	WORD
WISC - III VIQ	0.43	0.42	0.70	0.63
WISC - III PIQ	0.31	0.23	0.48	0.41
WISC - III FSIQ	0.41	0.36	0.66	0.58
Reading Comp'	0.41	0.43		
Spelling	0.77			

---

### **Description of the Diagnostic Interview for Social and Communication Disorders (DISCO)**

The DISCO is an interview-based schedule for use with parents and carers; it was developed by Leekham, Libby, Wing, Gould and Taylor (2002). It is similar to other schedules such as the Autism Behaviour Checklist (Krug, Arick and Almond, 1980) and the Autism Screening Questionnaire (Berument, Rutter, Lord, Pickles and Bailey, 1999) but emphasises a much broader view of ASD. The items in the DISCO cover a very wide range of developmental skills and behavioural features, some common, some rare, many of which are not currently used as diagnostic criteria for ASD.

The primary purpose of the DISCO is to illicit information relevant to the broad autistic spectrum in order to assist clinicians in their judgement of an individual's level of development in various domains, their disabilities and specific needs. This distinguishes the DISCO from other interview schedules such as the Autism Diagnostic Interview (Le Couteur et al 1989) and the Autism Diagnostic Interview Revised (Lord, Rutter and Le Couteur, 1994) that were designed to relate closely to the diagnostic criteria for both the DSM -IV and the ICD-10.

In the two schedules referred to above the interviewer collects information on items of behaviour and is then required to make a series of judgements about whether or not certain categories of behaviour are present and if so to what degree. In contrast, the DISCO contains a very large number of items covering specific examples of behaviours seen in ASD: this enables clinicians to arrive at well informed judgements in respect of the individual being assessed.

## **Validity**

Testing the validity of any instrument that is used as an aid to diagnosing ASD presents serious problems: in fact, there is no definitive instrument in existence that tests for the condition (Leekham, Libby, Wing, Gould and Taylor, 2002). The clinical diagnosis of the disorder is based on behavioural features that are also elicited by the instrument: therefore, any attempt to test the validity of a new schedule such as the DISCO raises the inherent problem of circularity. Despite these difficulties the DISCO is the most comprehensive instrument available and also allows for a differential diagnosis; in the absence of a solution to the validity issue the authors of the schedule (Leekham, Libby, Wing, Gould and Taylor, 2002) adopted the accepted method of comparing clinical diagnosis with algorithm diagnosis. As a measure of reliability they compared inter-rater diagnostic agreement between researchers on the two dimensions on which they based their study.

In achieving the above they compared algorithms for autistic spectrum disorder as defined by Wing and Gould (1979) with algorithms for the sub-group "childhood autism" from ICD-10: in other words, they compared the validity of



the DISCO algorithms by comparing clinical diagnoses with diagnosis produced by algorithm output.

The children in the study comprised 33 with ASD, 19 with learning disabilities and 15 with language disorders: the groups had been diagnosed prior to being recruited to the authors' study; the design was counterbalanced with two trained researchers being present at every interview and each conducting half the interviews across the age ranges. One researcher conducted the DISCO interview and coded the parent's responses and the other listened and completed the DISCO without conferring. Table 4:14 below shows the numbers of participants in each clinical group with algorithm diagnosis of autistic disorder.

**Table 4:14 Numbers of children in each clinical group with algorithm diagnosis of ASD.**

Clinical diagnosis				
Algorithm diagnosis of autistic disorder	Autistic low functioning	Autistic high function'	Learning disability	Language disorder
ICD-10 and WG	16	17	04	00
ICD-10 only	02	01	06	04
Neither algorithm	00	00	07	10
Total	18	18	17	14

The results showed that both algorithms were significantly related to the clinical diagnoses of autistic disorder or non-autistic disorder. Table 4:13 reveals that

more children were diagnosed with the ICD-10 and WG (Wing and Gould, 1979 criteria) than with the ICD-10 only

The results for inter-rater reliability revealed no differences in the accuracy of matching clinical diagnoses: twenty-three correct matches between clinical and algorithm diagnosis were made by both interviewers for the autistic spectrum disorder algorithm and 21 correct matches made by one researcher and 22 by the other for childhood autism algorithm. The algorithm outputs produced a high level of agreement between the two researchers with kappa coefficients for both algorithms at .82

### **Direct Observational Rating Schedule for Independent Raters**

This instrument was designed by the researcher and outlined the behaviours that comprised the dependent variable (DV); as previously stated, the purpose of the teaching material (IV) was to enhance the development of the following 8 skills:

- **Verbal expression**
- **Verbal comprehension**
- **Non-verbal comprehension**
- **Eye contact**
- **Play**
- **Adaptation to change in routine / activities (shortened to “ability to change”)**
- **Peer interaction / socialisation**
- **Listening skills**

The behaviours chosen to focus on were not randomly selected but consisted of attributes generally regarded by psychologists (Connor, 2000) to be crucial for the development of social and communication skills: it is important to note that the above 8 variables also correlated with the skill acquisition aims of the *Socially Speaking* programme and were amenable to quantitative analysis.

The recording sheets were simple and displayed the target behaviours in clear print: below each behavioural label were 200 small tick boxes for recording the number of times target behaviours occurred. A copy of the observational recording instrument has been included in the Appendix three.

### **Self-Report Schedule**

This instrument comprised 11 questions and was designed to explore the participants' concerns, attitudes, likes, dislikes and preferences in relation to school generally; the participants were assisted in completing the questionnaire, but staff deliberately avoided prompting their responses. This exercise was undertaken pre and post intervention with the SENCO acting as a scribe; this is discussed in more detail in chapter 5. The inclusion of this instrument in this thesis appears by kind permission of its original compiler Michael Connor (2000). It should be noted that the schedule was modified by the current researcher to include a simple rating scale.

## **Evaluation and Assessment Sheets**

The evaluation and assessment sheets were part of the *Socially Speaking* programme but there was no indication in the programme that the materials had been standardised; the 9 sheets in the programme cover the teaching material in all three modules and were specifically designed to measure pre and post training skills in the areas covered. Evaluation and assessment were carried out on completion of each module by teaching staff as a way of gathering evidence (or not) for skill acquisition that assisted planning. The skill areas assessed are outlined below:

- Greeting skills
- Eye contact
- Showing an interest
- Turn-taking
- Awareness of physical attributes
- Listening skills
- Sitting appropriately
- Asking / answering questions
- Using voice appropriately
- Compliments

It should be emphasised that the school-based assessment was additional to the DV measures gathered as part of the main study and related to internal school policy rather than a requirement of the current researcher: both the researcher and the raters were totally ignorant of the outcomes of these



assessments; however, following the completion of the study opinions were given by staff and correlations were made based on the results of various observations and school-based testing. These are discussed in more detail in Chapter 6.

### **C 3. Materials / Apparatus**

The materials and apparatus used in this study comprised the following:

1. Two standard Smith mechanical stop-watches that were designed to be accurate to 1/5 of a second.
2. Two single action hand held counters manufactured by Line of Japan. These could be re-set after each variable had been recorded; although not required the instruments were capable of recording from 1 – 9999 measures without having to be re-calibrated. Both instruments were manufactured by reputable companies of fine instruments and were extremely reliable and easy to use.
3. Recording sheets (see appendix 3)
4. Socially Speaking manual. This contains the 37 lesson plans with associated worksheets as well as pre and post-unit evaluation sheets.

5. **Socially Speaking board game.** This contains the game board, 2 dice, 6 game pegs, 4 sets of situation cards (25 cards in each situation for “school”, “home”, “out and about” and “socially speaking”).

#### **C 4. Training Material**

The social skills training programme used in this research study is commercially available and is called *Socially Speaking*. It comprises three units or modules that are normally delivered over three terms (a year) with one lesson each week: however, for research purposes the material was delivered to participants in two timetabled sessions each week; the full list of teaching material on which the measures were ultimately based is shown in Table 4:14 below.

**Table 4:15 Socially Speaking Modules**

<b>Session Number</b>	<b>Module 1</b>	<b>Module 2</b>	<b>Module 3</b>
	<b>Let's communicate</b>	<b>Let's be friends</b>	<b>Let's practice</b>
1.	Eye contact	Review	Review
2.	Our bodies	Happiness	Telephone calls
3.	Let's keep still	Sadness	Messages
4.	Video time	Excitement	Answerphone
5.	Looking interested	Anger	Who do I ring?
6.	Let's practice	Many emotions	Emergency
7.	Let's go shopping	What is a friend?	Our café
8.	Let's be the teacher	Friendship vouchers	Let's eat
9.	Joining conversations	How to make friends	Let's order
10.	Using our voices	Similar interests	Let's go out
11.	Myself	Keeping friends	Invitations
12.	I am unique	Friendship awards	Tea party
13.	Here I am	-	-

The overall aim of the programme was to teach the participants the following concepts:

- Greetings
- Turn-taking
- Eye contact
- Listening
- Compliments
- Emotions

- Telephoning others
- Showing an interest in what others are saying
- Sitting appropriately and still
- Asking and answering questions
- Using your voice effectively
- Developing and maintaining friendships
- Communicating in a wide variety of situations, e.g. school or friend's house.

In teaching the above concepts the aim was that the skills taught would become an integral part of the participants' behavioural repertoire and establish attributes that would otherwise be absent or at least not readily used; by practising the above skills it was hoped that the social communication skills of the participants would improve and be measurably different across the two conditions comprising Time 1 and Time 2.

### **Session Format**

Each session within the three modules followed the same format, although the actual lesson content obviously had its own unique learning aims: each session was designed for 6 individuals (participants); the mix of these groups was considered to be important and as previously stated the current researcher attempted to match the participants prior to randomly allocating them to either the experimental or control group. Although the programme was originally designed for any pupil who presented with poor social skills, it was considered by the programme author to be suitable for children with ASD (Schroeder, 2003).



The small group format allowed the participants to become familiar with each other and encouraged adherence to a set routine at the start of each lesson thereby ensuring that the participants were receptive to the teaching material presented. However, group cohesion took several weeks to achieve and the sessions were initially fairly difficult: all teaching was conducted around one large table and involved both the teacher and pupils in the various activities that comprised the programme.

## **D. PROCEDURE**

### **D 1. Submission of the research proposal**

Having secured a positive response from all those concerned in respect of the proposed study, a formal research proposal outlining the duration of the study and work to be undertaken was submitted to the Educational Committee for ethical scrutiny and approval. The design met the criteria on both ethical and scientific principles and the project was approved; on receipt of the notification of approval, the researcher met with the SENCO who arranged to contact the parents and inform them officially of the start date for the study (May 2003) and to secure their signature on the consent form (see Appendix one).

### **D 2. Engaging school managers in the research process**

The headteacher and senior staff members of the host school were approached in order to explain the broad aims and potential benefits of a study of this nature: the main case posed was that by using a comprehensive social skills

training programme to improve the social and communication skills of pupils with ASD, it was also hoped to improve their general functioning and willingness to engage in a range of tasks that they were normally reluctant to tackle. It was pointed out that previous interventions for pupils with ASD, such as, structured teaching (introduced to the school by the current researcher), had proved successful and that social skills training was an extension of these ideas with the added advantage of addressing specifically the skill deficits associated with ASD.

### **D 3. Recruitment of the Participants to the Study**

Talks took place between the current researcher and the Special Educational Needs Co-ordinator (SENCO) in which the inclusion of suitable participants was discussed: factors such as attainment levels, cognitive functioning, school attendance and behaviour were considered as important variables. Following our discussion, twelve pupils were identified who met the criteria for inclusion and so invitations were sent to the parents to attend a meeting with their son or daughter in order to discuss the proposed project.

At an initial meeting the current researcher and SENCO explained their respective roles and outlined the programme and how it was to be presented and delivered to the participants: the rationale behind the programme was explained and why it was important to empirically examine the outcome in terms of the learning objectives; all parents and participants interviewed were keen to take part in the study and readily agreed.

In accordance with ethical issues it was made clear that a research proposal would need to be officially approved by the Educational Committee and if approved no pupil would be penalised or discriminated against for not wishing to take part in the project; it was further pointed out that any participant was free to withdraw from the study before it was completed if they so wished. Additionally, it was made clear to all concerned that it was essential to secure the personal agreement of the potential participants in question in the absence of any undue pressure.

Given that individuals with ASD do not like change, reassurance and detailed explanations were provided beforehand as to what would happen in terms of teaching arrangements; parents and participants were informed that those individuals taking part would be taught in small groups for the training period, but would still attend most normal lessons as part of their general education. It was also explained that one group would start on the programme before the other: the order was not based on any particular traits of the participants, but on scientific necessity related to design features of the study. It was also explained that the second group would only receive the training if the programme proved successful for the first group.

Parents and participants were informed that in keeping with Section 8:4, page 10, of the guidelines of the British Psychological Society, results would be treated confidentially with the performance of each participant being kept anonymous; they were also told that following the conclusion of the study all parents and participants would receive debriefing in which the outcome and implications of the study would be explained.

#### **D 4. Co-ordination of the Research Process**

Following the formal agreement for the study to commence, individual teachers and SEN staff who had previously agreed to take part in the project were contacted and also informed of the official start date for the study: additionally, they were provided with further information, reassurance and a definitive promise of support throughout the period of the research.

The role of the independent raters was explained and a training programme was set-up for the six volunteers; the criteria for the 8 target behaviours were explained and a two week intensive training period commenced in which raters practised recording each of the 8 target behaviours in real classroom settings: within this framework there followed a discussion between the researcher and the raters at the end of each practice session in order to clarify any issues; however, the training period was uneventful and generally few issues were identified.

Care was taken to provide consistent instructions to the raters and other staff involved in the study; in the case of the English subject teachers (lessons in which measures were made), it was emphasised that the participants should not be treated differently from their peers within the regular class: in other words, the teachers should not deliberately try to tease out particular behaviours as a way of trying to be helpful. This situation was to some extent avoided by the fact that although the teachers knew that some participant behaviours were being measured, they were not fully aware of the extent and differences; indeed, only the SENCO and researcher had precise knowledge of



the IV and DV and as previously stated, others were in effect “blind” to precisely what was happening.

#### **D 5. Measuring Procedures Undertaken by the Researcher**

Each participant in the study was assessed by the current researcher using the Wechsler Intelligence Scale for Children (WISC-III) and the Wechsler Objective Reading Dimensions (WORD); however, in order to ensure that previous testing did not invalidate re-testing, a six month period had to have elapsed before further assessment was undertaken by the researcher. The data yielded from this exercise were used to provide a more complete profile of each participant, but when used in conjunction with existing data (from their files and school notes) proved helpful when matching the participants prior to the randomisation process of group selection.

The DISCO was used as a clinical aid to confirm diagnostic criteria; although all participants had been diagnosed by highly competent professionals the DISCO did act as an aid in confirming the diagnosis (given that symptoms vary over relatively short periods of time). It was previously pointed out that the DISCO diagnostic criteria are based on the ICD-10. The current researcher was trained by Drs Wing and Gould to use the instrument in the year 2000: the profiles of the participants on the DISCO did support the diagnosis of ASD in all cases.

## **D 6. Measuring Procedures Undertaken by School-based Staff**

The SENCO completed the Self-Report Schedule both pre and post study in the presence of each participant: she also completed the Evaluation and Assessments Sheets as part of the school policy. The Independent Raters were responsible for recording the dependent measures using the Direct Classroom Observation Schedule.

## **D 7. Baseline Measures**

Pre-intervention was previously referred to, but in less detail than currently outlined: the participants were measured in parallel at what was essentially a baseline condition: the recordings took place within a double English lesson of 90 minute duration twice weekly: this particular lesson was chosen because pupils were regularly assessed for three attainment targets (reading, writing, speaking / listening) in this subject. These areas were clearly applicable to the target behaviours being assessed.

Each participant was exposed to the same classroom conditions (including the same teacher) with the 8 dependent variables (shown below) being recorded throughout a six week baseline period. The duration of the recordings was equivalent to 4 x 45 minute sessions each week.

- Verbal expression
- Verbal comprehension
- Non-verbal comprehension

- Eye contact
- Play
- Adaptation to change in routine / activities
- Peer interaction / socialisation
- Listening skills

On completion of the weekly measures the data sheets were passed to the SENCO who then handed them to the researcher; it was expected that by adopting this strategy raters would not develop preconceived ideas about what to expect at the measuring points: with this in mind, it is important to point out that the Independent Raters were unaware that a comparative study was taking place and were “blind” to the notion of a two-group situation; moreover, although part of a large Special Needs team (22 Support Assistants), they were not employed as small group assistants. Approximately 250 pupils received regular Learning Support help in small group situations and this was accepted as normal practice in the school. In other words, nothing out of the ordinary was occurring between the participants as far as the Independent Raters were concerned and bias in measures was considered extremely unlikely.

#### **D 8. Allocation of Groups to Treatment or Non-Treatment**

Having been previously matched in pairs the participants were randomly (using random number tables) assigned to group A or B; the two groups were then randomly allocated to either the experimental or control condition. As was previously stated Group A received the treatment and Group B acted as the non-treatment control.

Throughout this project the SENCO delivered all teaching material associated with the social skills training programme in the study: she was the only person, apart from the current researcher, who was fully aware of the programme contents and the overall aim of the research. The full teaching materials and the format of each lesson were outlined earlier in this chapter. Each lesson lasted 90 minutes and always adhered to the recommended structure and procedures as outlined in the training manual; the same materials and teacher were used within a prescribed format.

At the start of each lesson the SENCO called the participants into the learning support room and gained their attention: this arrangement applied initially to Group A, but was later continued for Group B; in the case of both groups the participants were allowed to sit according to their own preference, with the proviso that they maintained that particular place throughout the training. The only restriction was that they were all seated around one large table facing a large whiteboard. The format for each particular lesson was clearly written out on the whiteboard in accordance with the requirements for each session. The following is offered as an example:

**Figure 4:3 Example of Teaching Session for Eye Contact**

<b>Session 1</b>	<b>Eye Contact</b>
1.	Greetings
2.	Introduction
3.	Game (winking)
4.	Discussion
5.	Role play and questions
6.	Pupil activity
7.	Worksheet (my eye)
8.	Compliments

Within the above framework the SENCO worked through all 8 points and actively engaged each participant. In the case of point 1 each participant had to greet his or her peer (working around the group in a clockwise direction). For instance:

*“James, how are you today?”*

*“I am happy because I played with Brian at play break today.”*

This procedure was continued around the table until everyone in the group had a turn; where the participants struggled with the task, the group leader (teacher) often needed to suggest some words that referred to feelings; such as, sad, happy, excited, worried or anxious thus:

*“I am anxious because I am not sure what to do next.”*

or



*"I am excited because I am going to see my cousin at the week-end".*

## **Game**

Each session had an associated programme game that was designed to reinforce skills learned in the target areas (outlined above); in the example cited above the overall target behaviour (to be learned) was eye contact. After the greetings session had been completed the pupils selected one of their group members to leave the classroom. From the remaining group a leader was selected to become what is termed the "winker". When the pupil (who left the classroom) came back into the group he or she stood in the middle of the group and had to guess who the winker was; meanwhile, the "winker" made eye contact with the other pupils and winked at them in a random fashion. Those winked at responded by immediately pretending to fall asleep; when the "winker" was discovered he or she then took their turn to leave the classroom and in this way the procedure was repeated.

Another example of a game was called "Mirrors". In this game the participants were organised into pairs; one pretended to be a mirror whilst the other made actions with their body and face that the mirror had to immediately copy (model); this game was essentially used to encourage facial and body awareness, but in addition shaped-up turn-taking skills, co-operation, tolerance of proximity and timing.

A third example was a game called "Alphabet Shopping". In this game each participant had to refer to a hypothetical object that he or she bought from a supermarket: each item had to start with each letter of the alphabet in turn thus:

"I went to the shop and I bought: apple, banana, cake, dog food, eggs, fish, grapes," and so on.

At the end of a lesson a further exercise was implemented that consisted of a board game designed to complement the programme; all players were required to place their pieces on the *Start* square in the middle of the board and take turns to roll the dice. The participant with the highest number started the game; for consistency the game proceeded in a clockwise direction with each player taking his or her turn. The game also had a number of strategically placed squares on the board, when a player landed on one of these squares he or she had to answer a question or complete a task according to instructions on one of five types of squares thus:

1. Statement completion
2. Questions
3. Emotions
4. Compliments
5. Situations

From the above five different types of squares, a very important one was entitled "Situation". There are four types of "Situations" that the participants had

to learn to deal with (depending on the particular one they landed on). These were as follows:

1. Home
2. School
3. Out and About
4. Socially Speaking

On landing on one of the situation squares the pupil was required to take the relevant category of situation card and respond appropriately to the instructions on it; these related to either a home, school, out and about or a socially speaking situation.

### **Review / Discussion / Questioning**

Following the greetings and game the previous session was then reviewed through questions and discussion; after each session's theme was introduced (eye contact, turn-taking, making friends) the theme was discussed and role played by the teacher who then followed this with questions:

1. Why do we need to make eye contact when we speak to other people?
2. Why is it important to take-turns when we play a game with others?
3. How would you start to make friends with someone?

Clearly the above were designed to encourage appropriate behaviour and problem solving in relation to communication.

## **Role Play**

The participants practised what had been discussed and role played by the teacher: they then attempted to act out appropriate and inappropriate ways of dealing with particular situations. The rest of the participants then had the task of identifying the behaviours demonstrated or exhibited.

## **Worksheets**

Worksheet activities were designed to reinforce the learning that had taken place in the lesson, although not all sessions had an accompanying worksheet: where one was present each participant completed it often with some help from the teacher. Some of the activities covered by the worksheets consisted of the following:

- A colouring task related to identifying the colour and parts of the eye.
- Participants were required to seek information about a group member and record it.
- Participants had to put words into bubbles spoken by cartoon characters.
- Design a newspaper item and read it to his or her peers.
- A word search, that is, finding embedded words related to listening skills (see example below).

**Figure 4:4 Example of an Exercise Related to Listening Skills**

***Listening Word Search***

X S T I L L  
V H L O O K  
L I S T E N  
C N O D V J  
S M I L E K  
Z X E Y E S

***Can you find our good listening skills?***

The above tasks were interactive and regarded as fun by the participants; it was also claimed that generalisation to curricular areas such as reading, writing, speaking and listening occurred as a result (Schroeder, 2003).

### **Compliments**

At the end of each session, each pupil was required to give the individual on his or her left a compliment. The teacher prepared a number of different compliments such as:

- Friendly
- Kind
- Helpful
- Caring



- Generous
- Smiley
- Considerate
- Good listener
- Polite

These terms were placed on cards and displayed in front of the pupils as discussion topics: for instance, when they should be used and by whom and the reason for using a compliment is stressed thus:

*“Daniel, I think that you are generous because you gave me some of your chocolate.”*

The teacher made a compliment chart which contained the comments made by participants to each other thus:

**Figure 4:5 Compliment Chart**

Compliment Chart	Socially Speaking
J. X.	Helpful
S. Y.	Thoughtful
D. Z.	Kind

All participants in the group were included in the compliment chart; the use of this process in a structured situation was considered to be beneficial in terms of developing organisational skills, confidence, understanding and social awareness.

## **Assessment**

Before each module was employed with the participants a pre-unit assessment sheet was completed thus enabling the teacher to measure present skill levels: this required some probing on the part of the teacher in respect of current skills; the language used in the formulation of the sheets was easy to understand and facilitated discussion between participants and teacher. Each participant was marked as:

C – Competent

H – Needs help

Following the delivery of each of the three modules the teacher completed a post delivery assessment and evaluation sheet: in this way learned skills could be identified, recorded and matched against the aims of each unit. As in the pre-unit assessment the post unit assessment sheets were discussed with each participant who was given feedback.

Care was taken in completing the pre and post assessment, which was based on observations in group situations such as playtimes, class discussion and other social situations; whilst it may appear relatively easy to determine whether or not an individual was able to respond appropriately, there is the problem of being able but unwilling to do so. It was therefore necessary to determine whether or not failure was situational (just inhibited in the dining room) but not in others locations.

## **CHAPTER FIVE: RESULTS**

The initial focus of the chapter is on presenting evidence that demonstrates that important parametric assumptions were not violated in respect of the data presented in this study: some Tables relevant to these data that do not appear in the text have been included in Appendix five. In the second part of the chapter the statistical analysis is discussed with both parametric and non-parametric data also appearing in the appendices together with a small section devoted to important ethical research issues.

### **A. PRECURSORY DATA ANALYSIS AND STATISTICAL SELECTION**

#### **A 1. Data Assumptions**

It is clearly very difficult to predict with any degree of accuracy the characteristics of a novel sample of individuals with ASD: in view of this, it was considered essential to conduct a preliminary analysis of the data to ensure that necessary and important assumptions were met in relation to the use of parametric statistics. In effect, it was necessary to ensure that the sample conformed to certain criteria as a prerequisite for the use of parametric statistics. The assumptions referred to above included:

- 1. Interval or ratio data for the dependent variables**
- 2. Normality of distribution**
- 3. Homogeneity of variance**
- 4. Sphericity**

## **A 2. Interval Data**

The dependent measures were clearly interval in nature, since all possessed equal intervals between scores on a numerical scale: that is, a participant demonstrating three examples of eye contact at one measuring point (Time 1) and a further six at a second measuring point (Time 2) exactly doubled his or her tally of scores between the two measuring points. Likewise, an absence of eye contact between Time 1 and Time 2 would clearly warrant a zero rating: a scale with a zero and equal intervals is by definition *interval data*; however, in a real situation (as opposed to a hypothetical one) if just two values for eye contact were recorded, then this would be categorical data.

## **A 3. Normality of Distribution**

In order to demonstrate normality of distribution for the dependent scores the test statistics for the dependent variables showing Time 1 and Time 2 have been included in the Appendix five. In all cases the tests for abnormality of distribution proved to be non-significant ( $p > 0.05$ ): on this basis, the current researcher considered that the difficulties associated with small samples in relation to normality of distribution were not sufficient to invalidate the use of parametric statistics.

## **A 4. Homogeneity of Variance**

The reader is advised that a summary table showing the results of Levene's test of homogeneity of variance for the 8 dependent variables has been included in

Appendix five; each variable was compared against the independent variable at two time points (Time 1 and Time 2). The upper scores refer to the first measuring point (Time 1) whilst the lower the second measuring point (Time 2): from the outcome it can be seen that the results were not significant ( $p > 0.05$ ); this meant that the variability of scores was similar, and it was therefore concluded that the groups had approximately equal variance.

Having made the above claim, the present researcher recognised that small samples are problematic when making claims in respect of homogeneity of variance: this is because they do not always contain enough examples of variance to be sure; however, an inspection of the data did indicate that this assumption was not violated.

## **A 5. Sphericity**

The research design used in this study employed two measuring points: in view of this it was not considered necessary to test specifically for sphericity; in fact, this would have been a pointless exercise because as Field, (2005) points out: "You need at least three conditions for sphericity to be an issue".

## **A 6. Research Approaches Adopted**

Both quantitative as well as qualitative methods were used to analyse results: however, the focus in the text has been placed on the former approach. This does not mean that the qualitative data were necessarily less valued: in fact, as far as the teachers were concerned, they were instrumental in bringing about



important changes within school-based systems that was beneficial to all concerned

## **A 7. Statistical Selection**

The statistical approach adopted in any study cannot simply be a straightforward choice or personal preference, but to a large extent is subject to the nature of the data and whether parametric assumptions were met.

The preliminary data analysis outlined in the previous section was judged to have provided sufficient evidence to justify the use of parametric tests as the main focus for the analysis of data; the assumptions underlying parametric statistics were met and therefore provided an opportunity to use t-tests to compare difference in change scores between Groups A and B.

As stated above, the results of statistical tests were used to assess the interactions between variables; all statistical analyses were performed on a two-tailed basis with significance set at  $p = 0.01$ . Analysis was carried out using SPSS 14 for Windows XP.



## B. DESCRIPTIVE STATISTICS

### B 1. Verbal Expression

**Table 5:1 Graph Showing Time Change Scores for Verbal Expression Following Treatment for Group A**

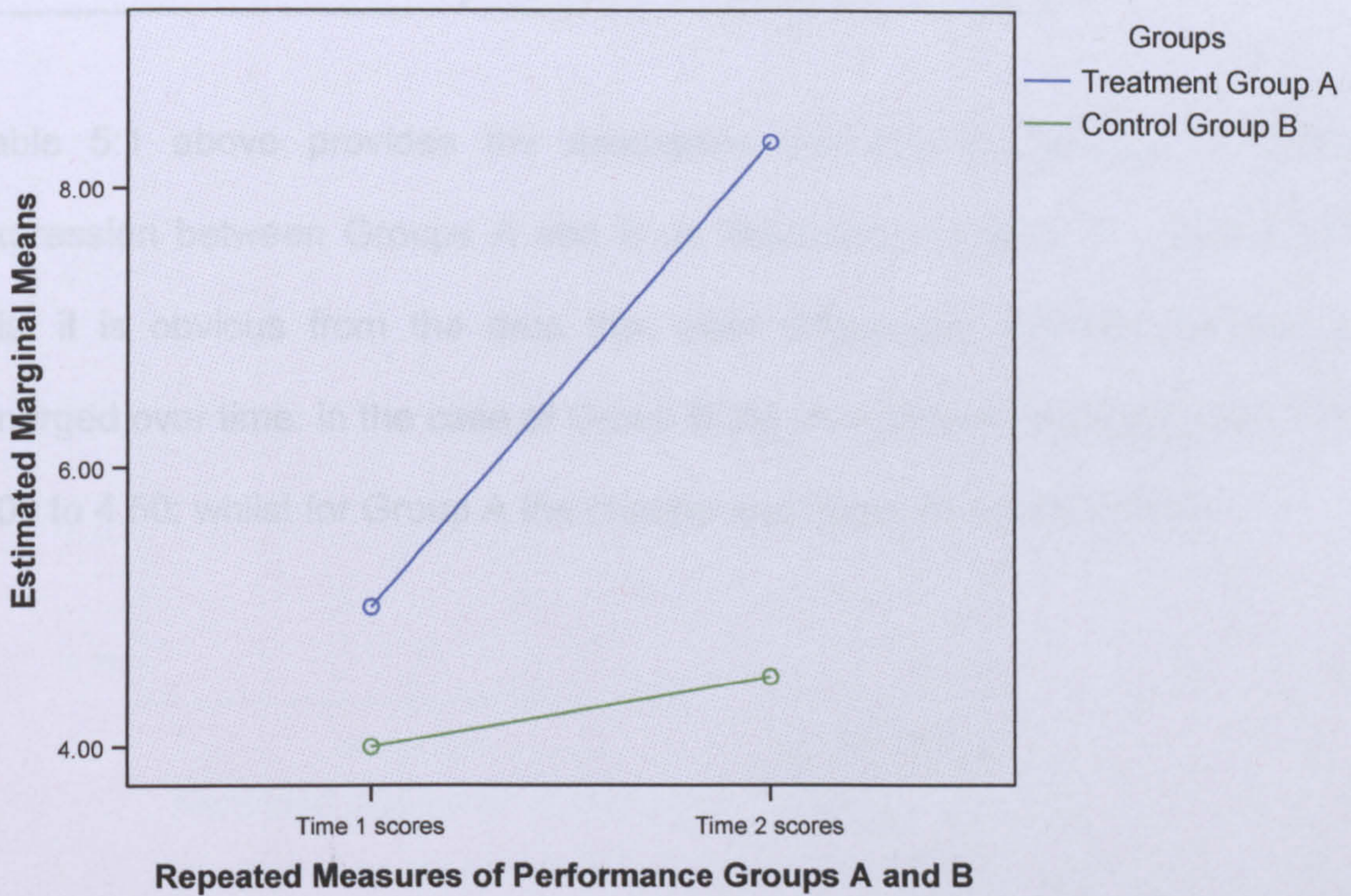


Figure 5:1 shows graphically the mean scores for Verbal Expression for both groups between two time points: an inspection of the data clearly reveals that whilst the mean scores for both groups were similar at Time 1, the situation at Time 2 was very different with an obvious divergence of mean scores. The significance of this change is clearly important and is discussed in the next section that deals with the inferential statistics.



**Table 5:1 Descriptive Statistics for Verbal Expression at Time 1 and Time 2 for Groups A and B**

**Descriptive Statistics**

	group	Mean	Std. Deviation	N
Verbal Expression 1	Group A	5.0000	1.41421	6
	Group B	4.0000	1.41421	6
	Total	4.5000	1.44600	12
Verbal Expression 2	Group A	8.3333	1.21106	6
	Group B	4.5000	1.04881	6
	Total	6.4167	2.27470	12

Table 5:1 above provides the descriptive statistics for change in Verbal Expression between Groups A and B as illustrated in Figure 5:1. In line with this, it is obvious from the data that clear differences between the groups emerged over time: in the case of Group B the change was relatively small,  $M = 4.00$  to  $4.50$ ; whilst for Group A the change was large:  $M = 5.00$  to  $8.33$ .



## B 2. Verbal Comprehension

**Figure 5:2 Graph Showing Time Change Scores for Verbal Comprehension Following Treatment for Group A**

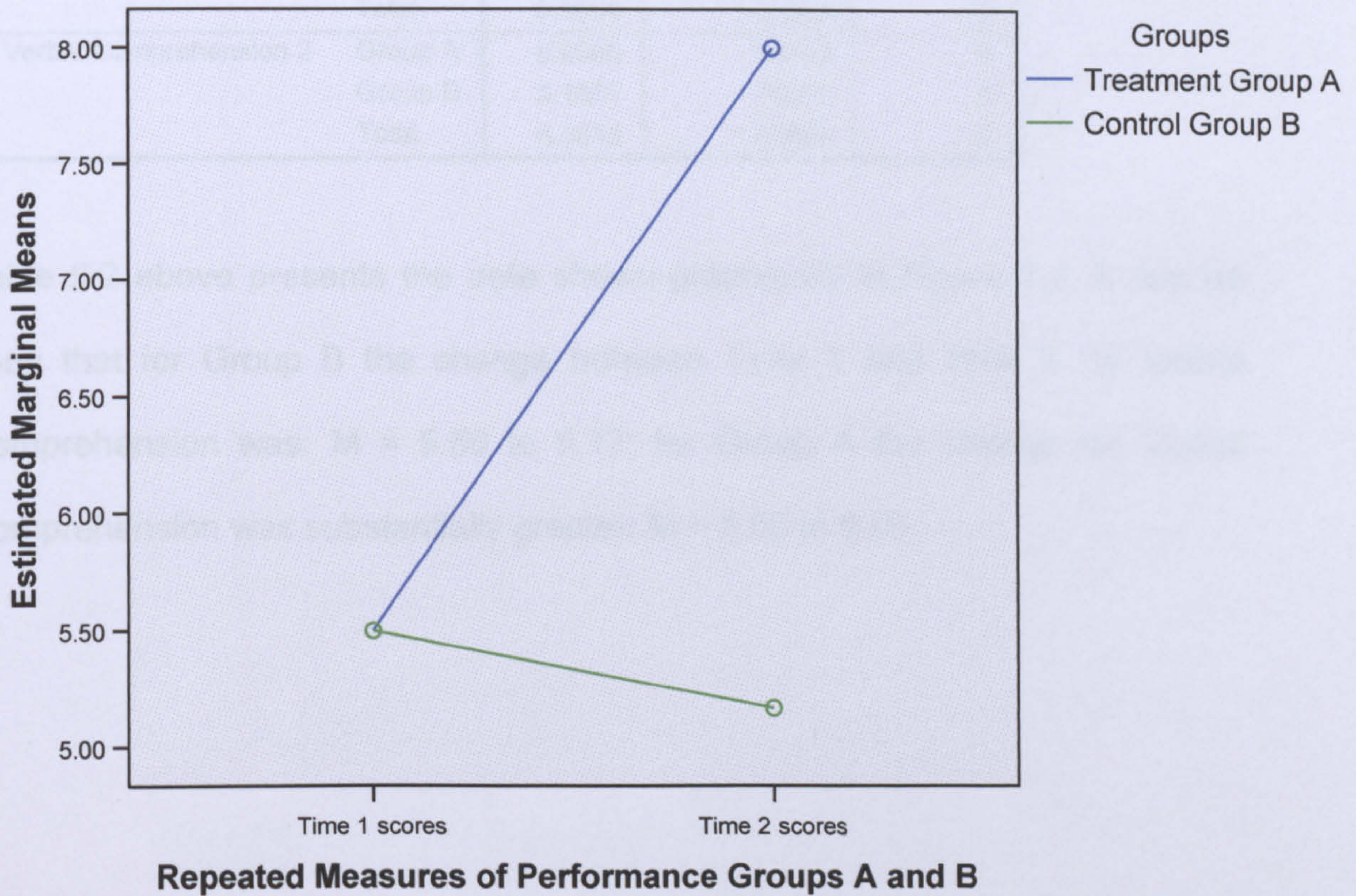


Figure 5:2 above shows the mean scores for Verbal Comprehension for Groups A and B at Time 1 and Time 2; as can be seen from the plot at Time 1 the scores for both groups were equal. At Time 2 there had been a small drop in the recorded measure for Group B and a large increase in the mean score for Group A.



**Table 5: 2 Descriptive Statistics for Verbal Comprehension at Time 1 and Time 2**

**Descriptive Statistics**

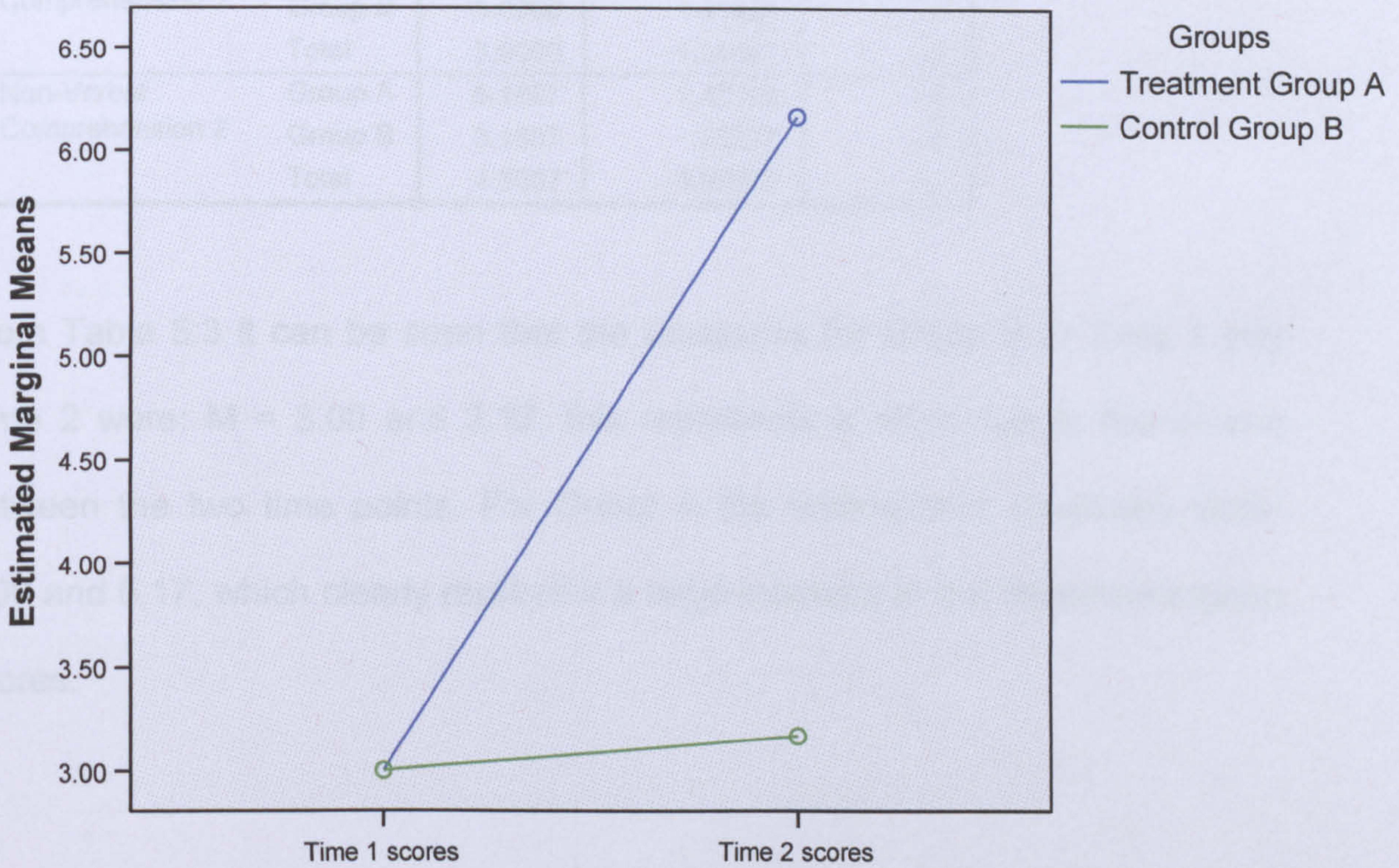
	group	Mean	Std. Deviation	N
Verbal Comprehension 1	Group A	5.5000	1.04881	6
	Group B	5.5000	1.04881	6
	Total	5.5000	1.00000	12
Verbal Comprehension 2	Group A	8.0000	.89443	6
	Group B	5.1667	.75277	6
	Total	6.5833	1.67649	12

Table 5:2 above presents the data shown graphically in Figure 5:2. It can be seen that for Group B the change between Time 1 and Time 2 for Verbal Comprehension was:  $M = 5.50$  to  $5.17$ ; for Group A the change for Verbal Comprehension was substantially greater:  $M = 5.50$  to  $8.00$ .



### B 3. Non-Verbal Comprehension

**Figure 5:3 Graph Showing Time Change Scores for Non-Verbal Comprehension Following Treatment for Group A**



**Repeated Measures of Performance Groups A and B**

It can be seen from Figure 5:3 above that at Time 1 the dependent measures were identical; at Time 2 the situation regarding both groups had changed with a clear divergence between the mean scores for Groups A and B. Table 5:3 below provides a numerical account for data displayed in the above plot.



**Table 5:3 Descriptive Statistics for Non-Verbal Comprehension at Time 1 and Time 2**

**Descriptive Statistics**

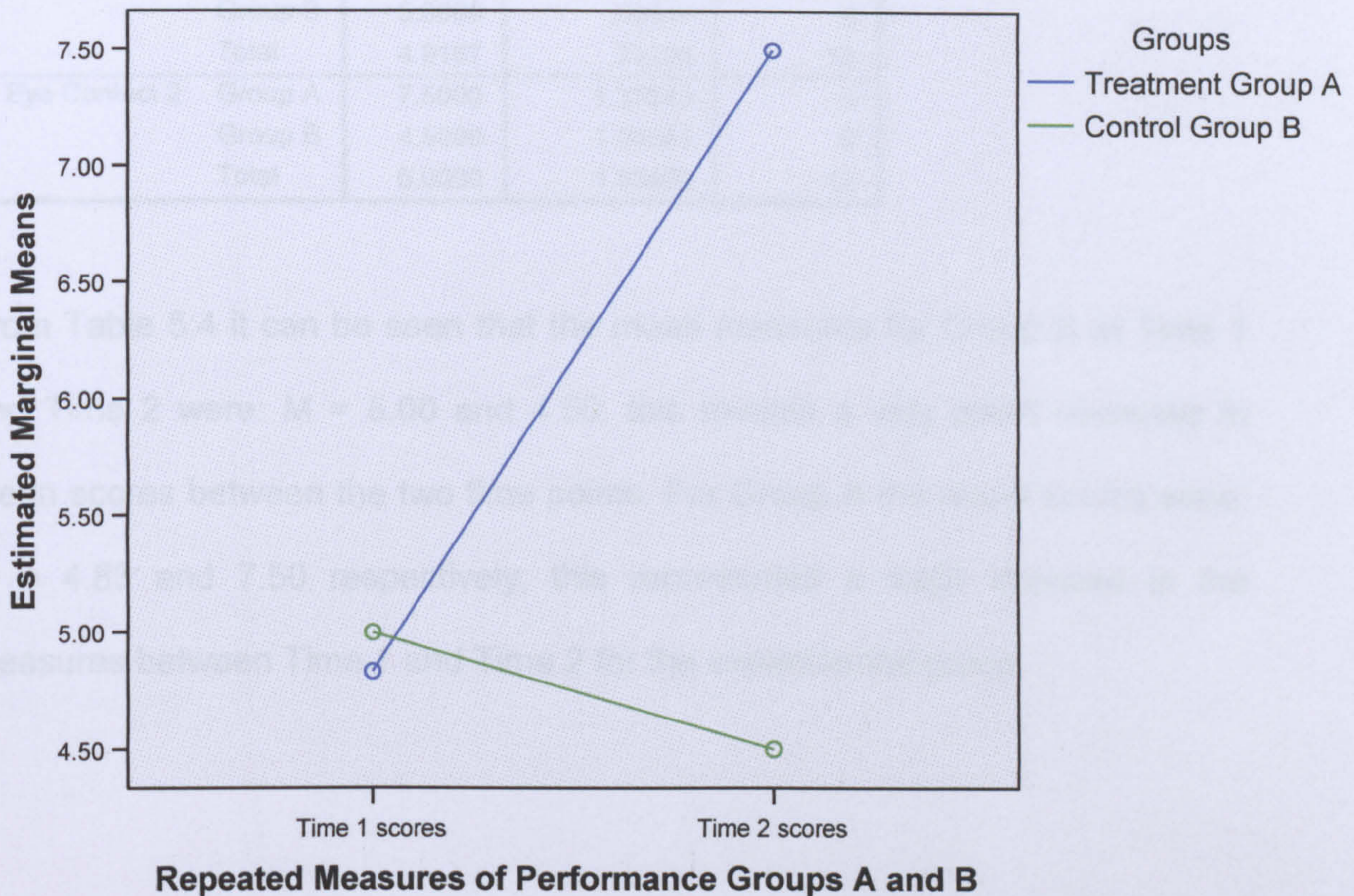
	group	Mean	Std. Deviation	N
Non-Verbal Comprehension 1	Group A	3.0000	.63246	6
	Group B	3.0000	1.41421	6
	Total	3.0000	1.04447	12
Non-Verbal Comprehension 2	Group A	6.1667	1.47196	6
	Group B	3.1667	.75277	6
	Total	4.6667	1.92275	12

From Table 5:3 it can be seen that the measures for Group B at Time 1 and Time 2 were:  $M = 3.00$  and  $3.17$ , this represents a small rise in the means between the two time points. For Group A the comparative measures were:  $3.00$  and  $6.17$ , which clearly represent a large increase in the dependent mean scores.



## B 4. Eye Contact

**Figure 5:4 Graph Showing Time Change Scores for Eye Contact Following Treatment for Group A**



From Figure 5:4 above it is clear that at Time 1 the dependent measures for Groups A and B were almost identical; the situation between the groups at Time 2 had, however, changed considerably with Group A showing a substantial mean increase in scores. Table 5:4 below provides a numerical account for the data illustrated above.



**Table 5:4 Descriptive Statistics for Eye Contact at Time 1 and Time 2**

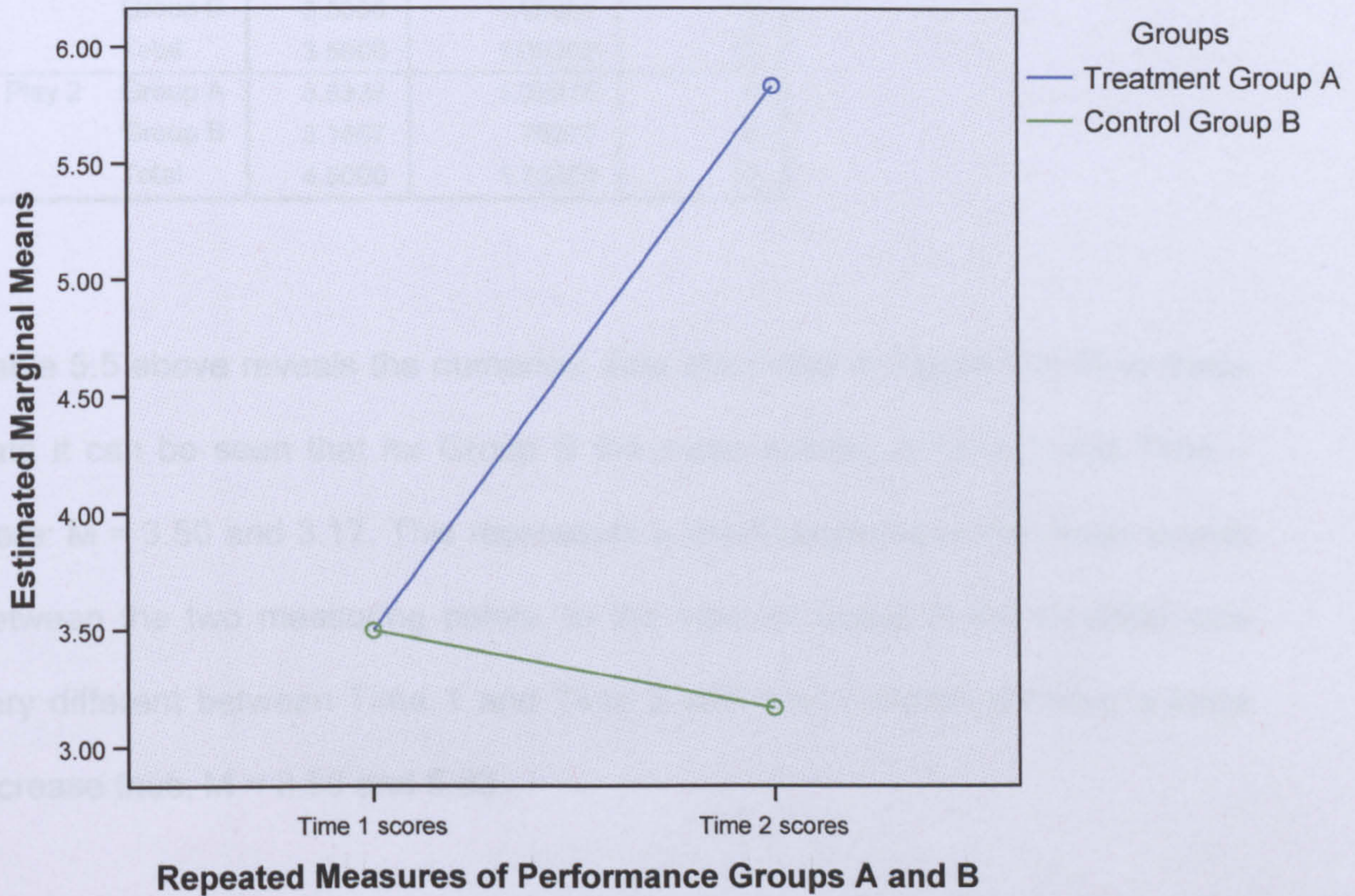
**Descriptive Statistics**

	group	Mean	Std. Deviation	N
Eye Contact 1	Group A	4.8333	.75277	6
	Group B	5.0000	.89443	6
	Total	4.9167	.79296	12
Eye Contact 2	Group A	7.5000	1.37840	6
	Group B	4.5000	1.04881	6
	Total	6.0000	1.95402	12

From Table 5:4 it can be seen that the mean measures for Group B at Time 1 and Time 2 were:  $M = 5.00$  and  $4.50$ , this reveals a very small decrease in mean scores between the two time points. For Group A the mean scores were:  $M = 4.83$  and  $7.50$  respectively; this represented a large increase in the measures between Time 1 and Time 2 for the experimental group.



Figure 5:5 Graph Showing Time Change Scores for Play Following Treatment for Group A



From Figure 5:5 above it can be that the mean dependent scores for Groups A and B at Time 1 were equal; at Time 2 there was clearly a marked separation of mean scores between the two time points, with Group A showing a large increase over Group B.



**Table 5:5 Descriptive Statistics for Play at Time 1 and Time 2****Descriptive Statistics**

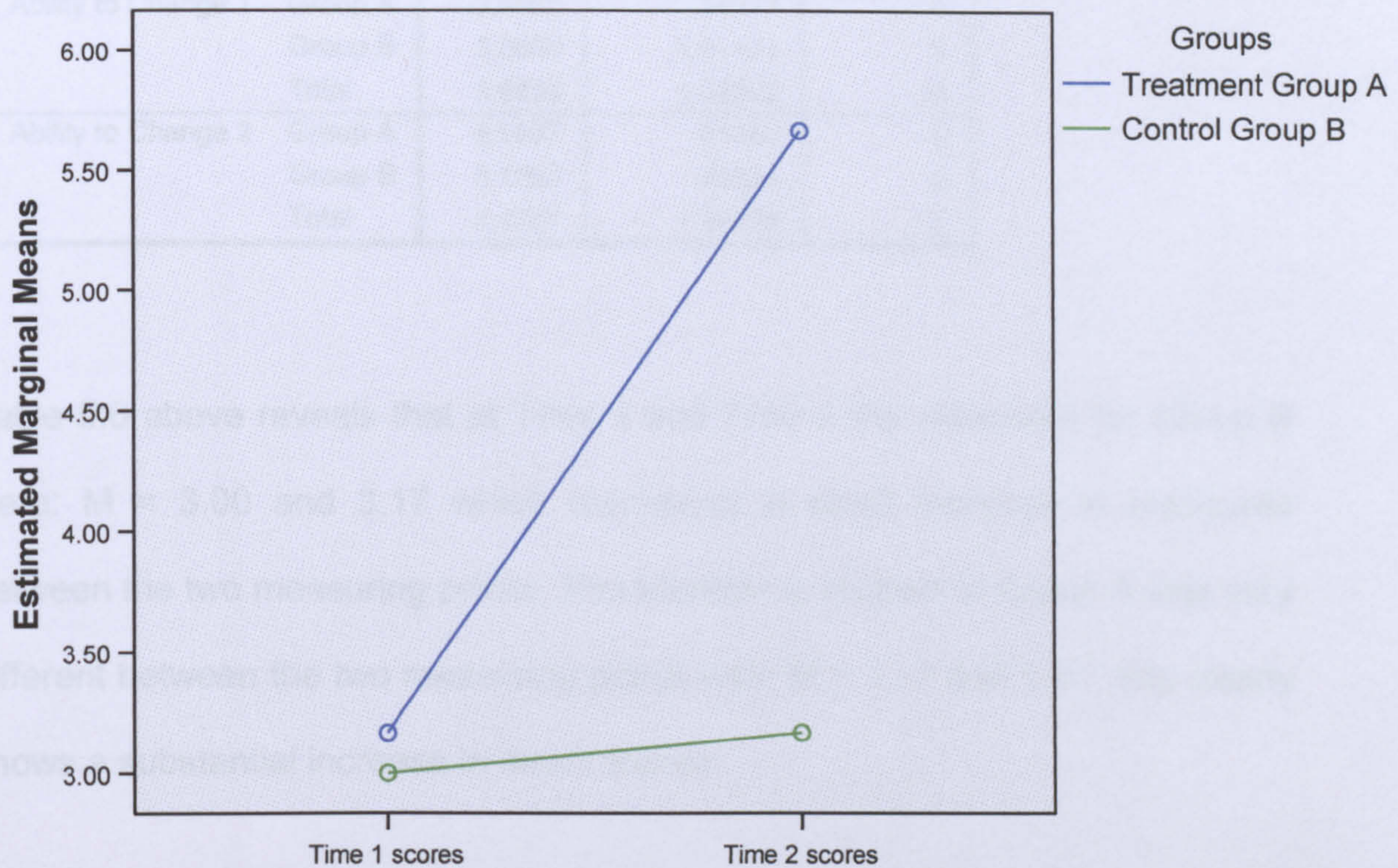
	group	Mean	Std. Deviation	N
Play 1	Group A	3.5000	1.04881	6
	Group B	3.5000	1.04881	6
	Total	3.5000	1.00000	12
Play 2	Group A	5.8333	1.32916	6
	Group B	3.1667	.75277	6
	Total	4.5000	1.73205	12

Table 5:5 above reveals the numerical data illustrated in Figure 5:5; from these data it can be seen that for Group B the mean scores at Time 1 and Time 2 were:  $M = 3.50$  and  $3.17$ . This represents a small decrease in the mean scores between the two measuring points. In the case of Group A the situation was very different between Time 1 and Time 2 with mean scores showing a large increase thus:  $M = 3.50$  and  $5.83$ .



## B 6. Ability to Change

Figure 5:6 Graph Showing Time Change for Ability to Change Following Treatment for Group A



Repeated Measures of Performance Groups A and B

Figure 5:6 above shows that at Time 1 the mean dependent scores between Groups A and B were approximately equal; at Time 2 a clear divergence between the mean scores for Groups A and B had occurred. Table 5:6 below provides a numerical account of the changes illustrated above.



**Table 5:6 Descriptive Statistics for Ability to Change at Time 1 and Time 2**

**Descriptive Statistics**

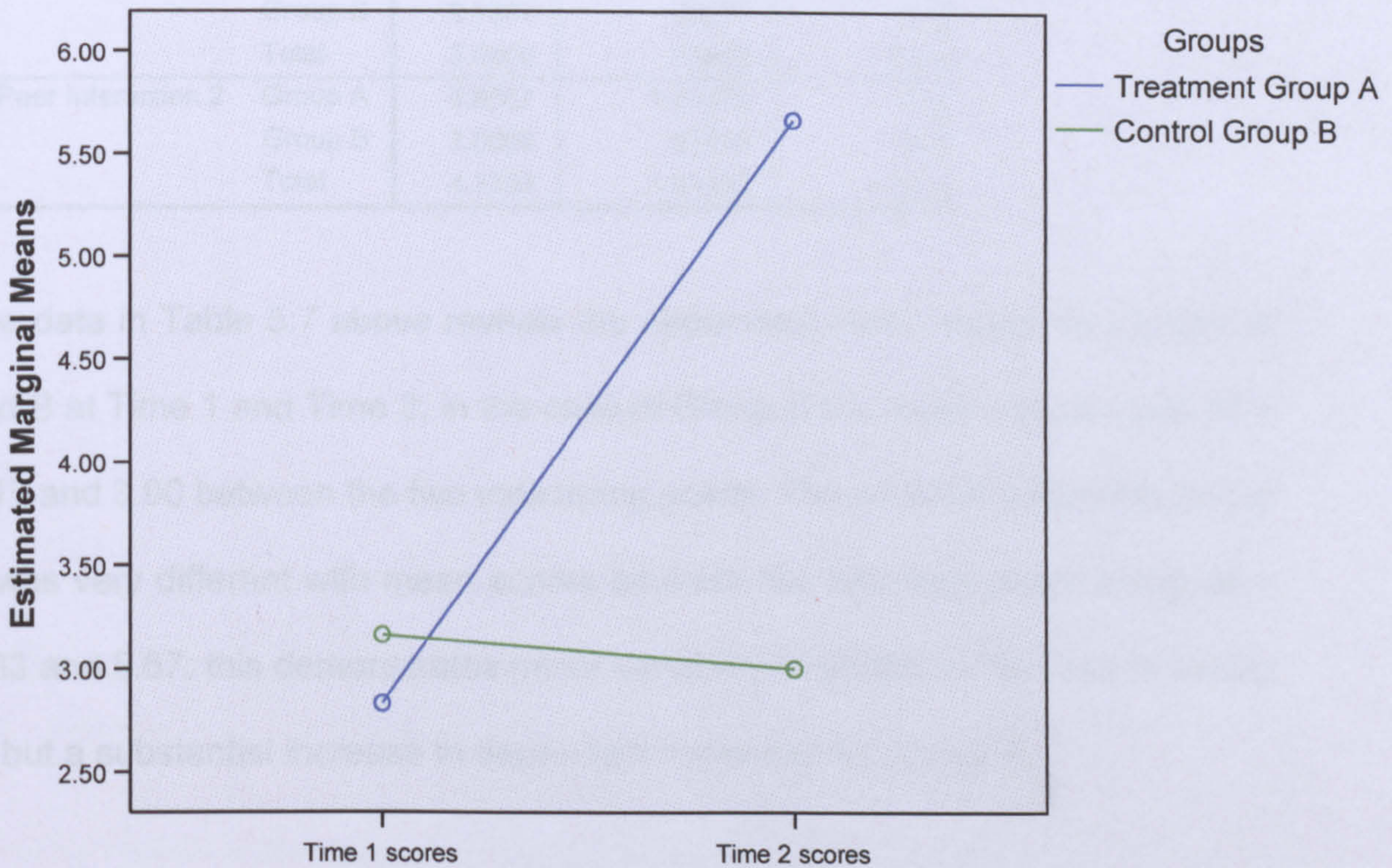
	group	Mean	Std. Deviation	N
Ability to Change 1	Group A	3.1667	.75277	6
	Group B	3.0000	1.41421	6
	Total	3.0833	1.08362	12
Ability to Change 2	Group A	5.6667	.81650	6
	Group B	3.1667	.40825	6
	Total	4.4167	1.44338	12

Table 5:6 above reveals that at Time 1 and Time 2 the measures for Group B were:  $M = 3.00$  and  $3.17$  which represents a small increase in measures between the two measuring points. The situation in respect of Group A was very different between the two measuring points with:  $M = 3.17$  and  $5.67$ ; this clearly shows a substantial increase in mean scores.



## B 7. Peer Interaction

**Figure 5:7 Graph Showing Time Change Scores for Peer Interaction Following Treatment for Group A**



**Repeated Measures of Performance Groups A and B**

It can be seen from Figure 5:7 above that at Time 1 the mean dependent scores for Groups A and B were very similar; at Time 2 the mean scores between the groups had changed considerably, with Group A undergoing a substantial increase over Group B.



**Table 5:7 Descriptive Statistics for Peer Interaction at Time 1 and Time 2**

**Descriptive Statistics**

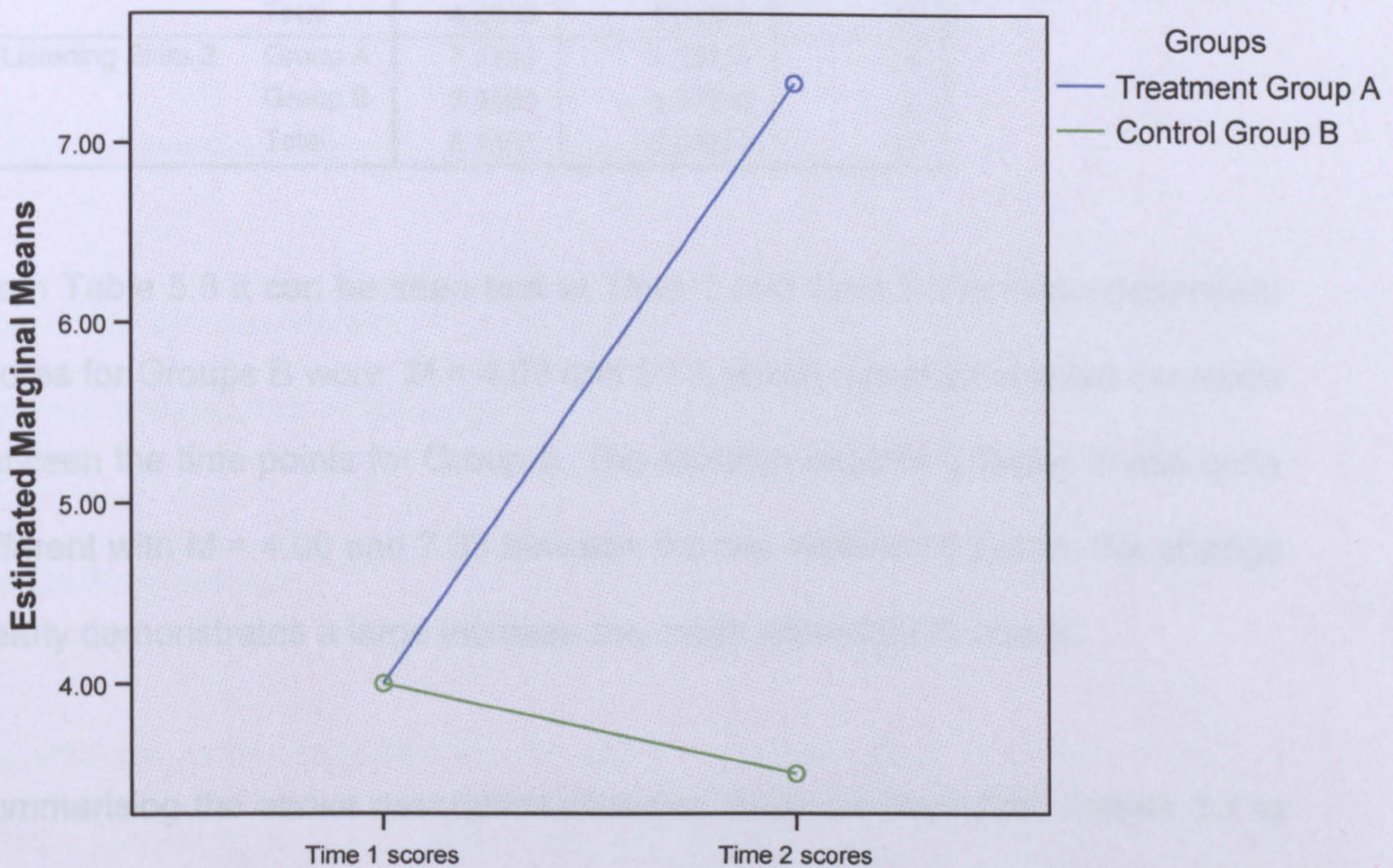
	group	Mean	Std. Deviation	N
Peer Interaction 1	Group A	2.8333	.75277	6
	Group B	3.1667	.75277	6
	Total	3.0000	.73855	12
Peer Interaction 2	Group A	5.6667	1.03280	6
	Group B	3.0000	.63246	6
	Total	4.3333	1.61433	12

The data in Table 5:7 above reveals the dependent mean scores for Groups A and B at Time 1 and Time 2; in the case of Group B the mean scores were: M = 3.17 and 3.00 between the two measuring points. The situation regarding Group A was very different with mean scores between the two time points being: M = 2.83 and 5.67: this demonstrates minor variability of scores in the case of Group B, but a substantial increase in dependent measures for Group A.



## B 8. Listening Skills

**Figure 5:8 Graph Showing Time Change Scores for Listening Skills Following Treatment for Group A**



**Repeated Measures of Performance Groups A and B**

It can be seen from Figure 5:8 that the dependent measures for Groups A and B were identical at Time 1; however, at Time 2 the relationship between the groups had changed considerably, with a clear divergence between the groups in terms of mean scores. Table 5:8 below shows the change in numerical form between the two scoring points.



**Table 5:8 Descriptive Statistics for Listening Skills at Time 1 and Time 2**

**Descriptive Statistics**

	group	Mean	Std. Deviation	N
Listening Skills 1	Group A	4.0000	1.41421	6
	Group B	4.0000	1.41421	6
	Total	4.0000	1.34840	12
Listening Skills 2	Group A	7.3333	1.75119	6
	Group B	3.5000	1.37840	6
	Total	5.4167	2.50303	12

From Table 5:8 it can be seen that at Time 1 and Time 2 the mean dependent scores for Groups B were:  $M = 4.00$  and  $3.50$ , which represent a small decrease between the time points for Group B. The situation regarding Group A was quite different with  $M = 4.00$  and  $7.33$  between the two measuring points: this change clearly demonstrates a large increase the mean scores for Group A.

Summarising the above descriptive statistics, it can be seen from Tables 5:1 to 5:8 that at Time 1 the mean scores for Group A and B were very similar; however, at Time 2 a clear difference emerged between the groups, whilst the mean scores for Group B (control group) remained relatively unchanged with only minor variations, those for Group A (treatment group) were greater than at Time 1 (baselines) measures for both groups. From Figures 5:1 to 5:8 the differences are clearly illustrated: the question of whether or not the observed difference between the groups was statistically significant is explored in the next section.

### **C. INFERENCE STATISTICAL ANALYSES**

In order to test for statistical difference between intervention (Group A) and change (Group B), group change scores were calculated for each participant by

subtracting Time 1 from Time 2 for each dependent variable. Normality of distribution of the resulting data was checked before proceeding to a *t*-test to investigate differences between group change means. In the following sections, change scores for each dependent variable in turn are described and analysed.

### **C 1. Null Hypothesis for Research Question One**

*There will be no difference in the social, communication and thinking skills between participants in the intervention versus the non-intervention conditions.*

#### **Verbal Expression**

The change in mean scores for Groups A and B for Time 2 – Time 1 was as follows: Group A,  $M = 3.33$ ,  $SD = .52$ , Group B,  $M = .50$ ,  $SD = .84$ ,  $t = 7.06$ ,  $df = 10$ ,  $p < .001$ . From these data it is clear that the magnitude of change between Groups A and B was highly significant.

#### **Verbal Comprehension**

The analysis of data for Groups A and B revealed the following change for Time 2 – Time 1: Group A,  $M = 2.50$ ,  $SD = .55$ , Group B,  $M = -.17$ ,  $SD = .75$ ,  $t = 7.02$ ,  $df = 10$ ,  $p < .001$ . As can be seen, the change between group mean scores was highly significant.

## **Non-Verbal Comprehension**

The resulting analysis of change for Groups A and B for Time 2 – Time 1 showed the following: Group A,  $M = 3.17$ ,  $SD = 1.47$ , Group B,  $M = .17$ ,  $SD = 1.47$ ,  $t = 3.53$ ,  $df = 10$ ,  $p < 0.01$ . From the data it is clear that the change was significant.

## **Eye Contact**

Mean score changes in Eye Contact between Groups A and B, Time 2 – Time 1 were: Group A,  $M = 2.67$ ,  $SD = 1.03$ , Group B,  $M = -.50$ ,  $SD = .55$ ,  $t = 6.64$ ,  $df = 10$ ,  $p < 0.01$ . It is apparent from these data that the change was significant.

## **Play**

The mean score changes between the groups for Time 2 – Time 1 were: Group A,  $M = 2.33$ ,  $STD = .82$ , Group B,  $M = -.33$ ,  $SD = .82$ ,  $t = 5.66$ ,  $df = 10$ ,  $p < .001$ . The findings were clearly significant.

## **Change in Ability to Change**

The mean score changes for Time 2 – Time 1 for each group were: Group A,  $M = 2.50$ ,  $SD = .84$ , Group B,  $M = .17$ ,  $SD = 1.17$ ,  $t = 3.98$ ,  $df = 10$ ,  $p < .01$ . The change between group mean scores was clearly statistically significant.



## **Peer Interaction**

The statistical analysis revealed that change for Time 2 – Time 1 for the groups was: Group A,  $M = 2.83$ ,  $SD = 1.17$ , Group B,  $M = -.17$ ,  $SD = .98$ ,  $t = 4.81$ ,  $df = 10$ ,  $p < .01$ . The difference in scores between the two time points was clearly significant.

## **Listening Skills**

Time 2 – Time 1 change between each group was as follows: Group A,  $M = 3.33$ ,  $SD = .52$ , Group B,  $M = .50$ ,  $SD = .86$ ,  $t = 9.56$ ,  $df = 10$ ,  $p < .001$ . As with the preceding dependent variables the difference between Groups A and B was highly significant.

Table 5:9 on the next page summarises the change in the mean scores for Groups A and B for Time 2 – Time 1, for the 8 dependent variables; as can be seen, the information was compiled from data obtained from the independent-samples *t*-tests. The results are highly significant and provide evidence for the experimental manipulation.

**Table 5:9 Summary of Analyses of Change in Time 2 – Time 1 for the Dependent Variables for Groups A and B**

Dependent Variables	Mean Group A	Mean Group B	t-value	P-value
Verbal Expression	3.33	.50	7.06	< 0.001
Verbal Comprehension	2.50	-.17	9.22	< 0.001
N-Verb Comprehension	3.17	.17	3.53	.005
Eye Contact	2.67	-.50	6.64	< 0.001
Play	2.33	-.33	5.66	< 0.001
Ability to Change	2.50	.17	3.98	.003
Peer Interaction	2.83	-.17	4.81	< 0.001
Listening Skills	3.33	-.50	9.55	< 0.001

The null hypothesis for question one predicted that there would be no difference in the social, communication and thinking skills between the participants in Groups A and B: in other words, the social skill levels between the experimental and control group would remain unchanged regardless of treatment. This prediction, however, was not substantiated by the descriptive data in the previous section, which revealed clear gains in social skills for Group A over Group B.

From evidence gathered from the parametric analyses summarised in Table 5:9, it is clear that the differences between Groups A and B were statistically significant in all cases: as previously stated this provides evidence for the experimental effect ( $p < .01$ ). Based on these findings the null hypothesis for question one was rejected.

The reader is advised that Tables showing change between the dependent variables for Groups A and B not shown in the above text are located in Appendix five.

## **C 2. Null Hypothesis for Research Question Two**

*There will be no difference in the behaviour of the participants between baseline and the training phase. There will therefore be no generalised application or maintenance of social, communication and thinking skills.*

The null hypothesis for question two proposes that there will be no acquisition and effective use of social skills by the participants between baseline measures and the training phase. This outcome could reasonably be expected in the absence of an experimental effect: however, as shown above the group that received the treatment (Group A) did show change, whilst the control (Group B) showed only non-significant variance.

In order to investigate the second hypothesis, a more specific investigation was undertaken: this comprised the use of a dependent *t*-test on Group A (N = 6) in order to calculate change in mean scores between Time 1 and Time 2 for each dependent variable. The paired-samples (Time 1 and Time 2) group statistics (see Appendix five) reveal considerable differences between the two measuring points for all 8 dependent variables for the experimental group. Table 5:10 below presents the analysis of the results:



**Table 5:10 Dependent T-Tests Showing the Mean Difference Between Time 1 and Time 2 for the Dependent Variables for Group A**

Dependent Variables	Mean	Std. Deviation	Std. Error Mean	t-value	df	p-value (2-tailed)
Verbal Expression	3.33	.52	.21	15.81	5	<.001
Verbal Comprehension	2.50	.55	.22	11.18	5	<.001
N-Verb Comprehension	3.17	1.47	.60	5.27	5	<.01
Eye Contact	2.17	1.03	.42	6.33	5	<.01
Play	2.33	.82	.33	7.00	5	<.01
Ability to Change	2.50	.84	.34	7.32	5	<.01
Peer Interaction	2.83	1.17	.48	5.94	5	<.01
Listening Skills	3.33	.52	.21	15.81	5	<.01

The data presented in Table 5:10 represent the findings of repeated measures (Time 1 and Time 2) for the dependent variables for Group A. It is clear from the *p-values* that the difference between the paired-samples was highly significant; the difference between the mean changes and Std. Error Mean estimates (the former being much higher than the latter) shows that the change was not simply due to chance, but was attributable to the experimental manipulation (Field, 2005). From this it follows that Group A acquired better social skills as a result of training: on this basis the null hypothesis was rejected.

The above findings also address wider educational issues: for example, it was clear that the introduction of a SST programme within a mainstream school environment could improve the social skills of individuals with ASD without compromising the general notion of mainstream integration. Indeed, the

provision of the training programme not only improved the social skills of the treatment group, but enabled the participants to function more effectively within normal classroom settings: under these circumstances it was not unreasonable to assume that the post treatment conditions (normal classroom settings) served to assist in the generalisation and maintenance of the participants' newly acquired social skills where they could be practised and reinforced under optimal conditions (within a natural environment).

## **D. QUALITATIVE DATA**

### **D 1. Pre-study Assessment**

In the previous section, the emphasis was on using a quantitative approach to measure change in the dependent variables in response to the influence of the independent variable; this approach is typically experimental and its validity requires that important assumptions are met (which in this study was the case).

The second method used to analyse data in this study was qualitative in orientation: this method focuses on an individual's feelings, thoughts, perceptions and use of language (Baker, Pistrang and Elliott 2002) in order to understand a situation or event. These concepts do not lend themselves easily to numerical enquiries and instead observations, interviews or questionnaires are used in order to establish cause and effect.

In the present study the qualitative research aspect consisted of eleven questions in a prepared self-report schedule based on the work of Connor (2000). The schedule was administered to Groups A and B prior to the

intervention phase: it was done at this stage in order to avoid possible contamination by the experiences of the experimental group, which the control group did not share. At the end of the treatment phase of the study, Group B did subsequently receive the intervention, but only when it was clear that the outcome had been successful for group A: following this the self-report schedule was administered to both groups again.

The aim of the self-report schedule was to gain insight into the experiences of the participants as a way of highlighting strengths and weaknesses in school-based systems that may impact upon behaviour, communication and learning outcomes.

The participants' responses to the schedule were recorded verbatim by the Special Needs Co-ordinator (SENCO); however, only the core concerns raised were used in the subsequent analysis: the reason for this was that the participants tended to be long-winded in their explanations and often strayed off the point. As mentioned earlier, this aspect of the research was considered important, not just as a way of exploring the experiences of the participants, but as a way of identifying patterns and themes that would complement the quantitative aspects of the research process and yield a more complete explanation of how best to address the special needs of pupils with ASD.

In addition to the eleven questions used in the schedule, the current researcher also constructed a *response scale* in which there were four labels that were specifically designed to tease out the attitudes of the participants towards school: consideration was also given to making sure that the scale was discrete,





**Question 2: What kind of topics or activities are you good at?**

**Outcomes (Responses of Participants) Pre-Study**

<b>Topic / subject</b>	<b>References</b>	<b>Comments</b>
History	2	Just enjoy the subject
Mathematics	3	It is easy to get right (logical)
Science	4	Like doing experiments
ICT	1	Likes working on computer
PE	1	Likes football (no reason given)
English	1	Teacher is nice (did not expand)
DT	1	Likes cooking things
PSHE	1	Tutor is nice (no explanation of nice)

**Question 3: What do you most dislike about school and why?**

**Outcomes (Responses of Participants) Pre-Study**

<b>Topic / subject</b>	<b>References</b>	<b>Comments</b>
Being bullied	6	Reported but not elaborated upon
Dance	1	Perceived as a silly topic
Lessons Teacher X	2	Teacher shouts too much
Dinners	3	Do not get as many chips now
Everything	3	Unable to provide coherent explanations

***Question 4: What do you do if you are worried or have a problem at school?***

***Outcomes (Responses of Participants) Pre-Study***

<b>Topic / subject</b>	<b>References</b>	<b>Comments</b>
<b>Nothing</b>	<b>1</b>	<b>Did not have a strategy for seeking help</b>
<b>Try to ignore it</b>	<b>1</b>	<b>Walked away quickly or runaway</b>
<b>Did not talk</b>	<b>1</b>	<b>Run away quickly</b>
<b>Talk to my LSA</b>	<b>2</b>	<b>Discusses with Support Assistant</b>
<b>Go to Mrs T.P</b>	<b>1</b>	<b>Discusses with concerns with SENCO</b>
<b>Go to Miss S</b>	<b>2</b>	<b>Seeks advice from tutor</b>

***Question 5: What makes you most worried or scared at school?***

***Outcomes (Responses of Participants) Pre-Study***

<b>Topic / subject</b>	<b>References</b>	<b>Comments</b>
<b>Being bullied</b>	<b>9</b>	<b>Afraid of being bullied in school</b>
<b>Having no friends</b>	<b>1</b>	<b>Concerned about lack of friendships</b>
<b>Getting lost in school</b>	<b>1</b>	<b>Can not always find the class or location</b>
<b>Getting chased</b>	<b>1</b>	<b>Concerned about being hurt by others</b>



***Question 6: What do you do at break and lunch time?***

***Outcomes (Responses of Participants) Pre-Study***

<b>Topic / subject</b>	<b>References</b>	<b>Comments</b>
<b>Go outside school</b>	<b>7</b>	<b>To get away from others</b>
<b>Stayed in school</b>	<b>1</b>	<b>Talk to teachers in learning Pod</b>
<b>Games club</b>	<b>1</b>	<b>Play games (in Success Maker)</b>
<b>Success Maker</b>	<b>3</b>	<b>Learning on computers</b>

***Question 7: Which people do you like in school and why?***

***Outcomes (Responses of Participants) Pre-Study***

<b>Topic / subject</b>	<b>References</b>	<b>Comments</b>
<b>Nobody</b>	<b>3</b>	<b>Participants could not elaborate</b>
<b>Mrs T.P</b>	<b>4</b>	<b>Gives help and support</b>
<b>Tutors</b>	<b>3</b>	<b>Tutors provide encouragement</b>
<b>Miss J</b>	<b>1</b>	<b>Provides me with lots of help</b>
<b>Mrs W</b>	<b>1</b>	<b>She is nice and does not shout</b>

*Question 8: Which people do you not like in school and why?*

*Outcomes (Responses of Participants) Pre-Study*

<b>Topic / subject</b>	<b>References</b>	<b>Comments</b>
<b>Everyone</b>	<b>3</b>	<b>Don't know (could not elaborate)</b>
<b>Bullies</b>	<b>4</b>	<b>Fearful of being bullied</b>
<b>Teachers Shouting</b>	<b>5</b>	<b>Cannot stand teachers who shout</b>

*Question 9: What helps you to learn best?*

*Outcomes (Responses of Participants) Pre-Study*

<b>Topic / subject</b>	<b>References</b>	<b>Comments</b>
<b>Don't know</b>	<b>6</b>	<b>Participants could not comment</b>
<b>Not sure</b>	<b>5</b>	<b>Unsure about their needs</b>
<b>CSA help</b>	<b>1</b>	<b>Support was viewed as important</b>

**Question 10: When or what do you find hard to learn?**

**Outcomes (Responses of Participants) Pre-Study**

<b>Topic / subject</b>	<b>References</b>	<b>Comments</b>
Everything	2	Unable to give reasons
Lots of things	1	Could not say what things
Being bullied	1	Were unable to say why
Changing group	1	Did not understand why
French	1	It was considered too hard
Art	1	Too much noise in the classroom
Drama	1	Silly subject, hate it.
English	4	Too hard to do.

**Question 11: What things would you like to change in school and why?**

**Outcomes (Responses of Participants) Pre-Study**

<b>Topic / subject</b>	<b>References</b>	<b>Comments</b>
Get rid of bullies	11	Afraid of bullies around school
Chairs uncomfortable	1	Only likes comfortable grey chairs

Some participants found it difficult to explain their concerns succinctly and would often say “I don’t know” or “I can’t remember”: in general, however, when their fears were part of real experiences they appeared to have less trouble verbalising them. As previously stated, the participants tended to provide



rambling explanations and because of this only the core ideas were reported after being correlated. The *comments* column above contains the essential ideas and thoughts of the participants but not as in verbatim.

## **D 2. Summary of Pre-Assessment**

From the comments made by the participants, it was clear that there were a number of concerns raised that could be loosely categorised into three areas representing: fear provoking situations, preference for visually presented teaching material and dislike of noisy or crowded environments. The following points illustrate the areas of concern and preferences of the participants:

- A fear of being bullied around school (break and lunch-times)
- Anxiety about how to seek help and from whom
- Used escape strategies to avoid fearful situations
- Disliked teachers who raised their voices (probably to get attention)
- Dislike of lessons that required lots of written components
- Disliked crowded situations or large class sizes.
- Preferred lessons that had visual components (videos)
- Enjoyed lessons that were less language based and more practical
- Preferred teachers who presented as being calm.

It was recognised that collating the results from the views of individuals with serious communication disorders was not a straightforward process; for instance, individuals with ASD in general do not like noise and would feel very uncomfortable with teachers who raise their voices and this would equally apply

to other noisy environments such as dining areas. Furthermore, the intentions and motivations of people in general are difficult enough to understand for individuals who do not have communication problems: for those who do have ASD and experience significant problems even interpreting facial expressions is a very challenging situation indeed.

Given the difficulties outlined above, it was a deliberate policy by the current researcher not to take at “face value” the comments made by the participants, but to try to understand them within the condition of ASD; it was clearly important to accept that their concerns were legitimate and formed the basis for modifying the teaching environment.

The SENCO recognised many of the comments made by the participants in response to the self-report schedule and was able to “flesh out” some of their perceptions that made sense in terms of contextual factors; for example, being rigid with poor communication would result in a reluctance to seek help. Having a fear of bullies could account for a reluctance to use corridors and unsupervised areas; and a dislike of noisy classrooms and areas such as the dining area was consistent with the known auditory problems associated with ASD. The comments made by the SENCO were as follows:

- The participants displayed marked problems with social interaction
- Participants were rigid and reluctant or unwilling to try new things
- The participants were very disorganised and forgetful
- The participants were generally isolated and very anxious
- The participants were much more responsive in 1:1 situations

- The participants were all regarded as odd by other pupils
- All participants liked to avoid the dining room and corridors.

### **D 3. Outcome of the Self-Report Schedule**

It was clear that from the responses made by the participants that there were common concerns that were shared by all participants: the major one was given as the actual or possibility of being bullied. Although this was not considered a serious school-based problem, the possibility was nevertheless taken seriously by school-based staff and investigated.

The outcome of the above enquiry indicated that the reported incidents of bullying could in part be attributed to the poor understanding of the participants in relation to banter, meaning of eye contact, misunderstanding the intentions of others and accidental body contact in crowded areas. Nothing of a deliberate and persistent nature was discovered in respect of either physical or verbal bullying.

Given the perceptual problems associated with ASD, the pre-and post self-report schedule scores were not intended by the current researcher to yield numerical data that would be amenable to statistical analysis, but rather to reveal a shift in the attitudes of the participants that indicated improvements in the learning environment.

The pre-treatment scores for the 12 participants amounted to a total of 14. Ten participants rated school as 1 (I dislike school a lot) and two participants rated



school as 2 (I dislike school): from these responses it was clear that the perceptions of the 12 participants were extremely negative towards school.

#### **D 4. Implementation of Systems Change**

In response to the views expressed by the participants in the self-report schedule, school-based staff undertook a thorough and comprehensive review of the teaching and support systems in place for pupils with ASD at the time. A programme of further school-based training was planned by the SENCO for some teachers and support staff; a decision was made to review the whole school approach to teaching individuals with ASD and implement permanent changes, but only after both groups had received the treatment phase. The following changes were agreed:

- There would be an emphasis on teaching strategies that used visual aids
- All participants would spent their lunch breaks with support staff
- All participants would be allowed to spend breaks with support staff
- The most vulnerable participants would be escorted between lessons
- Staff would be informed of the auditory problems associated with ASD
- Participants would be allocated a named staff member to meet with daily.

#### **D 5. Effect of Change**

As stated above the self-report schedule was administered for a second time post training to both groups: on this occasion the schedule revealed a total score of 39; the breakdown of scores showed that nine participants rated school

as 3 (I quite like school) with three giving a rating of 4 (I like school a lot). This was an obvious improvement between pre and post treatment ratings (from 14 to 39), with the most common factors associated with the change as being:

- Liked lessons in which visual aids were used (television and video)
- Liked working with computers (two lessons each week)
- Liked having lunch with Special Needs teaching staff
- Liked spending break-times in Special Needs room
- Liked using lesson folders to organise work
- Liked the visual timetable
- Liked being away from crowded areas and noisy places.

The above pattern of change was essentially organisational in nature and did not distract from the normal mainstream school curriculum delivery: rather it enhanced lessons by improving the satisfaction of the participants in relation to school generally, and ensured more consistency in respect of attendance in normal lessons.

#### **D 6. What Comprised a Typical School Day?**

The changes referred to above were carefully planned with the clear aim of providing a more interesting and effective learning environment that provided security and enhanced the opportunities for effective communication.

In a typical day, each participant met with his or her Support Assistant and reviewed the visual timetable and the lessons to be covered. The Support

Assistant discussed the work that had been done in the previous lesson and planned for the current session; when the participant was satisfied and confident that he or she could proceed, the work folder was issued and returned at the end of the lesson. This procedure was repeated for all lessons for that day; the process was facilitated by the fact that the Support Assistant helped in most lessons and could therefore continue a dialogue with the participant (organise learning in a quiet and calm manner). The attention to linking topic information in a sequential fashion appealed to the cognitive processes of the participants.

As stated above, there was a deliberate strategy in place to use more sensory aids, such as, film, video and tape recordings to impart information rather than rely solely on the traditional "chalk and talk" approach; participants could also expect shorter written assignments with the priority of comprehension of task content rather than quantity. The amount of computer based learning was also a feature of the change in emphasis to learning strategies.

With Support Assistants attending most lessons and monitoring assignments, participants could expect to be escorted between lessons (if happy with the arrangement) which helped to reduce levels of anxiety in the participants; in addition, the increased time spent with staff at lunch and break-times was welcomed by the participants.



## **CHAPTER SIX: DISCUSSION**

### **A. OVERVIEW OF DISCUSSION**

In the present chapter the findings of this study are discussed in relation to the literature review presented earlier: these include the core features of ASD, and the theoretical models used to account for the symptoms. These individual components are linked in order to provide a rationale for the various interventions used to reduce symptoms and improve learning in those with the disorder.

In addition to the above, the aims of the study are reviewed together with the implications of the findings for future teaching practice and research; the hypotheses are re-visited and the strengths and limitations of the current study are considered. The research design is reviewed and suggestions are made as to where the emphasis should be placed on future research and intervention programmes for individuals with ASD.

The above concepts underpin the single most important aim of this thesis, which has been to examine the effect of providing a comprehensive social skills training programme to improve the social functioning of individuals with ASD within a mainstream environment: with this in mind the emphasis in this Chapter is on discussing the findings from the current study within the following sections:

- (i) Aims and Hypotheses Re-visited**
- (ii) Theoretical and Applied Significance of the Current Findings**

- (iii) Strengths and Weaknesses of the Current Study
- (iv) Directions for Future Research

## **B. AIMS AND HYPOTHESES RE-VISITED**

### **B 1. Null Hypothesis for Research Question One**

*There will be no difference in the social, communication and thinking skills between participants in the intervention versus the non-intervention conditions.*

In essence the null hypothesis for research question one predicted the social and communication skills between the groups would remain unchanged from baseline levels: this amounted to a declaration that the social skills training programme would be ineffective in developing the social and communication skills of the participants in the treatment group as compared with the control. Had this been the case, the research aims would not have been fulfilled: however, from the evidence presented earlier in the form of Figures 5:1 to 5:8 it was clear that an obvious divergence had occurred between the group means for each of the dependent variables. The changes are shown in Table 5:9.

The above findings are consistent with research quoted in Chapter Two: for instance, Smith and Fluck (2000) conducted a study in which they compared the traditional approach to fostering social and communication skills, such as, focusing on the production and comprehension of language (as used in language therapy): this linguistic approach was compared (using a two-group design) with a strategy that encouraged social interaction through the use of

games that were graded in terms of complexity, whilst remaining consistent with the participants' levels of development.

The results of the Smith and Fluck study showed that the experimental group (individuals with communication difficulties) showed significant improvements in their levels of social skills compared with the control group (who received traditional language therapy): the overall conclusion of the study was that social and communication skills can be developed more effectively within an appropriate learning environment in which interpersonal exchanges can occur rather than just focusing on language exchanges.

The study referred to was consistent with the current researcher's aim of fostering the development of communication skills within an appropriate learning environment that was contextually based and appropriate to the tasks and assignments being focused on: this had the added advantage of ensuring that language, tasks and activities were matched to aid comprehension.

## **B 2. Null Hypothesis for Research Question Two**

*There will be no difference in the behaviour of the participants between baseline and the training phase. There will therefore be no generalised application or maintenance of social, communication and thinking skills.*

As well as ensuring the effectiveness of the intervention programme, it was also important to establish that the social skills that were taught in the training phase would not just be expressed or applicable to that specific situation: indeed, a



major aim of this research was to show that the learned skills could be generalised to other situations. The results shown in Table 5:10 revealed that not only were the mean score differences between Groups A and B significant ( $p < 0.01$ ), but that the difference in mean scores between Time 1 and Time 2 for Group A (treatment group) were also statistically significant (see Table 5:10).

It was concluded from the findings of the data analysis that there was ample evidence to support the notion that there were clear statistical differences between Groups A and B in terms of social skills acquisition: moreover that the difference in mean scores extended to Group A between the two measuring points (Time 1 and Time 2). This meant that the experimental manipulation had been effective: on this basis it was considered safe to reject the null hypotheses for questions one and two.

The generalisation of the taught social skills was discussed in Chapter two and it was pointed out that a pre-requisite for this to occur was that training programmes had to provide opportunities for trainees to practise the skills in a range of settings (Goldstein, Glick and Gibbs, 1998); this has the additional advantage of allowing what Gresham (1998) refers to as “naturally occurring reinforcers”, such as, praise, attention, positive feedback and credibility. In other words, for taught behaviours (social skills) to be maintained they have to be practised in order to be reinforced in a range of settings.

The current researcher was mindful of the need to ensure that the conditions necessary for maximum learning to occur were in place: for instance, that there were regular reviews of the objectives within the social skills training

programme and that monitoring of the environments used for teaching and training were in place. These factors were judged to be conducive to learning.

From the above, it was clear that the small group situation (intensive training phase) for Group A, N = 6, had proved to be an effective environment in which to both deliver and acquire the social skills intended by SST: moreover, the post-training levels of social skills remained high within normal classroom settings for the experimental group. Table 5:10 shows the results of parametric testing (Time 2 – Time 1) for the dependent variables; as can be seen the mean difference was  $p < 0.01$ .

The current researcher also considered an important factor in the above, was the enriched teaching environment offered by having “normal peer groups” that also provided greater opportunities for the participants to imitate and practise learned social skills; from this it was clear that small group SST was highly effective, but used alongside normal classroom settings was a powerful combination that ensured that newly acquired social skills generalised.

The above findings are consistent with the study discussed in Chapter two that was undertaken by Koegel, Koegel and Fredeen (2001), in which the researchers compared 5 children diagnosed as having ASD with typically developing peers within a normal classroom setting: it was found that the ASD group rarely engaged in social interaction with other children; however, when the two groups of children were placed in a social skills training programme together and given the opportunity to practise newly learned social skills, the

individuals with ASD were much more willing to socially interact with the non-autistic group.

The above study was important in relation to the present study for several reasons: firstly it demonstrated that social interactional skills could be developed in individuals with ASD through the use of an appropriate training programme; secondly, it showed that typically developing children could effectively interact with individuals with ASD within a mainstream learning environment; thirdly it raised the distinct possibility that non-autistic individuals taught alongside pupils with ASD would act as “social models” and reinforce interactional skills within the mixed groups. The viability of mixed teaching and inclusion was an aim inherent of the research project: the findings of the above support the notion that a training phase followed by normal teaching situations is compatible and indeed desirable.

## **C. THEORETICAL AND APPLIED SIGNIFICANCE OF THE CURRENT FINDINGS**

### **C 1. Theoretical Significance**

The uniqueness of this study lies in the establishment of a comprehensive social skills training programme (SST) within a secondary mainstream school that sought to examine the effect of training on a group of teenage pupils diagnosed with ASD. This has long been a goal of researchers, but to the best knowledge of the present researcher has not hitherto been fully achieved: the SST package delivered was detailed and contained essential teaching targets that if acquired by the participants would cover many of the skills that could



facilitate interactions between the participants and their typically developing peers.

Of particular theoretical interest was the notion that a “normal setting” was the most appropriate environment in which to conduct a study of this nature; the overriding reason for this was that the current researcher strongly believed that for social learning to occur effectively, it had to occur within an environment where levels of eye contact, imitation, cooperation, turn-taking, play, language and exchanges of ideas were “normal” and were also contextual. In other words, language, actions and activities were thematically matched to the learning environment.

A further theoretical area of interest was the idea that small group training using a SST programme would prove to be the *trigger* that allowed the newly learned social skills to be maintained and used within normal classroom situations: in the absence of this arrangement, it was thought likely that individuals with ASD would be overwhelmed by high levels of eye contact, language and complex ideas, having not been previously prepared for the planned acquisition of these skills through structured exposure and a significant number of practice sessions.

## **C 2. Applied significance**

The current study provided an applied theoretical framework by which Local Educational Authorities could admit pupils with ASD into mainstream schools, where they would be exposed to normal levels of social communication as

expressed by typically developing pupils; inclusion is a well accepted educational principle and is a goal that most LEAs would seek to achieve for all pupils except the most extreme cases.

From the current research findings the proviso would be the adoption of a SST programme by mainstream schools who admit pupils with ASD: the literature search discussed in Chapter two shows that pupils engaged in the SST programmes do not necessarily have to have ASD; it is perfectly acceptable to have mixed groups that may contain some pupils with ASD, others who are shy, some with learning difficulties or even those with low self-esteem.

The findings of the research also have financial implications for LEAs as well as educational ones: the fact is that it is expensive to educate pupils with ASD in specialist schools, which are arguably less effective because normal classroom settings are not available and neither are typically developing children. Furthermore, it is unlikely that any learned social skills will generalise to settings outside the specialised placement in which they are taught.

As well as the above, an extremely important factor often lacking in the lives of children who are taught in specialised school is the close family contact that is lost for large parts of the year: this means that parents cannot engage in planned approaches to treatment. On the other hand, a locally operated SST programme can specifically encourage joint involvement with parents who can take part in planned practice sessions. There is also the added advantage that continuity and consistency is maintained with the individual's local community.

### **C 3. Strengths**

A major strength of this study was that it was primarily based upon theoretical models of learning, development and cognitive models of ASD; these had in themselves been shown to be robust in the face of empirical scrutiny. Credit must go to those theorists that laid down the foundations that helped make this research possible, the current researcher was fortunate to have recognised that the social skills of individuals with ASD need much more than the currently available narrow based approaches employed: in other words, in the present study the learning environment had to be naturalistic (not clinic based) and contain good social models, as well as a substantial social skills training programme with ample opportunities to foster and practise important social skills, such as:

- Talking about oneself
- How to approach others
- How to make friends
- How to join-in activities with others
- How to plan and complete assignments
- How to recognise the moods and feelings of others

The above was facilitated by the structured teaching environment that was used to deliver the SST programme and the application of combined visual and task orientated techniques (framed within fun situations).



A second major strength of this study was that for the first time a significant project based on a SST programme had been undertaken within a secondary mainstream school. In view of this, the aim was admittedly ambitious, but extremely worthwhile and the current researcher owes much to the dedicated school-based staff who agreed to engage in what was a reasonably long and time consuming study.

A third strength of the study was the use of appropriate dependent variables: these had previously been identified in the psychological literature (Connor, 2003) and were regarded as crucial for the development of social and communication skills (Connor, 2003): furthermore, they were highly compatible with the training programme and the various games and tasks that formed the training package.

A fourth, and obvious strength, was the findings of the study that revealed that a statistically significant change occurred between Groups A and B that was directly attributable to the treatment or intervention: this provided confirmation that overall the aims and objectives of the research had been met. For instance, it was shown that not only was it possible, but highly desirable to expose individuals with ASD to mainstream school environments. The adaptation by school-based staff to modify ways of working in order to meet the needs of individuals with ASD was regarded as positive: it was also commented on by staff that the behaviour and confidence of the participants had improved.

## **C 4. Weaknesses**

A major weakness in the study related to the small sample; this inevitably meant that not only was the scoring range limited, but important parametric assumptions were difficult to meet. In addition individuals with ASD are heterogeneous and there was a distinct possibility that the findings were due to a combination of uncontrolled errors and the personal quirks of the participants producing a misleading negative outcome (Type II error): these concerns were to some extent negated by the statistical outcomes which revealed large effect sizes.

A second limitation of the study that also related to sample size revolved around the question of applicability of the findings: that is, would they reliably generalise to other individuals with ASD exposed to the same conditions? On this point, the current researcher can state that following the success of the experimental group, the control (Group B) subsequently received the same social skills training programme with equal success to that of Group A.

A third weakness of the study related to its design, which was a straightforward comparative approach: although using an experimental and a control group was considered adequate by the current researcher, a four phase cross-over design would have been better and opened-up the possibility of using both within and between subjects to determine the experimental effects for both groups under almost identical conditions. In the absence of a more robust design, the current researcher attempted to guard against error by using a six week baseline period

and ensuring stability of measures by using only week 6 as Time 1; this was followed by running a 19 week treatment / extended baseline condition.

A fourth weakness of the present study was the way in which the repeated measures were obtained: the recording of data relied on a number of factors. For instance, the observational skills of the raters, the accuracy and precision of the recording instruments themselves: if the observations of the raters had been inaccurate, this would have biased measures obtained; likewise problems of inaccuracy and precision in the recording instruments would also have biased the recordings.

The present researcher considered that the high levels of correlations between the pairs of raters in their performances provided evidence for accuracy of their recordings: the second potential threat of instrumental failing was countered on the basis that no discrepancies were detected in the mean scores made by the instruments or high standard deviations. The current researcher concluded that no threat to the study existed on the basis of faulty recordings by either raters or malfunctioning equipment.

#### **D. DIRECTIONS FOR FUTURE RESEARCH**

The current researcher was naturally pleased with the outcome of this study, and content in the knowledge that the aims and objectives had been broadly achieved: this general feeling of satisfaction was also shared by the host school, who regarded the project as highly beneficial to the participants, a view also shared by parents.



Although the present researcher was confident that the outcome of this study was based on genuine improvements in the social skills of the participants: as previously stated, the sample size was small and given the heterogeneous nature of ASD, caution had to be exercised in terms of assuming that the findings would be applicable to other individuals with ASD.

In order to determine the above, an obvious solution would be to try to replicate the findings of the current study in a future project; for the foreseeable future, however, it is unlikely that secondary mainstream schools will have sufficient numbers of individuals with ASD on roll to justify a further study using small samples. In order to increase participant numbers, an alternative approach might involve the use of two or more schools, one acting as the experimental school (group) and the other the comparison school (control group): in this way a two-group cross-over design could be used in which the participants act as their own controls in both conditions (Robson, 1995).

A future research project might be based on the use of a dedicated team to train schools to use the SST programme prior to the start a larger study. The training need not be restricted to secondary schools and could include the primary sector as well as having mixed groups; that is, most with ASD but others who have poor social skills.

On reflection, it is difficult to be precise when trying to determine which particular factor or variables were the most important in the success of a complex study, but good planning and a readiness to be flexible were

considered to be crucial in the completion of this particular study. The choice of a social skills training programme as the focus of the research was of course central to the project, although to some extent this raised further questions: for instance, it was not entirely clear as to which particular aspects of the programme were principally responsible for the development of the social skills. The programme comprised: games, role play, activities, question and answer sessions, all of which were designed to encourage higher levels of social communication between the participants: it is likely that these are all fundamental elements in the process of communication.

Although overall the above programme was effective, more research needs to be undertaken in order to establish precisely which particular aspects of the training produced the desired effect. A better understanding of this could inform researchers of more developmentally appropriate time-frames in which to deliver SST. In other words, are early interventions more likely to *"trigger"* neuronal mechanisms to develop the attributes necessary for normal social interaction?

## **CHAPTER SEVEN: CONCLUSION**

The current researcher set out to examine whether or not it was possible to improve the thinking, social and communication skills of individuals with ASD, by using a comprehensive social skills training programme; it was argued that these were essential attributes that enable individuals to share ideas, feelings and desires that allowed people to function in complex and social ways that defined our unique human qualities.

Without the abilities referred to above, it would be extremely difficult for any individual to enjoy a satisfying life experience: indeed, the likelihood is that anxiety, frustration and even depression may become a prominent feature for considerable periods of time: sadly these could be so marked as to prevent many individuals with ASD leading independent lives.

Whilst the above emotional difficulties associated with ASD cannot be eradicated at the present time, effective interventions may at least help individuals with ASD to function more effectively and develop supportive relationships.

This study has shown that social skills training can be provided by mainstream schools, using their existing facilities with virtually no drawbacks or increase in costs. In fact, this study was able to show that benefits include: reduction in absenteeism amongst individuals with ASD, improved behaviour, increases in their self-esteem, a better appreciation of school and improved examination results.



The overall aims of the study were achieved, and it was demonstrated that social skills training can be effective if delivered within a structured teaching environment using small groups: thereafter it was shown that the structure was no longer required to enable the participants to continue to benefit from normal classroom settings.

The qualitative aspect of the research revealed several areas of concern that were relatively easy to address without the need for extra resources: this involved organising work systems into more effective programmes, providing more support in areas of the school where the participants were vulnerable, and providing alternative situations for break-times and lunch-breaks.

Almost two years after the study was completed, staff remained highly satisfied with the outcomes and all participants were reported to have made impressive gains in both learning and communication. Two of the more able participants progressed to higher education.

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## APPENDICES

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## **APPENDIX ONE**

- 1. ETHICAL CONSIDERATIONS**
- 2. LETTER TO PARENTS**
- 3. CONSENT FORM**
- 4. LOCAL AUTHORITY CONSENT**

## **ETHICAL CONSIDERATIONS**

Approval of the current study was obtained from Hull City Council's Ethical Committee under the guidance of the Principal Educational Psychologist. This was in accordance with the British Psychological Society's (BPS) Code of Conduct, Ethical Principles & Guidelines (1996), research procedures with children require special safe-guarding due to the fact that children are by definition developmentally immature. The first consideration was to ensure the well-being of each individual in the study by adhering to the guidelines AS outlined by the BPS in the construction of the study.

With respect to issues of consent the parents teachers of each potential participant was required to give consent to take part in the study before any pupil was approached: however, in accord with BPS guidelines each pupil retained the right to withdraw his or her consent irrespective of the views of other acting on his or her behalf. With this fundamental choice in place, no pupils or parents exercised their right to withdraw from the study. For the participants in the study, the utmost care was taken to ensure that the testing and teaching environments were pleasant and that the participants were not exposed to time periods (for testing or teaching) that they could not tolerate.

It was also ensured that in keeping with Section 8.4 on page 10 of the BPS guidelines, results and the performances of individuals were treated with confidentiality and anonymity: furthermore, great care was taken to ensure that feedback of results given to adults involved in the study was done in a way that did not influence their attitudes towards those who took part in the study.



## **Dear Parent or Guardian**

I understand that you have expressed a wish to have your son / daughter entered into the Social Skills Training Programme that is due to commence in May 2003.

I know that the SENCO has given you and your son / daughter detailed information about the study and what we hope to achieve on behalf of your daughter / son as a result of the training offered. However, you may still wish to discuss the study with me and if this is the case I have provisionally booked a 45 minutes session for you and your son / daughter on the \_\_\_\_\_ at \_\_\_\_\_.

If the above time or date is not convenient for you, please telephone the SENCO who arrange for you to see me on one of my visits. Throughout the period of the study I will be in the school every fortnight; if you have any concerns about the project and would like a chat to me, please do not hesitate to contact either me or the SENCO.

If you would prefer me to visit your home and discuss the study, please let me or the SENCO know and we can arrange a mutually convenient time. However, be assured that all parents and guardians will be informed of the outcome of the project and this will provide opportunities to discuss the implications of the work.

**K.G.Plumb, Educational Psychologist**





Hull

Learning and Culture

**CITY PSYCHOLOGICAL SERVICE**

Your Ref:

My Ref: AJMm/Plumb Ken

Contact: Mr B Levey

Tel: 01482 613390

Fax: 01482 613359

Email: Alison.Moore@hullcc.gov.uk

Date: 18<sup>th</sup> August 2004

Mr K Plumb  
27 West Mill Rise  
Walkington  
HULL  
HU17 8TP

Dear Ken

**RE: ASD RESEARCH PROPOSAL**

I have reviewed your proposal and my opinion is that this is a worthwhile research project which should benefit a wide audience of secondary schools. I have no reservations about approving it on both academic and ethical grounds.

Yours sincerely

PP BERNARD LEVEY  
Principal Educational Psychologist

Essex House, Manor Street,  
Kingston upon Hull, HU1 1YD  
Textphone: 01482 613041

[www.hullcc.gov.uk](http://www.hullcc.gov.uk)



**Kingston upon Hull City Council**



## **APPENDIX TWO**

- 1. DSM-111 / DSM-111-R / DSM-1V CRITERIA**
- 2. ICD-10 CRITERIA**
- 3. DISCO**

## Diagnostic and Statistical Manual of Mental Disorders (DSM)

	DSM-111 (1980)	DSM-111-R (1987)	DSM-IV (1994)
<b>Name of Disorder</b>	Infantile autism	Autistic disorder	Autistic disorder
<b>Onset</b>	Before 30 months	During infancy or Childhood	Onset before 3 years of delayed or abnormal function in at least one of: social interaction language for social communication, symbolic play or imaginative play
<b>Social Behaviour</b>	Pervasive lack of response to other people	Qualitative impairment in social interaction (5 mutually exclusive criteria)	Qualitative impairment in social interaction (at least 2 of 4 criteria)
<b>Language and Communication</b>	Gross deficits in language development. Speech, if present, has peculiar patterns	Qualitative impairment in verbal and non-verbal communication and imaginative activity	Qualitative impairments in communication (at least 1 of 4 possible criteria)
<b>Activities and Interests</b>	Bizarre response to various aspects of the environment	Markedly restricted repertoire of activities and interests	Restricted repetitive and stereotyped patterns of behaviour, interests and activities (at least 1 of 4 possible criteria)
<b>Exclusion criteria</b>	Absence of delusions, hallucinations, loosening of association and incoherence as in schizophrenia	None stated	Rett's disorder; Childhood disintegrative disorder; Asperger's syndrome

**Diagnostic criteria of Asperger's Syndrome from ICD-10 (World Health Organisation, 1993)**

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A. There is no clinically significant general delay in spoken or receptive language or cognitive development. Diagnosis requires that single words should have developed by 2 years-of-age or earlier and that communicative phrases be used by 3 years-of-age or earlier. Self-help skills, adaptive behaviour and curiosity about the environment during the first 3 years should be at a level consistent with normal intellectual development. However, motor milestones may be somewhat delayed and motor clumsiness is usual (although not a necessary diagnostic feature). Isolated special skills, often related to abnormal preoccupations, are common, but are not required for a diagnosis.

B. Qualitative abnormalities in reciprocal social interactions are manifest in at least two of the following areas:

(a) failure to adequately use eye-to-eye gaze, facial expression, body posture, and gesture to regulate social interaction.

(b) failure to develop (in a manner appropriate to mental age and despite ample opportunities) peer relationships that involve a mutual sharing of interests, activities and emotions.



**(c) lack of socio-emotional reciprocity to others as shown by an impairment or deviant response to other people's emotions or lack of modulation of behaviour according to social context or a weak integration of social, emotional and communicative behaviours.**

**(d) lack of spontaneous seeking to share enjoyment, interests, or achieve with other people (e.g. lack of showing, bringing, or pointing out to others objects of interest to the individual).**

**C The individual exhibits an unusually intense or circumscribed interest or restricted, repetitive and stereotyped patterns of behaviour, interests, and activities manifest in at least one of the following areas:**

**(a) an encompassing preoccupation with stereotyped and restricted patterns of interest that are abnormal in content or focus: or one or more interests that are abnormal in their intensity and circumscribed nature though not in the content or focus.**

**(b) apparently compulsive adherence to specific non-functional routines or rituals.**

**(c) Stereotyped and repetitive motor mannerisms that involve either hand / finger flapping or twisting, or complex whole body movements.**

(d) preoccupations with part-objects or non-functional elements of play materials (such as their colour, the feel of their surface, or noise / vibration that they generate).

However, it would be less usual for these to include either motor mannerisms or preoccupations with part-objects or non-functional elements of play materials.

D The disorder is not attributable to the other varieties of pervasive developmental disorder: simple schizophrenia, schizo-typal disorder, obsessive-compulsive disorder, anankastic personality disorder, reactive and disinhibited attachment disorders of childhood.

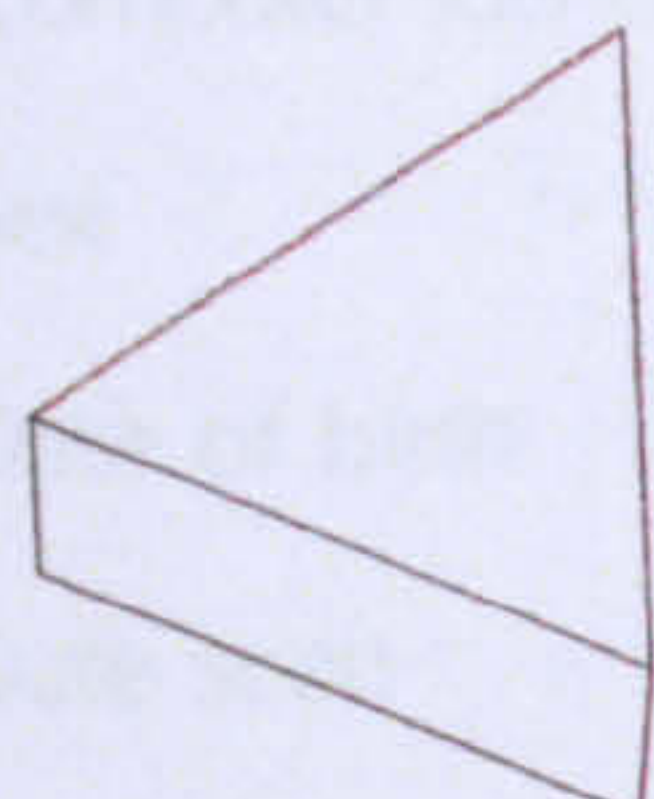
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DIAGNOSTIC INTERVIEW FOR SOCIAL AND COMMUNICATION DISORDERS

INDIVIDUAL REPORT

*Instructions for data entry*



NAME	<input type="text"/>
DATE OF BIRTH	<input type="text"/>
DATE SEEN	<input type="text"/>
INTERVIEW WITH (NAME)	<input type="text"/>
RELATIONSHIP TO CLIENT	<input type="text"/>
CLINIC NUMBER	<input type="text"/>
COMPUTER NUMBER	<input type="text"/>

ADDITIONAL INFORMATION



# DISCO

## Instructions for entering codes on computer

### PART 1 IDENTIFYING DATA

1. Computer Identifying number  IDNO
2. Sex  SEX
3. Date of birth  DOB
4. Date seen  DOA
5. Age when seen (months)  CA

### PART 2 INFANCY (first 2 years)

#### Section i. Medical

1. Evidence of foetal abnormality  FOETAL
2. Microcephaly  MICRO

#### Section ii. Behaviour

1. Perinatal condition  BTCON
2. Feeding – poor sucking  SUCK
3. Vomiting  VOMIT
4. Excessive crying/screaming  XCRY
5. Woke up screaming  WAKECRY
6. Reasons for crying  REASCRY
7. Sleep pattern  SLEEPAT
8. Unusually good/quiet/passive  UQUIET
9. Demand for social attention  SOCATTEN
10. Response to cuddling  CUDRESP
11. Eye contact (e.g. when feeding)  EYEFEEED
12. Responsive smile  RESSMILE
13. Making ready to be picked up  LIFTR
14. Reciprocation in baby games  GAMEREP
15. Waving bye-bye  BYEBYE
16. Babbling  BABBLE
17. Pre-speech 'conversation'  PROTOCON
18. Intoned pre-speech sounds  INTONINF
19. Response to speech  SPEECHNR
20. Interest in environment  ENVIRINT
21. Sharing of interests (Joint referencing)  JOINTREF
22. Looked when others pointed  POINTREG
23. Special interests  SPECINT

- 24. Attachment to one parent  ATTACH
- 25. Dislike of care procedures  CAREDIS
- 26. Oversensitive to noise  NOISESEN
- 27. Odd movements  ODDMV
- 28. Other problems  INFOTH

**PART 3 DEVELOPMENTAL SKILLS**

**Section i. Age of recognition of problems**

- 1. Age of A when parent first worried    ONSETP
- 2. Setback in development of skills
  - a Motor development    LOSSMOT
  - b Toilet training    LOSSTOIL
  - c Other self care    LOSSCARE
  - d Language    LOSSLANG
  - e Play    LOSSPLAY
  - f Social    LOSSOC
  - g Feeding    LOSSEAT
  - h Other adaptive skills    LOSSADPT
  - i Interest and curiosity    LOSSINT
  - j Head growth    LOSSHEAD
  - k Other    LOSSOTH
- 3. Onset of untypical behaviour    ONDISTUR
- 4. Was there a setback after 24 months?  DEVPRIOR
- 5. Skills lost or not used  SKILOSS

**Section ii. Gross motor skills**

**A. CURRENT LEVEL**

- 1. Walking on level surfaces   AWALK
- 2. Walking up and down stairs  AWALKUD
- 3. Riding a bicycle  ABIKE

**B. DEVELOPMENTAL STAGES**

- 1. Independent sitting    BSIT
- 2. Walking    BWALK
- 3. Riding tricycle    BTRIKE
- 4. Riding bicycle    BBIKE

**NB For every Section C throughout the schedule**

**Coding**

E = Behaviour ever present (code for worst manifestation)

C = Behaviour currently present

**Data entry on computer**

Example E  C  CCLIMB1/2

Enter 0 for CCLIMB1

2 for CCLIMB2

**C. UNTYPICAL BEHAVIOUR**

- |                                       |                            |                            |                   |
|---------------------------------------|----------------------------|----------------------------|-------------------|
| 1. Climbing                           | E <input type="checkbox"/> | C <input type="checkbox"/> | CCLIMB1/2         |
| 2. Clumsiness                         | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CCLUMSY1/2</u> |
| 3. Immature gait when walking         | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CGAIT1/2</u>   |
| 4. Poor co-ordination in PE and games | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CCOORD1/2</u>  |
| 5. Other                              | E <input type="checkbox"/> | C <input type="checkbox"/> | CMOTOTH1/2        |

**Section iii. Self care – toilet training**

**A. CURRENT LEVEL**

- |                                       |                          |          |
|---------------------------------------|--------------------------|----------|
| 1. Incontinence during day            | <input type="checkbox"/> | ACONTDAY |
| 2. Incontinence during the night      | <input type="checkbox"/> | ACONTNGT |
| 3. Cleaning and dressing after toilet | <input type="checkbox"/> | ATOILET  |

**B. DEVELOPMENTAL STAGES**

- |                           |                          |                          |                          |                |
|---------------------------|--------------------------|--------------------------|--------------------------|----------------|
| 1. Clean and dry in day   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <u>BDRYDAY</u> |
| 2. Clean and dry at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <u>BDRYNGT</u> |

**C. UNTYPICAL BEHAVIOUR**

- |  |                            |                            |            |
|--|----------------------------|----------------------------|------------|
| 1. Resistance to using pot or lavatory | E <input type="checkbox"/> | C <input type="checkbox"/> | CTOILRE1/2 |
| 2. Smearing                            | E <input type="checkbox"/> | C <input type="checkbox"/> | CSMEAR1/2  |
| 3. Constipation                        | E <input type="checkbox"/> | C <input type="checkbox"/> | CRETENT1/2 |
| 4. Diarrhoea or frequent stools        | E <input type="checkbox"/> | C <input type="checkbox"/> | CDIAR1/2   |
| 5. Other                               | E <input type="checkbox"/> | C <input type="checkbox"/> | CTOILOT1/2 |

**Section iv. Self care – Feeding**

**A. CURRENT LEVEL**

- |             |                          |        |
|-------------|--------------------------|--------|
| 1. Feeding  | <input type="checkbox"/> | AFEED  |
| 2. Drinking | <input type="checkbox"/> | ADRINK |

**B. DEVELOPMENTAL STAGES**

- |                                     |                          |                 |
|-------------------------------------|--------------------------|-----------------|
| 1. Eating solid food                | <input type="checkbox"/> | BSOLIDS         |
| 2. Giving up bottle or breast       | <input type="checkbox"/> | BBOTTLE         |
| 3. Feeding self with spoon and fork | <input type="checkbox"/> | <u>BEATSELE</u> |
| 4. Using knife and fork             | <input type="checkbox"/> | BKNFORK         |

**C. UNTYPICAL BEHAVIOUR**

- |   |                            |                            |            |
|---|----------------------------|----------------------------|------------|
| 1. Refuses food that is lumpy or hard to chew | E <input type="checkbox"/> | C <input type="checkbox"/> | CLUMP1/2   |
| 2. No interest in food                        | E <input type="checkbox"/> | C <input type="checkbox"/> | COFFOOD1/2 |
| 3. Excessive drinking of fluid                | E <input type="checkbox"/> | C <input type="checkbox"/> | CPOLYDI1/2 |
| 4. Refuses to feed self                       | E <input type="checkbox"/> | C <input type="checkbox"/> | CREFEED1/2 |
| 5. Other                                      | E <input type="checkbox"/> | C <input type="checkbox"/> | CEATOTH1/2 |



**Section v. Self care – Dressing**

**A. CURRENT LEVEL**

- 1. Dressing  ADRESS
- 2. Buttons  ABUTTON
- 3. Tying laces  ALACES

**B. DEVELOPMENTAL STAGES**

- 1. Pulling pants down and up  BPANTS
- 2. Independent dressing, not buttons  BDRESIND
- 3. Tying laces  BLACES

**C. UNTYPICAL BEHAVIOUR**

- 1. Willingness to dress self E  C  CDRSELF1/2
- 2. Slowness E  C  CDRSLOW1/2
- 3. Awareness of suitability of clothing E  C  CDRSENS1/2
- 4. Other E  C  CDROTH1/2

**Section vi. Self care – Hygiene**

**A. CURRENT LEVEL**

- 1. Washing  AWASH

**B. DEVELOPMENTAL STAGES**

- 1. Dries hands without help  BHANDS
- 2. Bathing and drying without physical help  BBATHE

**C. UNTYPICAL BEHAVIOUR**

- 1. Dislikes being washed etc. E  C  CWSHRE1/2
- 2. Willingness to wash etc E  C  CWSHWIL1/2
- 3. Awareness of need for cleanliness E  C  CWSHREQ1/2
- 4. Dislikes having dirty hands E  C  CWSHST11/2
- 5. Problems with menstruation E  C  CMENSTR1/2
- 6. Other E  C  CWSHOTH1/2

**Section vii. Domestic skills**

**A. CURRENT LEVEL**

- 1. Tidying, cleaning  ATIDY
- 2. Cookery, woodwork etc  ACOOK

**B. DEVELOPMENTAL STAGES**

- 1. Fetching, carrying, taking simple messages  BFETCH
- 2. Completing a simple task without supervision  BTASKAL

**C. UNTYPICAL BEHAVIOUR**

- 1. Willingness to help E  C  CHELP1/2

**Section viii. Independence**

**A. CURRENT LEVEL**

- 1. Avoidance of danger  ADANGER
- 2. Independence in and outside home  AINDEP
- 3. Staying at home alone  AHOMEAL

**B. DEVELOPMENTAL STAGES**

- 1. Going in garden alone  BGARDEN
- 2. Going to local shop on own  BSHOPS
- 3. Could be left alone at home for half day  BHOMEAL

**C. UNTYPICAL BEHAVIOUR**

- 1. Lack of common sense E  C  CSENSE1/2
- 2. Other E  C  CINDOTH1/2

**Section ix. Communication – Receptive**

**A. CURRENT LEVEL**

- 1. Understanding of language  ACOMPRESH
- 2. Understanding of concepts relating to future events  AFUTURE
- 3. Appreciation of humour  AHUMOUR

**B. DEVELOPMENTAL STAGES**

- 1. Obeying instructions not dependent on context  BINSTRUC

**C. UNTYPICAL BEHAVIOUR**

- 1. Concern about hearing E  C  CQHEAR
- 2. Response to communication E  C  CRCOMUN1/2
- 3. Literal understanding E  C  CLITUND1/2
- 4. Other E  C  CRECOTH1/2

**Section x. Communication – Expressive**

**A. CURRENT LEVEL**

- 1. Development of expressive language  ADEVEXPR
- 2. Curiosity – asking questions  ACURIO
- 3. Intelligibility – execution of speech  AEXECSP

**B. DEVELOPMENTAL STAGES**

- 1. Meaningful words    BWORDS
- 2. Combining 2-3 words    B3WORDS
- 3. Understood by strangers    BUNSTOOD
- 4. Asking questions  BASKQ

### C. UNTYPICAL BEHAVIOUR

- |   |                            |                            |                   |
|---|----------------------------|----------------------------|-------------------|
| 1. Non-verbal communication                   | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CNVCOM1/2</u>  |
| 2. Using other people as mechanical aids      | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CTOOL1/2</u>   |
| 3. Using doll or puppet                       | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CDOLL1/2</u>   |
| 4. Reciprocal communication in speech         | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CRECIPR1/2</u> |
| 5. Immediate echolalia                        | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CECHOIM1/2</u> |
| 6. Delayed echolalia                          | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CECHODE1/2</u> |
| 7. Reversal of pronouns                       | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CPRONOU1/2</u> |
| 8. Idiosyncratic use of words, signs          | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CIDIOSY1/2</u> |
| 9. Long winded, pedantic speech               | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CPEDAN1/2</u>  |
| 10. Muddling of sequence of words and phrases | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CWORDOR1/2</u> |
| 11. Content of speech                         | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CSPCONT1/2</u> |
| 12. Talking to self                           | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CTALKME1/2</u> |
| 13. Other                                     | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CEXPOTH1/2</u> |

### Section xi. Communication – Non-verbal

#### A. CURRENT LEVEL

- |   |                          |                 |
|---|--------------------------|-----------------|
| 1. Understanding of gesture and miming      | <input type="checkbox"/> | <u>AGESTURE</u> |
| 2. Imperative gestures                      | <input type="checkbox"/> | <u>AIMPERAG</u> |
| 3. Declarative gestures (joint referencing) | <input type="checkbox"/> | <u>ADECLARG</u> |
| 4. Use of nodding and shaking head          | <input type="checkbox"/> | <u>ANODSHK</u>  |
| 5. Instrumental gestures                    | <input type="checkbox"/> | <u>AINSTRUG</u> |
| 6. Descriptive gestures                     | <input type="checkbox"/> | <u>ADESCRG</u>  |
| 7. Emotionally expressive gestures          | <input type="checkbox"/> | <u>AEMOTG</u>   |

#### B. DEVELOPMENTAL STAGES

- |  |                          |                |
|--|--------------------------|----------------|
| 1. Indicating object or person to share interest (joint referencing) | <input type="checkbox"/> | <u>BJOINTR</u> |
|--|--------------------------|----------------|

#### C. UNTYPICAL BEHAVIOUR

- |                                    |                            |                            |                   |
|------------------------------------|----------------------------|----------------------------|-------------------|
| 1. Tone of voice                   | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CTONE1/2</u>   |
| 2. Using different voices          | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CVOICEV1/2</u> |
| 3. Copying accents, voices, noises | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CACCENT1/2</u> |
| 4. Smiling on request              | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CVSMILE1/2</u> |
| 5. Facial expression               | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CFACEXP1/2</u> |
| 6. Use of body language            | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CUSENVC1/2</u> |
| 7. Other                           | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>CNVOTH1/2</u>  |

### Section xii. Social interaction – With adults

#### A. CURRENT LEVEL

- |                          |                          |                 |
|--------------------------|--------------------------|-----------------|
| 1. Preference for carers | <input type="checkbox"/> | <u>APRFCARE</u> |
|--------------------------|--------------------------|-----------------|



**B. DEVELOPMENTAL STAGES**

- 1. Selective social attachment  BAFECTN

**C. UNTYPICAL BEHAVIOUR**

- 1. Awareness of own identity E  C  CIDENT1/2
- 2. Response to physical affection E  C  CCUDLIK1/2
- 3. Greeting parents/carers E  C  CGREETP1/2
- 4. Response to visitors E  C  CREPVIS1/2
- 5. Seeking comfort when in pain or distress E  C  CPAINR1/2
- 6. Giving comfort to others E  C  CGIVEC1/2
- 7. One sided social approaches E  C  CONESID1/2
- 8. Awareness of others' feelings E  C  CEMPATH1/2
- 9. Laughs at others' distress E  C  CLAUGHX1/2
- 10. Response to change caused by injury E  C  CRSINJ1/2
- 11. Reaction to others' happiness E  C  CSHAPY1/2
- 12. Sharing interests and enjoyment E  C  CSHAREP1/2
- 13. Eye contact E  C  CEYECON1/2
- 14. Brief glances E  C  CGLANCE1/2
- 15. Blank, unfocussed gaze E  C  CBLANK1/2
- 16. Stares too long and hard E  C  CSTARES1/2
- 17. Other E  C  CSOCOTH1/2

**Section xiii. Social interaction – With age peers**

**A. CURRENT LEVEL**

- 1. Type of social interaction  ATYPSOC

**B. DEVELOPMENTAL STAGES**

- 1. Watches age peers with interest  BWATCH
- 2. Spontaneously joins in with age peers  BSPON

**C. UNTYPICAL BEHAVIOUR**

- 1. Avoidance of age peers E  C  DPEERIN1/2
- 2. Interaction with age peers E  C  DINPEER1/2
- 3. Preferred companions E  C  DPREFCS1/2
- 4. Quality of interaction E  C  DOUALIN1/2
- 5. Inappropriate sociability E  C  CINAPP1/2
- 6. Emotional response to age peers E  C  DEMPEER1/2
- 7. Conventions of peer interaction E  C  DHOST1/2
- 8. Using age peers as mechanical aids E  C  DPEERAD1/2
- 9. Friendship with age peers E  C  DFRIEND1/2
- 10. Quality of friendship E  C  DOUALFR1/2
- 11. Bullying and teasing by age peers E  C  DTEASE1/2

12. Attitude to pets E  C  CPETS1/2  
 13. Other E  C  DPEEROT1/2

**Section xiv. Social play or leisure activities**

**A. CURRENT LEVEL**

1. Type of social play or leisure activities  ATYPLAY  
 2. Group or team games  ATEAM  
 3. Board games  ABOARD

**B. DEVELOPMENTAL STAGES**

1. Parallel play or leisure activities  BPARPLAY  
 2. Co-operative play or leisure activities  BCOOPLAY

**C. UNTYPICAL BEHAVIOUR**

1. Simple physical play E  C  DPHPLAY1/2  
 2. Taking turns E  C  DTURNS1/2  
 3. Reaction to losing E  C  DLOSING1/2  
 4. Social activities of older children E  C  DOLDCH1/2  
 5. Other E  C  DSOC POT1/2

**Section xv. Imagination**

**A. CURRENT LEVEL**

1. Imitation of social and domestic actions  ADOMIMI  
 2. Imaginative activities  AIMAGACT  
 3. Role play  AROLE

**B. DEVELOPMENTAL STAGES**

1. Waving good-bye  BBYELATE  
 2. Simple pretend play alone  BPLAYAL  
 3. Role play with age peers  BROLEPL

**C. UNTYPICAL BEHAVIOUR**

1. Repetitive pretend play E  C  CPRETEN1/2  
 2. Repetitive acting out roles E  C  CTROL1/2  
 3. Other E  C  CIMAGOT1/2

**Section xvi. Visuo-manual and spatial skills**

**A. CURRENT LEVEL**

1. Use of hands  AHANDS  
 2. Hand-eye coordination  AHEYE  
 3. Visuo-spatial skills   AVISUSP  
 4. Use of scissors  ASCISS  
 5. Three-dimensional modelling  AMODEL  
 6. Drawing – executive skill  ADRAWEX  
 7. Drawing – content  ADRAW

## B. DEVELOPMENTAL STAGES

1. Jigsaws of 10 or more pieces  BJIGSAW
2. Drawing recognisable objects/people  BDRAWSY

## C. UNTYPICAL BEHAVIOUR

1. Unusual dexterity E  C  CDEXTER1/2
2. Clumsiness with fine motor tasks E  C  CFINEMT1/2
3. Reluctance to use hands E  C  CNOHAND1/2
4. Reluctance to draw/use pencils E  C  CNODRAW1/2
5. Other E  C  CVMSOTH1/2

## Section xvii. Pictures, reading, writing

### A. CURRENT LEVEL

1. Understanding of pictures  APICOMP
2. Reading  AREAD
3. Writing/typing etc  AWRITE

### B. DEVELOPMENTAL STAGES

1. Identifying objects in pictures  BIDOBJ
2. Reading first books (5-6 year level)  BREAD
3. Writing/typing some words without copying  BWRITE

### C. UNTYPICAL BEHAVIOUR

1. Interest in specific pictures E  C  CSPICT1/2
2. Interest in letters and/or words E  C  CSPLETS1/2
3. Interest in reading E  C  CREAD1/2
4. Understanding of reading material E  C  CREADU1/2
5. Type of reading material E  C  CREADTY1/2
6. Interest in writing E  C  CWRITE1/2
7. Specific reading/spelling impairment E  C  CDYSLEX1/2
8. Other E  C  CSYMOTH1/2

## Section xviii. Cognitive skills and achievements

### A. CURRENT LEVEL

1. IQ estimate  IQEST
2. Language level  LANGEST
3. Numbers  ANOS
4. Money  AMONEY
5. Identifying coins  ACOINS
6. Days, months, years  ADATES
7. Telling the time by the clock  ATIME



## B. DEVELOPMENTAL STAGES

- |                                      |                          |         |
|--------------------------------------|--------------------------|---------|
| 1. Simple addition                   | <input type="checkbox"/> | BADDIT  |
| 2. Identifying coins                 | <input type="checkbox"/> | BCOINID |
| 3. Knowing names of the days         | <input type="checkbox"/> | BDAYID  |
| 4. Hours and half hours on the clock | <input type="checkbox"/> | BHOURS  |

## C. UNUSUAL SKILLS AND INTERESTS

### 1. Special skills

- |                                    |                            |                            |            |
|------------------------------------|----------------------------|----------------------------|------------|
| a Sings                            | E <input type="checkbox"/> | C <input type="checkbox"/> | CSINGS1/2  |
| b Plays musical instrument         | E <input type="checkbox"/> | C <input type="checkbox"/> | CMUSIC1/2  |
| c Composes music                   | E <input type="checkbox"/> | C <input type="checkbox"/> | CCOMPOS1/2 |
| d Numerical calculations           | E <input type="checkbox"/> | C <input type="checkbox"/> | CCALCUN1/2 |
| e Calendar calculations            | E <input type="checkbox"/> | C <input type="checkbox"/> | CCALCUC1/2 |
| f Visuo-spatial puzzles            | E <input type="checkbox"/> | C <input type="checkbox"/> | CVISPAT1/2 |
| g Computers                        | E <input type="checkbox"/> | C <input type="checkbox"/> | CCOMPUT1/2 |
| h Constructional                   | E <input type="checkbox"/> | C <input type="checkbox"/> | CCONSTR1/2 |
| i Drawing                          | E <input type="checkbox"/> | C <input type="checkbox"/> | CDRAWSP1/2 |
| j Maps                             | E <input type="checkbox"/> | C <input type="checkbox"/> | CMAPS1/2   |
| k Operating equipment, e.g. videos | E <input type="checkbox"/> | C <input type="checkbox"/> | COPERAT1/2 |
| l Memory for verbal material       | E <input type="checkbox"/> | C <input type="checkbox"/> | CMEMAUD1/2 |
| m Memory for routes                | E <input type="checkbox"/> | C <input type="checkbox"/> | CMEMVIS1/2 |
| n Memory for past events           | E <input type="checkbox"/> | C <input type="checkbox"/> | CMEMEVE1/2 |
| o Other                            | E <input type="checkbox"/> | C <input type="checkbox"/> | CSPSOTH1/2 |
| 2. Liking music                    | E <input type="checkbox"/> | C <input type="checkbox"/> | CMUSLIK1/2 |
| 3. Other unusual aspects of skills | E <input type="checkbox"/> | C <input type="checkbox"/> | CSPECOT1/2 |

## PART 4 REPETITIVE STEREOTYPED ACTIVITIES

### Section i. Stereotyped movements and vocalisations

- |                                       |                            |                            |                  |
|---------------------------------------|----------------------------|----------------------------|------------------|
| 1. Jumping                            | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>JUMP1/2</u>   |
| 2. Unusual movements of hands or arms | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>HANDUN1/2</u> |
| 3. Midline hand stereotypies          | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>MIDHD1/2</u>  |
| 4. Self-spinning                      | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>SPIN1/2</u>   |
| 5. Rocking (sitting)                  | E <input type="checkbox"/> | C <input type="checkbox"/> | ROCK1/2          |
| 6. Rocking (standing up)              | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>ROCKUP1/2</u> |
| 7. Complex movements                  | E <input type="checkbox"/> | C <input type="checkbox"/> | <u>MOVEM1/2</u>  |
| 8. Tip-toe walking                    | E <input type="checkbox"/> | C <input type="checkbox"/> | TIPTOE1/2        |
| 9. Sudden jerky movements             | E <input type="checkbox"/> | C <input type="checkbox"/> | JERKY1/2         |
| 10. Shrieks and other odd noises      | E <input type="checkbox"/> | C <input type="checkbox"/> | SHRIEK1/2        |
| 11. Facial grimaces                   | E <input type="checkbox"/> | C <input type="checkbox"/> | GRIMA1/2         |
| 12. Other                             | E <input type="checkbox"/> | C <input type="checkbox"/> | STEREOT1/2       |

## Section ii. Responses to proximal sensory stimuli

- |  |   |                          |   |                          |                   |
|--|---|--------------------------|---|--------------------------|-------------------|
| 1. Smearing                                    | E | <input type="checkbox"/> | C | <input type="checkbox"/> | SMEARS1/2         |
| 2. Mouthing or swallowing of objects           | E | <input type="checkbox"/> | C | <input type="checkbox"/> | MOUTH1/2          |
| 3. Self injury                                 | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>SIB1/2</u>     |
| 4. Self stimulation without injury             | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>SELFST1/2</u>  |
| 5. Smelling objects or people                  | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>SMELL1/2</u>   |
| 6. Touching objects                            | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>TOUCH1/2</u>   |
| 7. Scratching and tapping surfaces             | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>SCRATCH1/2</u> |
| 8. Repetitive destructive activities           | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>REPDEST1/2</u> |
| 9. Repetitive, aimless manipulation of objects | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>MANIP1/2</u>   |
| 10. Being spun round                           | E | <input type="checkbox"/> | C | <input type="checkbox"/> | SPUN1/2           |
| 11. Indifference to pain, heat, cold           | E | <input type="checkbox"/> | C | <input type="checkbox"/> | PAININD1/2        |
| 12. Reaction to gentle touch                   | E | <input type="checkbox"/> | C | <input type="checkbox"/> | GENTLE1/2         |
| 13. Reaction to firm touch                     | E | <input type="checkbox"/> | C | <input type="checkbox"/> | FIRM1/2           |
| 14. Overbreathing                              | E | <input type="checkbox"/> | C | <input type="checkbox"/> | BREATH1/2         |
| 15. Other                                      | E | <input type="checkbox"/> | C | <input type="checkbox"/> | SENSOTH1/2        |

## Section iii. Responses to auditory stimuli

- |                              |   |                          |   |                          |                  |
|------------------------------|---|--------------------------|---|--------------------------|------------------|
| 1. Distress caused by sounds | E | <input type="checkbox"/> | C | <input type="checkbox"/> | AUDIST1/2        |
| 2. Fascination with sounds   | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>AUDFAS1/2</u> |
| 3. Acuteness of hearing      | E | <input type="checkbox"/> | C | <input type="checkbox"/> | HEARAC1/2        |
| 4. Other                     | E | <input type="checkbox"/> | C | <input type="checkbox"/> | AUDOTH1/2        |

## Section iv. Responses to visual stimuli

- |  |   |                          |   |                          |                   |
|--|---|--------------------------|---|--------------------------|-------------------|
| 1. Bright lights and shiny objects     | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>LIGHTS1/2</u>  |
| 2. Interest in watching things spin    | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>SPINVIS1/2</u> |
| 3. Twisting hands or objects near eyes | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>TWISTH1/2</u>  |
| 4. Interest in studying angles         | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>ANGLES1/2</u>  |
| 5. Other                               | E | <input type="checkbox"/> | C | <input type="checkbox"/> | VISOTH1/2         |

## Section v. Routines and resistance to change

- |  |   |                          |   |                          |                  |
|--|---|--------------------------|---|--------------------------|------------------|
| 1. Clinging to objects                       | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>OBJCLG1/2</u> |
| 2. Collecting objects                        | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>OBJCOL1/2</u> |
| 3. Fascination with specific objects         | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>OBJFAS1/2</u> |
| 4. Arranging objects                         | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>OBJARR1/2</u> |
| 5. Interest in parts of objects              | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>OBJPTS1/2</u> |
| 6. Elaborate repetitive actions with objects | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>OBJREP1/2</u> |
| 7. Abstract properties of objects            | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>OBJABS1/2</u> |
| 8. Maintenance of sameness of environment    | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>SAMENV1/2</u> |
| 9. Insistence on perfection                  | E | <input type="checkbox"/> | C | <input type="checkbox"/> | <u>PERF1/2</u>   |

- |   |   |                   |
|---|---|-------------------|
| 10. Food fads                             | E <input type="checkbox"/> C <input type="checkbox"/> | <u>FADDY1/2</u>   |
| 11. Maintenance of sameness in routines   | E <input type="checkbox"/> C <input type="checkbox"/> | <u>SAMERT1/2</u>  |
| 12. Clinging to home                      | E <input type="checkbox"/> C <input type="checkbox"/> | <u>CLINGH1/2</u>  |
| 13. Repetitive questions                  | E <input type="checkbox"/> C <input type="checkbox"/> | <u>QUESREP1/2</u> |
| 14. Repetitive themes                     | E <input type="checkbox"/> C <input type="checkbox"/> | <u>THEMREP1/2</u> |
| 15. Activities related to special skills  | E <input type="checkbox"/> C <input type="checkbox"/> | <u>ACTSPSK1/2</u> |
| 16. Collecting facts on specific subjects | E <input type="checkbox"/> C <input type="checkbox"/> | <u>FACTCOL1/2</u> |
| 17. Fascination with TV/videos            | E <input type="checkbox"/> C <input type="checkbox"/> | <u>TVFAS1/2</u>   |
| 18. Intense interest in a person          | E <input type="checkbox"/> C <input type="checkbox"/> | <u>PERS1/2</u>    |
| 19. Other                                 | E <input type="checkbox"/> C <input type="checkbox"/> | <u>ROUTOTH1/2</u> |

**Section vi. Overall pattern of activities**

- |  |   |                   |
|--|---|-------------------|
| 1. Limited pattern of self-chosen activities | E <input type="checkbox"/> C <input type="checkbox"/> | <u>LTDACT1/2</u>  |
| 2. Attention span (self-chosen activities)   | E <input type="checkbox"/> C <input type="checkbox"/> | <u>ATTENTS1/2</u> |
| 3. Attention span (other activities)         | E <input type="checkbox"/> C <input type="checkbox"/> | <u>ATTENTO1/2</u> |
| 4. Memory                                    | E <input type="checkbox"/> C <input type="checkbox"/> | <u>MEMORY1/2</u>  |
| 5. Inability to remain sitting               | E <input type="checkbox"/> C <input type="checkbox"/> | <u>INABSIT1/2</u> |
| 6. Continual motor restlessness              | E <input type="checkbox"/> C <input type="checkbox"/> | <u>RESTL1/2</u>   |
| 7. Hyperactivity                             | E <input type="checkbox"/> C <input type="checkbox"/> | <u>HYPACT1/2</u>  |
| 8. Fixed, repeated motor stereotypies        | E <input type="checkbox"/> C <input type="checkbox"/> | <u>STEREOC1/2</u> |
| 9. Excessive repetition of activities        | E <input type="checkbox"/> C <input type="checkbox"/> | <u>REPACTC1/2</u> |
| 10. Other                                    | E <input type="checkbox"/> C <input type="checkbox"/> | <u>ACTIVOT1/2</u> |

**PART 5 EMOTIONS**

**Section i. Emotions**

- |                                 |   |                   |
|---------------------------------|---|-------------------|
| 1. Lack of emotional expression | E <input type="checkbox"/> C <input type="checkbox"/> | <u>LACKEXP1/2</u> |
| 2. Unhappiness, misery          | E <input type="checkbox"/> C <input type="checkbox"/> | <u>MISERY1/2</u>  |
| 3. Changeable mood              | E <input type="checkbox"/> C <input type="checkbox"/> | <u>MOODCH1/2</u>  |
| 4. Crying and moaning           | E <input type="checkbox"/> C <input type="checkbox"/> | <u>MOAN1/2</u>    |
| 5. Laughing for no reason       | E <input type="checkbox"/> C <input type="checkbox"/> | <u>LAUGH1/2</u>   |
| 6. Puzzlement                   | E <input type="checkbox"/> C <input type="checkbox"/> | <u>PUZZLE1/2</u>  |
| 7. Anxiety                      | E <input type="checkbox"/> C <input type="checkbox"/> | <u>ANXIETY1/2</u> |
| 8. Special Fears                | E <input type="checkbox"/> C <input type="checkbox"/> | <u>FEARS1/2</u>   |
| 9. Other                        | E <input type="checkbox"/> C <input type="checkbox"/> | <u>EMOTOTH1/2</u> |

**PART 6 MALADAPTIVE BEHAVIOUR**

**Section i. Behaviour affecting others**

- |                        |   |                   |
|------------------------|---|-------------------|
| 1. Wandering           | E <input type="checkbox"/> C <input type="checkbox"/> | <u>WANDER1/2</u>  |
| 2. Destructiveness     | E <input type="checkbox"/> C <input type="checkbox"/> | <u>DESTRUC1/2</u> |
| 3. Noisiness           | E <input type="checkbox"/> C <input type="checkbox"/> | <u>NOISE1/2</u>   |
| 4. Temper tantrums     | E <input type="checkbox"/> C <input type="checkbox"/> | <u>TEMPER1/2</u>  |
| 5. Physical aggression | E <input type="checkbox"/> C <input type="checkbox"/> | <u>AGGRESS1/2</u> |



- |  |   |                          |   |                          |            |
|--|---|--------------------------|---|--------------------------|------------|
| 6. Anger towards parents                       | E | <input type="checkbox"/> | C | <input type="checkbox"/> | ANGERP1/2  |
| 7. Blaming other people                        | E | <input type="checkbox"/> | C | <input type="checkbox"/> | BLAME1/2   |
| 8. Harassment of others                        | E | <input type="checkbox"/> | C | <input type="checkbox"/> | HARAS1/2   |
| 9. Behaviour in public places                  | E | <input type="checkbox"/> | C | <input type="checkbox"/> | BEHAPUB1/2 |
| 10. Personal modesty                           | E | <input type="checkbox"/> | C | <input type="checkbox"/> | MODEST1/2  |
| 11. Psychological barriers                     | E | <input type="checkbox"/> | C | <input type="checkbox"/> | PSYCHOB1/2 |
| 12. Approaching strangers                      | E | <input type="checkbox"/> | C | <input type="checkbox"/> | TALKSR1/2  |
| 13. Embarrassing remarks in public             | E | <input type="checkbox"/> | C | <input type="checkbox"/> | REMARK1/2  |
| 14. Interrupting conversations                 | E | <input type="checkbox"/> | C | <input type="checkbox"/> | INTERP1/2  |
| 15. Inappropriate response to others' emotions | E | <input type="checkbox"/> | C | <input type="checkbox"/> | PARADX1/2  |
| 16. Difficult or objectionable personal habits | E | <input type="checkbox"/> | C | <input type="checkbox"/> | HABITS1/2  |
| 17. Scatters or throws objects around          | E | <input type="checkbox"/> | C | <input type="checkbox"/> | SCATTER1/2 |
| 18. Lack of co-operation                       | E | <input type="checkbox"/> | C | <input type="checkbox"/> | LACKCOP1/2 |
| 19. Needs constant supervision                 | E | <input type="checkbox"/> | C | <input type="checkbox"/> | SUPERV1/2  |
| 20. Apparently manipulative behaviour          | E | <input type="checkbox"/> | C | <input type="checkbox"/> | MANIP1/2   |
| 21. Demands carer's attention                  | E | <input type="checkbox"/> | C | <input type="checkbox"/> | ATTSEEK1/2 |
| 22. Difficulties with other people             | E | <input type="checkbox"/> | C | <input type="checkbox"/> | DIFPEOP1/2 |
| 23. Socially shocking behaviour                | E | <input type="checkbox"/> | C | <input type="checkbox"/> | SHOCK1/2   |
| 24. Lying, cheating, stealing                  | E | <input type="checkbox"/> | C | <input type="checkbox"/> | LYING1/2   |
| 25. Other                                      | E | <input type="checkbox"/> | C | <input type="checkbox"/> | BEHSOTH1/2 |

### Section ii. Sleep disturbances

- |                                   |   |                          |   |                          |            |
|-----------------------------------|---|--------------------------|---|--------------------------|------------|
| 1. Night sedation                 | E | <input type="checkbox"/> | C | <input type="checkbox"/> | NIGHSED1/2 |
| 2. Difficulty in falling asleep   | E | <input type="checkbox"/> | C | <input type="checkbox"/> | GOSLEEP1/2 |
| 3. Difficulty in remaining asleep | E | <input type="checkbox"/> | C | <input type="checkbox"/> | STAYSLP1/2 |
| 4. Night terrors or nightmares    | E | <input type="checkbox"/> | C | <input type="checkbox"/> | TERROR1/2  |
| 5. Other                          | E | <input type="checkbox"/> | C | <input type="checkbox"/> | SLPOTH1/2  |

## PART 7 QUALITY OF SOCIAL INTERACTION

### Section i. Quality of social interaction

- |                                  |   |                          |  |                          |          |
|----------------------------------|---|--------------------------|--|--------------------------|----------|
|                                  | E | <input type="checkbox"/> |  | <input type="checkbox"/> | QUALSOC1 |
| 1. Quality of social interaction | C | <input type="checkbox"/> |  | <input type="checkbox"/> | QUALSOC2 |

## PART 8 PSYCHIATRIC DISORDERS AND FORENSIC PROBLEMS

### Section i. Catatonic features

- |   |   |                          |   |                          |            |
|---|---|--------------------------|---|--------------------------|------------|
| 1. Peculiar hand postures                   | E | <input type="checkbox"/> | C | <input type="checkbox"/> | HDPOST1/2  |
| 2. Interruption of ongoing motor activities | E | <input type="checkbox"/> | C | <input type="checkbox"/> | INTRMOT1/2 |
| 3. Repeated approach and withdrawal         | E | <input type="checkbox"/> | C | <input type="checkbox"/> | TOFRO1/2   |
| 4. Turning up of the eyes                   | E | <input type="checkbox"/> | C | <input type="checkbox"/> | EYESUP1/2  |
| 5. Impulsive behaviour                      | E | <input type="checkbox"/> | C | <input type="checkbox"/> | IMPBEH1/2  |

- |  |   |                   |
|--|---|-------------------|
| 6. Lack of spontaneous activity        | E <input type="checkbox"/> C <input type="checkbox"/> | SPONACT1/2        |
| 7. Problems when walking               | E <input type="checkbox"/> C <input type="checkbox"/> | <u>WALKPRO1/2</u> |
| 8. Immediate echopraxia                | E <input type="checkbox"/> C <input type="checkbox"/> | ECHOPR1/2         |
| 9. Other unusual postures or movements | E <input type="checkbox"/> C <input type="checkbox"/> | CATAOTH1/2        |

**Section ii. Sexual problems**

- |   |   |            |
|---|---|------------|
| 1. Masturbation in public                   | E <input type="checkbox"/> C <input type="checkbox"/> | MASTURB1/2 |
| 2. Inappropriate heterosexual behaviour     | E <input type="checkbox"/> C <input type="checkbox"/> | HETERO1/2  |
| 3. Inappropriate homosexual behaviour       | E <input type="checkbox"/> C <input type="checkbox"/> | HOMO1/2    |
| 4. Sexual interest in much younger children | E <input type="checkbox"/> C <input type="checkbox"/> | PAEDO1/2   |
| 5. Indecent exposure                        | E <input type="checkbox"/> C <input type="checkbox"/> | EXPOSE1/2  |
| 6. Other inappropriate sexual behaviour     | E <input type="checkbox"/> C <input type="checkbox"/> | SEXOTH1/2  |

**Section iii. Psychiatric conditions**

- |   |   |            |
|---|---|------------|
| 1. Depression                                     | E <input type="checkbox"/> C <input type="checkbox"/> | DEPR1/2    |
| 2. Mania or hypomania                             | E <input type="checkbox"/> C <input type="checkbox"/> | MANIA1/2   |
| 3. Anxiety state                                  | E <input type="checkbox"/> C <input type="checkbox"/> | ANXST1/2   |
| 4. Hypochondriasis                                | E <input type="checkbox"/> C <input type="checkbox"/> | HYPOCH1/2  |
| 5. Obsessional neurosis                           | E <input type="checkbox"/> C <input type="checkbox"/> | OBSCESS1/2 |
| 6. Other neurosis (including phobias)             | E <input type="checkbox"/> C <input type="checkbox"/> | NEUROTH1/2 |
| 7. Schizophrenia                                  | E <input type="checkbox"/> C <input type="checkbox"/> | SCHIZO1/2  |
| 8. Schizo-affective disorder                      | E <input type="checkbox"/> C <input type="checkbox"/> | SCHIZAF1/2 |
| 9. Other psychosis                                | E <input type="checkbox"/> C <input type="checkbox"/> | PSYCOTH1/2 |
| 10. Schizoid personality disorder                 | E <input type="checkbox"/> C <input type="checkbox"/> | SCHIPER1/2 |
| 11. Schizotypal disorder                          | E <input type="checkbox"/> C <input type="checkbox"/> | SCHTYP1/2  |
| 12. Anankastic (obsessional) personality disorder | E <input type="checkbox"/> C <input type="checkbox"/> | ANANK1/2   |
| 13. Other personality disorder                    | E <input type="checkbox"/> C <input type="checkbox"/> | PERSONA1/2 |
| 14. Paranoid feelings                             | E <input type="checkbox"/> C <input type="checkbox"/> | PARAN1/2   |
| 15. Organic dementia or confusional state         | E <input type="checkbox"/> C <input type="checkbox"/> | DEMENT1/2  |
| 16. Other psychiatric problems                    | E <input type="checkbox"/> C <input type="checkbox"/> | PSYCHOT1/2 |
| 17. Eating disorders                              | E <input type="checkbox"/> C <input type="checkbox"/> | EATING1/2  |
| 18. Drug abuse                                    | E <input type="checkbox"/> C <input type="checkbox"/> | DRUG 1/2   |
| 19. Alcohol abuse                                 | E <input type="checkbox"/> C <input type="checkbox"/> | ALC1/2     |

**Section iv. Forensic problems**

- |                                    |   |            |
|------------------------------------|---|------------|
| 1. Compulsory hospital admission   | E <input type="checkbox"/> C <input type="checkbox"/> | HOSPAD1/2  |
| 2. Involvement with the police     | E <input type="checkbox"/> C <input type="checkbox"/> | POLICE1/2  |
| 3. Appearances in court            | E <input type="checkbox"/> C <input type="checkbox"/> | COURT1/2   |
| 4. Committal to prison             | E <input type="checkbox"/> C <input type="checkbox"/> | PRISON1/2  |
| 5. Committal to a special hospital | E <input type="checkbox"/> C <input type="checkbox"/> | SPHOSP1/2  |
| 6. Other                           | E <input type="checkbox"/> C <input type="checkbox"/> | LEGALOT1/2 |



# DIAGNOSTIC INTERVIEW FOR SOCIAL AND COMMUNICATION DISORDERS



**DISCO**

Tenth revision

*October 1999*

© Lorna Wing

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## **APPENDIX THREE**

- 1. BEHAVIOURAL OBSERVATION RATING SCHEDULE**
- 2. CRITERIA FOR BEHAVIOURAL RATING SCHEDULE**
- 3. INTER-RATER RELIABILITY COEFFICIENTS**







## **CRITERIA FOR BEHAVIOURAL RATING SCHEDULE**

**P\_\_\_\_\_ (Operational definitions)**

### **Verbal Expression**

The pupil should be able to demonstrate that he or she is able to use an utterance that is within the context of the situation and is grammatically correct. Echolalia or utterances that are not in keeping with the situation should not be rated. In other words, the individual should be able to show that he or she is using language to engage someone for advice, acknowledging a request for information or engaging in social intercourse. Talking to his or herself in an aimless fashion does not count.

### **Verbal Comprehension**

The pupil should be able to provide a response that shows that he or she has understood the utterance posed by the speaker. For instance, acted upon a communication by complying with a particular request, such as, started or stopped writing when told to do so by the teacher. Alternatively, is able to provide a verbal or non-verbal response that shows that he or she has understood a question. Refusing to act on a request does not mean that he or she has not understood it, and teachers have been asked to repeat instructions if necessary. This applies to any speaker (e.g. peer or teacher).

## **Non-Verbal Comprehension**

The pupil must demonstrate that he or she is able to understand non-verbal communication directed at him or her. For instance, returns the smile of someone who has smiled at them or stops talking when the teacher places a finger on her lips when appealing for silence. Sits down when the teacher lowers her hands (palms down to gesture a seating position) or stands up when palms are raised. Nods or shakes head in response to positive or negative signals that are directed at him or her. That is, responds to an encouraging look by smiling or lowers head and eyes in response to a rebuke.

## **Eye Contact**

A score on this requires the pupil to demonstrate that he or she can maintain eye contact for at least 4-6 seconds with another person that he or she is interacting with. To be scored the eye contact must consist of more than just a fleeting glance or the use of peripheral vision. In other words, the eye contact must represent an aspect of two-way communication where interpersonal signals are being passed between the individuals concerned. If the pupils avoids eye contact by averting his or her eyes this does not count. For a score the pupils must hold eye contact for the duration referred to above.

## **Play**

The pupil must demonstrate that he or she is able to join in an activity that involves a genuine two-way interaction, where the sharing of a toy, game or task is seen. The pupil may demonstrate this by the use of puppets to communicate with each other or use a toy telephone to communicate with an imaginary person. Turn-taking following group rules will count as in board games or group activities where co-operation is important to the task in question.

## **Adaptation to Change in Routines / Activities**

The pupil is able to demonstrate that he or she is able to move from one task or routine to another without becoming upset, awkward or disruptive. Whilst disappointment is acceptable there should be a reasonably quick transition to the new activity without too much fuss. In reality the pupil should be able to move from one task to another or from one topic to another or to a different situation. Score only evidence of ability to change a routine or adapt to a different situation in the absence of dissent or a tantrum



## **Peer Interaction / Socialisation**

Pupil shows that he or she is able to interact with others in various activities within the group settings. The interactional behaviour should contain a quality of co-operation and participation by the pupil concerned. He or she should present as reasonably confident and appear to be accepted as an equal member of the group. As with other concerns any evidence of excessive shyness or withdrawn behaviour should be noted on the observation sheet.

## **Listening Skills**

Pupil is able demonstrate that her or she can to listen to others. There should be evidence from the pupil's behaviour that he or she has listened to another person and acted upon the received message or information. For instance, acknowledges an instruction and responds appropriately by word or action (including gesture or facial expressions). In other words, the pupil must show evidence of having listened and followed the exchange of ideas within the communication process. Day-dreaming or just staring or gazing at the speaker does not count. Evidence may consist of an action based on the message or a request by the participant for clarification of the information or even a verbal refusal to comply.



**Table A 1 Inter-Rater Reliability Coefficients Showing a High Level of Accuracy Between Raters 1 and 2 During the Training Period**

	Rater 1 scores rank		Rater 2 scores rank		d	d <sup>2</sup>
Verbal expression	3	1	3	1	0	0
Verbal comprehension	2	2	1	3	1	1
Non-verbal comprehension	1	4	1	3	1	1
Eye contact	2	2	2	2	0	0
Play	0	7	0	7	0	0
Adaptation to change in routine / activities	1	4	1	3	1	1
Peer interaction / socialisation	0	7	0	7	0	0
Listening skills	1	4	1	3	1	1

Using Spearman's rank order correlation thus:

$$r = 1 - \frac{6 \sum d^2}{N(N^2 - 1)} = \frac{6 \times 4}{8(64 - 1)} = \frac{24}{504} = 0.047619$$

$$r = 1 - 0.047619 \quad r = 0.95$$

**Table A 2 Inter-Rater Reliability Coefficients Showing a High Level of Accuracy Between Raters 3 and 4 During the Training Period**

	Rater 3 scores rank		Rater 4 scores rank		d	d <sup>2</sup>
Verbal expression	3	1	3	1	0	0
Verbal comprehension	3	1	2	3	2	4
Non-verbal comprehension	1	4	1	5	2	4
Eye contact	3	1	3	1	0	0
Play	0	7	0	7	0	0
Adaptation to change in routine / activities	0	7	0	7	0	0
Peer interaction / socialisation	1	4	1	5	1	1
Listening skills	1	4	2	3	1	1

$$r = 1 - \frac{6 \sum d^2}{N(N^2 - 1)} = \frac{6 \times 10}{8(64 - 1)} = \frac{60}{504} = 0.1190476$$

$$r = 1 - 0.1190476 \quad r = 0.88$$



**Table A 3 Inter-Rater Reliability Coefficients Showing a High Level of Accuracy Between Raters 5 and 6 During the Training Period**

	Rater 5		Rater 6		d	d <sup>2</sup>
	scores	rank	scores	rank		
Verbal expression	3	1	3	1	0	0
Verbal comprehension	3	1	2	3	2	4
Non-verbal comprehension	2	4	2	3	1	1
Eye contact	3	1	3	1	0	0
Play	0	7	0	7	0	0
Adaptation to change in routine / activities	1	6	1	5	1	1
Peer interaction / socialisation	0	7	0	7	0	0
Listening skills	2	4	1	5	1	1

$$r = 1 - \frac{6 \sum d^2}{N(N^2 - 1)} = \frac{6 \times 7}{8(64 - 1)} = \frac{42}{504} = 0.083333$$

$$r = 1 - 0.083333 \quad r = 0.92$$

**APPENDIX FOUR**  
**(RECORDING INSTRUMENTS)**

- 1. WECHSLER INTELLIGENCE SCALE FOR CHILDREN**
- 2. WECHSLER OBJECTIVE READING DIMENSIONS**
- 3. SELF-REPORT SCHEDULE**
- 4. SITUATION CARD TEST**



**WISC-III<sup>UK</sup>**

**Wechsler Intelligence Scale for Children  
Third Edition UK**

David Wechsler

**Record Form**



**The Psychological Corporation**  
*Harcourt Brace & Company Publishers*



# WISC-III<sup>UK</sup>

Wechsler Intelligence Scale for Children—Third Edition UK

## WISC-III<sup>UK</sup> Scaled score profile 1

	Verbal						Performance						
	Inf	Sim	Ari	Voc	Com	DS	PC	Cd	PA	BD	OA	SS	Mz
19	.	.	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.
1	.	.	.	.	.	.	.	.	.	.	.	.	.

Name .....

Gender .....

School .....

Year .....

Examiner .....

Handedness .....

	Year	Month	Day
Date tested			
Date of birth			
Age			

Subtests	Raw scores	Scaled scores					
		Verb.	Perf.	VC	PO	FD	PS
Picture Completion							
Information							
Coding							
Similarities							
Picture Arrangement							
Arithmetic							
Block Design							
Vocabulary							
Object Assembly							
Comprehension							
(Symbol Search)		( )					
(Digit Span)		( )					
(Mazes)		( )					
Sum of scaled scores							
		Full scale score					

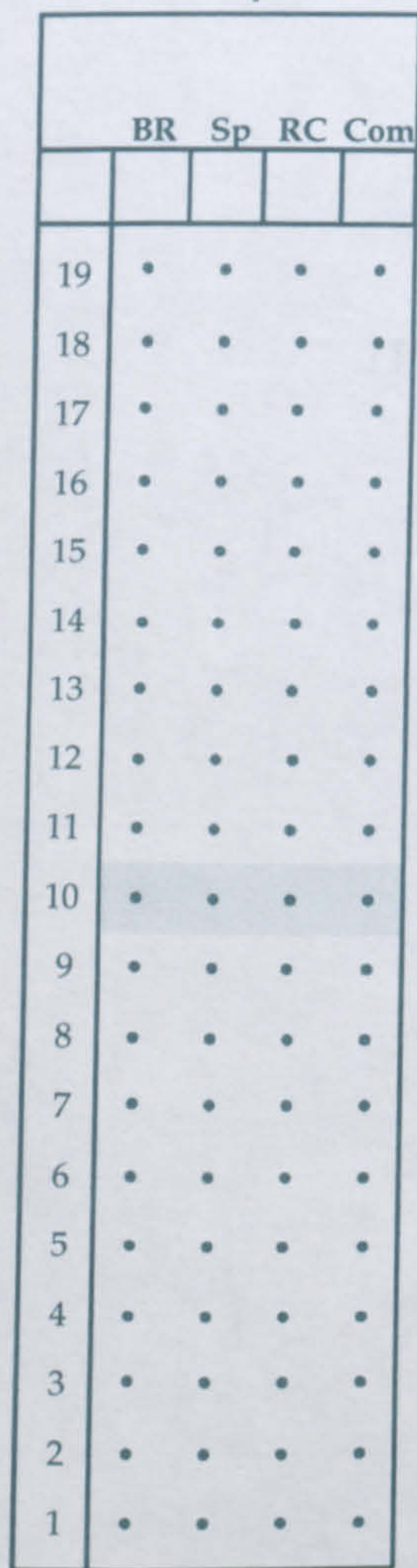
## WISC-III<sup>UK</sup> Scaled score profile 2 (optional)

	VCI				POI				FDI		PSI	
	Inf	Sim	Voc	Com	PC	PA	BD	OA	Ari	DS	Cd	SS
19	.	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.
1	.	.	.	.	.	.	.	.	.	.	.	.

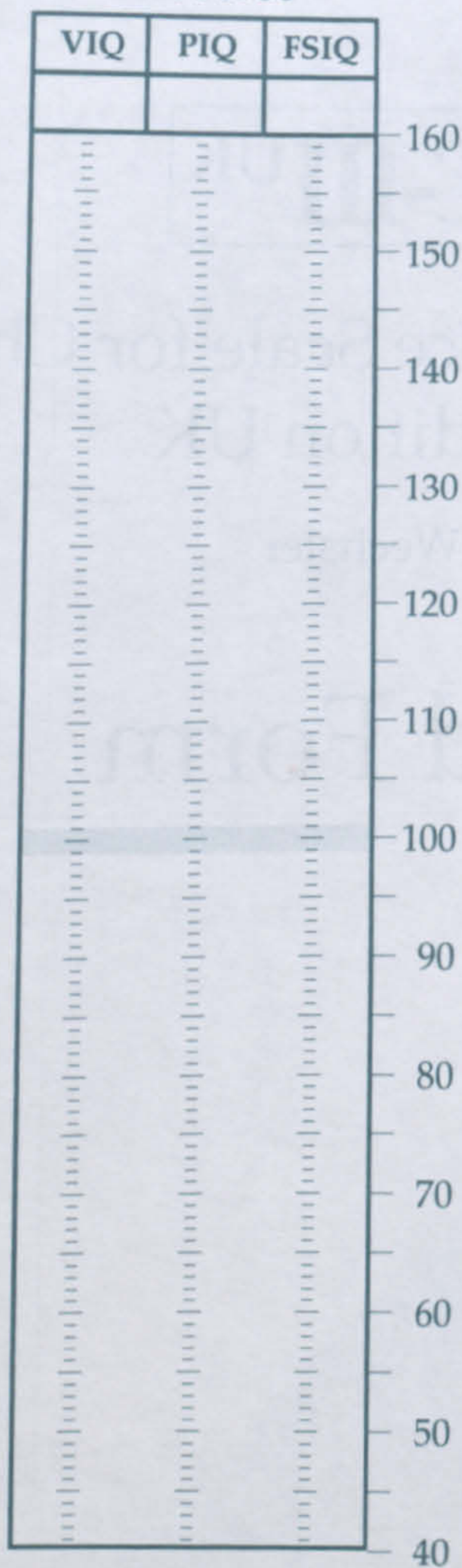
	Score	IQ/ Index	%ile	% confidence interval
Verbal				-
Performance				-
Full Scale				-
VC				-
PO				-
FD				-
PS				-



**WORD profile\***



**IQ scores**



**Subtest score evaluation**

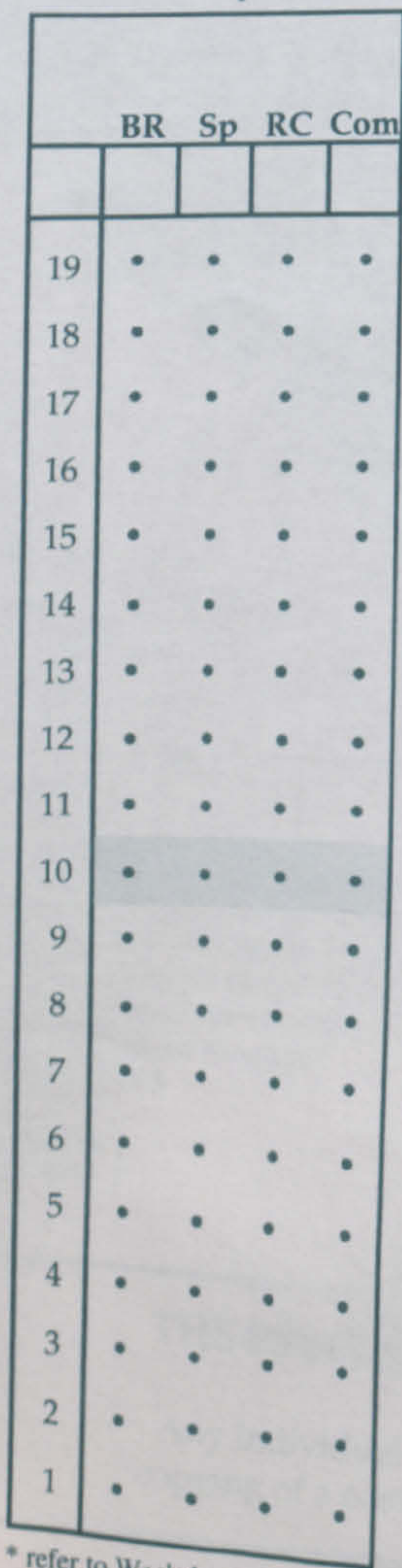
Tables 1a and 1b show the minimum difference between any single subtest scaled score and the average scaled score of the group of subtests against which it is being compared that is required to achieve statistical significance. Differences are presented for two levels of confidence: 0.15 and 0.05. For example, as indicated in Table 1a, a Picture Completion scaled score that is at least 3.31 points above the child's average scaled score on five Performance subtests is significantly different from that mean score at the 0.05 level of confidence.

Table 2 provides similar information for interpreting the difference between a single subtest scaled score and the mean score on the subtests contributing to the two major factor-based indexes, Verbal Comprehension and Perceptual Organisation. For a fuller discussion of these scores see Chapter 4 in the WISC-III<sup>UK</sup> Manual.

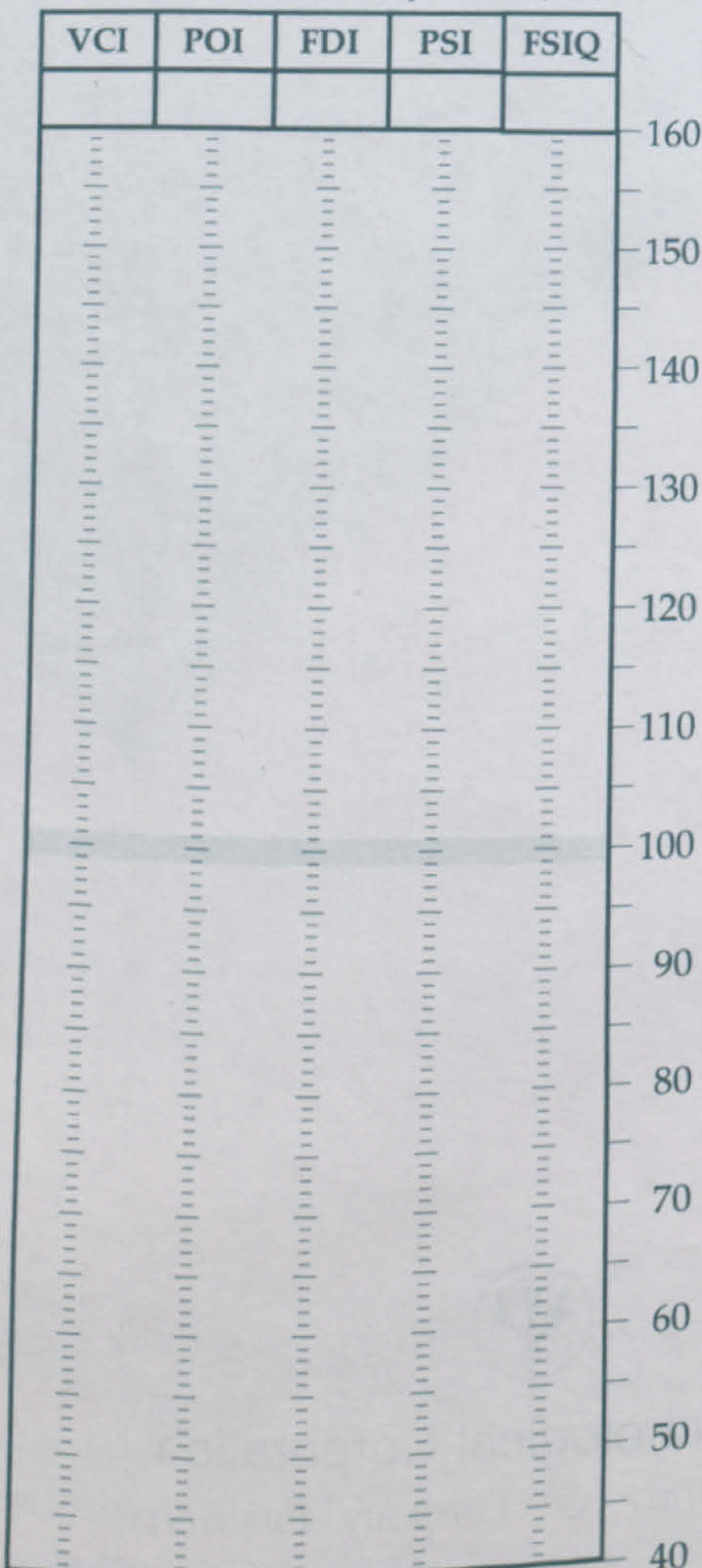
*Table 1a*

Significance level	Average of 5 subtests		Average of 6 subtests		Average of 7 subtests	
	0.15	0.05	0.15	0.05	0.15	0.05
Information	2.42	2.88	2.54	2.99		
Similarities	2.52	3.00	2.65	3.12		
Arithmetic	2.69	3.19	2.83	3.34		
Vocabulary	2.21	2.62	2.30	2.70		
Comprehension	2.74	3.26	2.90	3.41		
Digit Span			2.44	2.87		
Picture Completion	2.79	3.31	2.95	3.47	3.08	3.60
Coding	2.76	3.28	2.91	3.43	3.04	3.56
Picture Arrangement	2.85	3.38	3.01	3.55	3.15	3.68
Block Design	2.33	2.76	2.42	2.85	2.51	2.93
Object Assembly	3.13	3.72	3.33	3.92	3.49	4.08
Symbol Search			3.01	3.55	3.15	3.68
Mazes					3.44	4.02

**WORD profile\***



**Index scores (optional)**



*Table 1b*

Significance level	Average of 10 subtests		Average of 12 subtests		Average of 13 subtests	
	0.15	0.05	0.15	0.05	0.15	0.05
Information	2.88	3.32	2.97	3.41	3.02	3.45
Similarities	3.02	3.48	3.12	3.58	3.17	3.63
Arithmetic	3.24	3.74	3.36	3.86	3.42	3.91
Vocabulary	2.58	2.97	2.65	3.04	2.69	3.08
Comprehension	3.33	3.84	3.45	3.96	3.51	4.01
Digit Span			2.84	3.26	2.89	3.30
Picture Completion	3.31	3.81	3.43	3.94	3.49	3.99
Coding	3.26	3.77	3.39	3.89	3.44	3.94
Picture Arrangement	3.39	3.91	3.52	4.04	3.58	4.09
Block Design	2.63	3.04	2.72	3.12	2.76	3.16
Object Assembly	3.78	4.37	3.94	4.52	4.00	4.58
Symbol Search			3.52	4.04	3.58	4.09
Mazes					3.94	4.50

*Table 2*

Significance level	Average of 4 Verb. Comp. subtests		Average of 4 Per. Org. subtests	
	0.15	0.05	0.15	0.05
Information	2.24	2.69		
Similarities	2.33	2.79		
Arithmetic				
Vocabulary	2.07	2.48		
Comprehension	2.51	3.01		
Digit Span				
Picture Completion			2.59	3.11
Coding				
Picture Arrangement			2.64	3.17
Block Design			2.22	2.66
Object Assembly			2.88	3.45
Symbol Search				
Mazes				



# 1. Picture Completion



Time limit: 20" each item. Discontinue after 5 consecutive failures. For ages 8-16, reverse sequence of preceding items after failure on either of first two items administered.

# 2. Information

Discontinue after 5 consecutive failures. For ages 8-16, reverse sequence of preceding items after failure on either of first two items administered.

Item	Response	Score 0 or 1
All ages Sample: Pencil		
6-7 1. Fox		
2. Box		
3. Cat		
4. Hand		
8-9 5. Elephant		
6. Man		
10-13 7. Door		
8. Mirror		
9. Clock		
10. Chest of drawers		
14-16 11. Belt		
12. Leaf		
13. Stepladder		
14. Woman's face		
15. Dice		
16. Bath		
17. Light bulb		
18. Whistle		
19. Piano		
20. Scissors		
21. Male profile		
22. Thermometer		
23. Trellis		
24. Orange		
25. Goldfish		
26. Supermarket		
27. Telephone		
28. Umbrella		
29. House		
30. Tennis shoe		

Total subtest score  
(maximum = 30)

Item	Response	Score 0 or 1
6-7 1. Nose		
2. Ears		
3. Legs		
4. Thursday		
8-10 5. Coins		
6. March		
7. Week		
11-13 8. Boil		
9. Seasons		
10. Hours		
14-16 11. Dozen		
12. Stomach		
13. Leap year		
14. Columbus		
15. Oceans		
16. Oxygen		
17. Brazil		
18. Sun		
19. Telephone		
20. Hieroglyphics		
21. Population		
22. Greece		
23. Water		
24. Anne Frank		
25. Glass		
26. Barometer		
27. Rust		
28. London		
29. Darwin		
30. Aluminium		

Total subtest score  
(maximum = 30)

### Picture Completion cautions checklist (see Manual pp. 110-111)

The following cautions should be given, if necessary, but each caution may be given only once during the test.

1. "Yes, but what's missing?"
2. "A part is missing in the picture. What is it that is missing?"
3. "Yes, but what is the most important part that is missing?"



### 3. Coding

Discontinue after 120 seconds.



	Time limit	Comple. time	Total subtest score
6-7 Part A	120"		Max. = 65
8-16 Part B	120"		Max. = 119

Part A							
Score including time-bonus points for perfect performance							
Time in seconds	120-116	115-111	110-106	105-101	100-96	95-86	85-0
Score	59	60	61	62	63	64	65

### 4. Similarities

Discontinue after 4 consecutive failures.

Item	Response	Score
All ages Sample: Red-Blue		Score 0 or 1
*1. Piano-Guitar		
*2. Candle-Lamp		
3. Shirt-Shoe		
4. Wheel-Ball		
5. Milk-Water		
†6. Apple-Banana		Score 0, 1 or 2
7. Cat-Mouse		
8. Elbow-Knee		
9. Anger-Joy		
10. Telephone-Radio		
11. Painting-Statue		
12. Family-Tribe		
13. Ice-Steam		
14. Temperature-Length		
15. Mountain-Lake		
16. Rubber-Paper		
17. First-Last		
‡18. Numbers 9 and 25		
19. Salt-Water		

\* If the child says that they are not alike, fails to respond, or gives an incorrect response, give an example of a 1-point response.

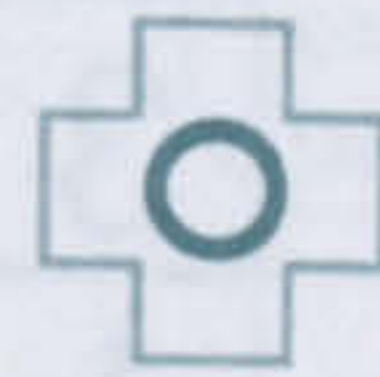
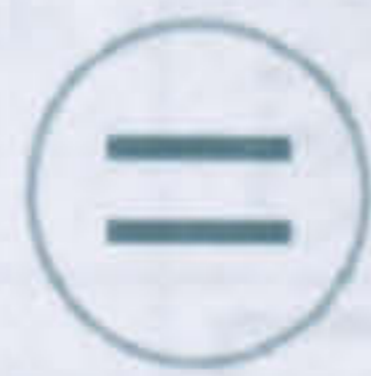
† If the child gives a 1-point response, give an example of a 2-point response.

‡ If the child gives a 1-point response, ask "How else are the numbers 9 and 25 alike?"

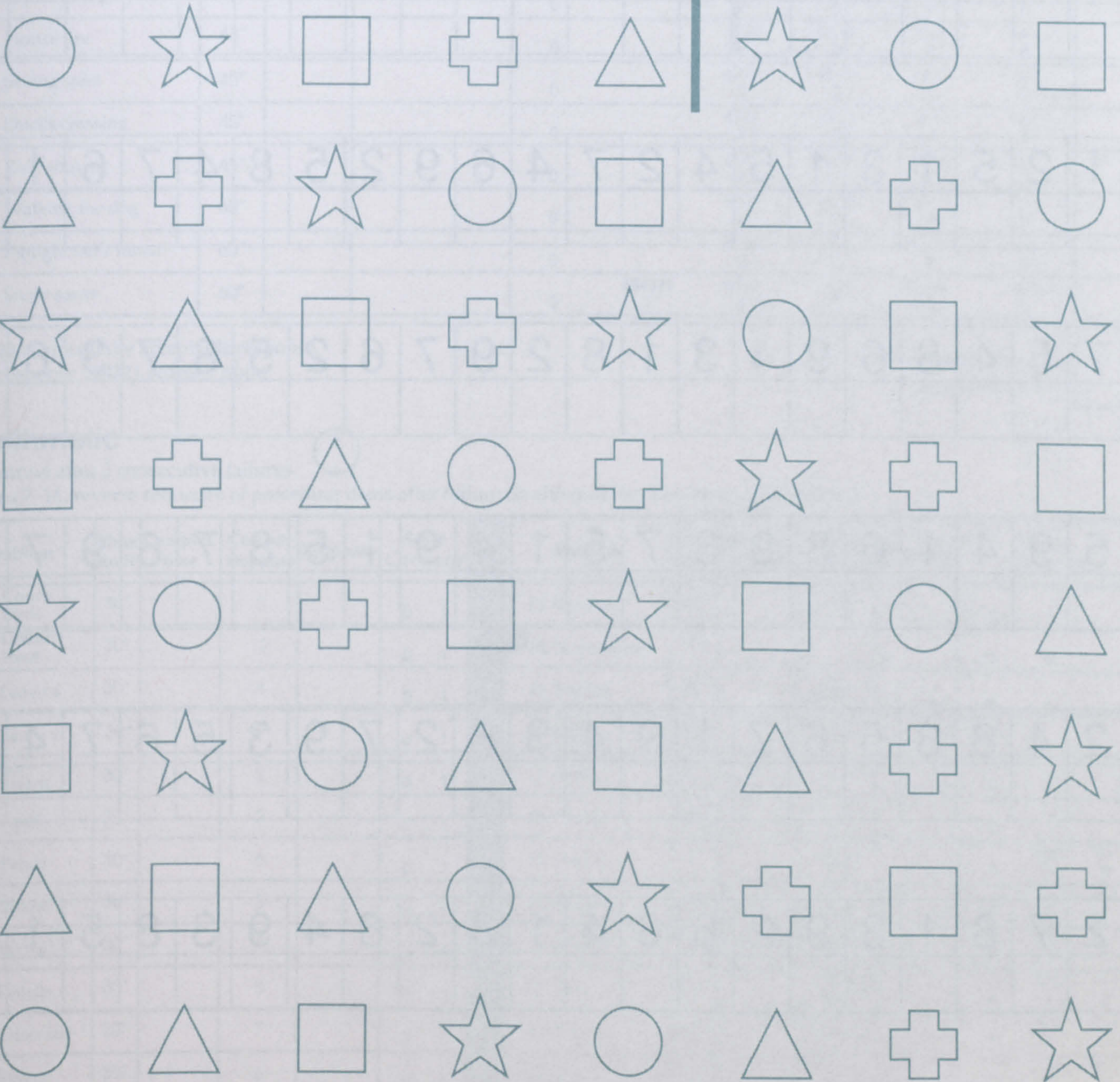
Total subtest score  
(maximum = 33)



A



SAMPLE





**B**

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9
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SAMPLE

2	1	4	6	3	5	2	1	3	4	2	1	3	1	2	3	1	4	2	6	3

1	2	5	1	3	1	5	4	2	7	4	6	9	2	5	8	4	7	6	1	8

7	5	4	8	6	9	4	3	1	8	2	9	7	6	2	5	8	7	3	6	4

5	9	4	1	6	8	9	3	7	5	1	4	9	1	5	8	7	6	9	7	8

2	4	8	3	5	6	7	1	9	4	3	6	2	7	9	3	5	6	7	4	5

2	7	8	1	3	9	2	6	8	4	1	3	2	6	4	9	3	8	5	1	8



## 5. Picture Arrangement



Discontinue after 3 consecutive failures.

Items 1 and 2 are considered failed only if both trials are failed.

For ages 9–16, normal sequence of preceding items after failure on Item 3.

Note: Set out cards in sequence of dot patterns (right-hand corner of card) and record the child's card response order according to card number (left-hand corner).

Item	Time limit	Comple. time	Response order	Score				Score	
				Circle the appropriate score					
All ages Sample: Drinks machine									
6–8 1. Slide	Trial 1	45"			0		2		
	Trial 2	45"			0	1			
2. Picnic	Trial 1	45"			0		2		
	Trial 2	45"			0	1			
9–16 3. River crossing	45"			0		45–16 2	15–11 3	10–6 4	5–1 5
4. Snack time	45"			0		45–21 2	20–16 3	15–11 4	10–1 5
5. Missing the boat	45"			0		45–21 2	20–16 3	15–11 4	10–1 5
6. Hold-up	45"			0		45–21 2	20–16 3	15–11 4	10–1 5
7. Gone fishing	45"			0		45–21 2	20–16 3	15–11 4	10–1 5
8. House fire	45"			0		45–21 2	20–16 3	15–11 4	10–1 5
9. Seeing stars	45"			0		45–21 2	20–16 3	15–11 4	10–1 5
10. Ducks crossing	45"			0		45–21 2	20–16 3	15–11 4	10–1 5
11. Rain shower	45"			0		45–21 2	20–16 3	15–11 4	10–1 5
*12. Walking the dog	60"			0		60–26 2	25–16 3	15–11 4	10–1 5
13. Ploughman's lunch	60"			0		60–26 2	25–16 3	15–11 4	10–1 5
†14. Snow scene	60"			0	654321 1	60–26 2	25–16 3	15–11 4	10–1 5

\* 456123 is an equally acceptable response.

† The response 654321 scores 1 point.

Total subtest score  
(maximum = 64)

## 6. Arithmetic



Discontinue after 3 consecutive failures.

For ages 7–16, reverse sequence of preceding items after failure on either of first two items administered.

Problem	Time limit	Comple. time	Correct response	Response	Score Circle one	Problem	Time limit	Comple. time	Correct response	Response	Score Circle one		
6 1. Count birds	30"		3		0 1	13. Crayons	30"		14		0	1	
2. Count trees	30"		12		0 1	13–16 14. Newspapers	30"		7		0	1	
3. Leave 4	30"		4		0 1	15. T-shirts	30"		£24		0	1	
4. Leave 9	30"		9		0 1	16. Milk	30"		11		0	1	
5. Ice cream	30"		2		0 1	17. Earn	30"		9		0	1	
7–8 6. Apple	30"		2		0 1	18. Dozen	45"		10p		0	1	
7. Pence	30"		6		0 1	19. Money	75"		£8.50		0	75–11 1	10–1 2
8. Cakes	30"		3		0 1	20. Boxes	75"		£40		0	75–11 1	10–1 2
9. Books	30"		4		0 1	21. Bicycle	75"		£42		0	75–11 1	10–1 2
10. Pencils	30"		5		0 1	22. Pens	75"		3/10, 6/20 or 30%		0	75–11 1	10–1 2
11. Chocolate	30"		7		0 1	23. Journey	75"		45 mph		0	75–11 1	10–1 2
9–12 12. Rulers	30"		6		0 1	24. Cars	75"		48		0	75–11 1	10–1 2

Total subtest score  
(maximum = 30)



# 7. Block Design



Discontinue after 2 consecutive failures.

For ages 8-16, normal sequence of preceding items after failure on either trial of Design 3.

Child

Correct design	Time limit	Incorrect design	Comple. time	Correct design	Score				Score
					Circle the appropriate score for each design				
6-7 1.	30"	Trial 1  Trial 2		Y N	0	Trial 1 2	Trial 2 1		
2.	45"	Trial 1  Trial 2		Y N	0	Trial 1 2	Trial 2 1		
8-16 3.	45"	Trial 1  Trial 2		Y N	0	Trial 1 2	Trial 2 1		
4.	45"			Y N	0	45-16 4	15-11 5	10-6 6	5-1 7
5.	45"			Y N	0	45-21 4	20-16 5	15-11 6	10-1 7
6.	75"			Y N	0	75-21 4	20-16 5	15-11 6	10-1 7
7.	75"			Y N	0	75-21 4	20-16 5	15-11 6	10-1 7
8.	75"			Y N	0	75-21 4	20-16 5	15-11 6	10-1 7
9.	75"			Y N	0	75-26 4	25-16 5	15-11 6	10-1 7
10.	120"			Y N	0	120-41 4	40-31 5	30-26 6	25-1 7
11.	120"			Y N	0	120-56 4	55-36 5	35-31 6	30-1 7
12.	120"			Y N	0	120-56 4	55-36 5	35-31 6	30-1 7

Examiner

Total subtest score (maximum = 69)

# 8. Vocabulary

Discontinue after 4 consecutive failures.

For ages 9-16, reverse sequence of preceding items after failure on either of first two items administered.

Item	Response	Score 0, 1 or 2
6-8 1. Clock		
2. Umbrella		
9-10 3. Hat		
4. Thief		
11-13 5. Cow		
6. Bicycle		





## 8. Vocabulary (continued)

Discontinue after 4 consecutive failures.

For ages 9–16, reverse sequence of preceding items after failure on either of first two items administered.

14–16

Item	Response	Score 0, 1 or 2
7. Donkey		
8. Alphabet		
9. Ancient		
10. Leave		
11. Brave		
12. Island		
13. Absorb		
14. Nonsense		
15. Precise		
16. Transparent		
17. Boast		
18. Migrate		
19. Fable		
20. Strenuous		
21. Mimic		
22. Rivalry		
23. Seclude		
24. Unanimous		
25. Amendment		
26. Compel		
27. Imminent		
28. Affliction		
29. Dilatory		
30. Aberration		

Total subtest score  
(maximum = 60)



# 9. Object Assembly

Do not discontinue. Administer *all* items.



(continued)

Object	Time limit	Comple. time	No. of correct junctures	Multiply by	Score										Score	
					Circle the appropriate score for each object											
All ages Sample: Apple																
1. Girl	120"		(0-6)	1	0	1	2	3	4	5	120-26 6	25-16 7	15-1 8			
2. Car	150"		(0-9)	1/2*	0	1	2	3	4	5	150-36 5	35-26 6	25-21 7	20-1 8		
3. Horse	150"		(0-5)	1	0	1	2	3	4	5	150-31 5	30-21 6	20-16 7	15-1 8		
4. Ball	180"		(0-7)	1	0	1	2	3	4	5	6	180-61 7	60-36 8	35-26 9	25-1 10	
5. Face	180"		(0-13)	1/2*	0	1	2	3	4	5	6	180-81 7	80-56 8	55-41 9	40-1 10	

\* Round half scores upwards.

Total subtest score  
(maximum = 44)

# 10. Comprehension

Discontinue after 3 consecutive failures.

Item	Response	Score 0, 1 or 2
*1. Cut finger		
2. Find wallet		
3. Seat-belts		
†4. Smoke		
5. Lose ball		
6. Telephone book		
7. Fight		

\* If the child does not give a 2-point response, illustrate with a few 2-point answers.

† If the child's response reflects only one general idea, ask for a second response.





# 10. Comprehension (continued)

Item	Response	Score 0, 1 or 2
†18. Lights		
†19. Rules		
10. Inspect meat		
†11. Number plates		
12. Stamps		
13. Promise		
†14. Newspaper		
15. Secret ballot		
†16. Paperback books		
†17. MPs (TDs)		
†18. Freedom of speech		

† If the child's response reflects only one general idea, ask for a second response.

Total subtest score  
(maximum = 36)



# 11. Symbol Search

Discontinue after 120 seconds.



	6-7 Part A	8-16 Part B
Time limit	120"	120"
Compleat. time		
Number correct		
Number incorrect		

Max. = 45    Max. = 45

Total subtest score

(Total score = number correct minus number incorrect)

# 12. Digit Span

For both Digits Forward and Digits Backward, administer both trials of each item even if Trial 1 is passed.

Discontinue after failure of both trials of any item.

Administer Digits Backward even if Digits Forward score is 0.

All ages		Digits Forward	Trial score	Trial 2/Response	Trial score	Item score 0,1 or 2
		Trial 1/Response				
1	2-9			4-6		
2	3-8-6			6-1-2		
3	3-4-1-7			6-1-5-8		
4	8-4-2-3-9			5-2-1-8-6		
5	3-8-9-1-7-4			7-9-6-4-8-3		
6	5-1-7-4-2-3-8			9-8-5-2-1-6-3		
7	1-6-4-5-9-7-6-3			2-9-7-6-3-1-5-4		
8	5-3-8-7-1-2-4-6-9			4-2-6-9-1-7-8-3-5		

Digits Forward score (maximum = 16)

All ages		Digits Backward	Trial score	Trial 2/Response	Trial score	Item score 0,1 or 2
		Trial 1/Response				
	Sample 8-2			Sample 5-6		
1	2-5			6-3		
2	5-7-4			2-5-9		
3	7-2-9-6			8-4-9-3		
4	4-1-3-5-7			9-7-8-5-2		
5	1-6-5-2-9-8			3-6-7-1-9-4		
6	8-5-9-2-3-4-2			4-5-7-9-2-8-1		
7	6-9-1-6-3-2-5-8			3-1-7-9-5-4-8-2		

Digits Backward score (maximum = 14)

Total subtest score (maximum = 30)

# 13. Mazes



Discontinue after 2 consecutive failures.

For ages 8-16, normal sequence of Mazes 1-3 after partial credit on Maze 4; normal sequence of Sample and Mazes 1-3 after failure on Maze 4.

Maze	Time limit	Compleat. time	Number of errors	Score				Score	
				Circle the appropriate score for each maze					
6-7 Sample									
1	30"			2+ errors 0	1 error 1	0 errors 2			
2	30"			2+ errors 0	1 error 1	0 errors 2			
3	30"			2+ errors 0	1 error 1	0 errors 2			
8-16 4	30"			2+ errors 0	1 error 1	0 errors 2			
5	45"			2+ errors 0	1 error 1	0 errors 2			
6	60"			2+ errors 0	1 error 1	0 errors 2			
7	120"			3+ errors 0	2 errors 1	1 error 2	0 errors 3		
8	120"			4+ errors 0	3 errors 1	2 errors 2	1 error 3	0 errors 4	
9	150"			4+ errors 0	3 errors 1	2 errors 2	1 error 3	0 errors 4	
10	150"			5+ errors 0	4 error 1	3 errors 2	2 errors 3	1 error 4	0 errors 5

### Mazes cautions checklist (see WISC-III<sup>UK</sup> Manual p. 212)

The following cautions should be given, if necessary, but each caution may be given only once during the test.

- "You're not allowed to go through a wall."
- "Don't stop. Keep going until you find your way out."
- "You're not allowed to start again. Keep going from here (point to the last place reached) and try to find the right way out."
- "You should start here" (point to the centre box).
- "You must get right out."

Total subtest score (maximum = 28)

Name ..... Date .....

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**WISC-III<sup>UK</sup>**

Wechsler Intelligence Scale for Children Third Edition UK







# Basic Reading



About 10 seconds for each item



If the child scores 0 on any of the first 5 items administered, administer preceding items in reverse sequence until child scores 1 on each of 5 consecutive items



6 consecutive scores of 0

Item	Notes	Score 0 or 1
<b>5-7</b> 1. fun ask <b>sit</b> girl		
2. park next for <b>card</b>		
3. <b>duck</b> but did can		
4. stop <b>push</b> box walk		
5. call <b>cow</b> could come		
6. has had <b>hat</b> hot		
7. <b>sheep</b> shop sleep street		

Item	Notes	Score 0 or 1
<b>8-9</b> 8. the		
9. up		
10. into		
11. so		
12. said		
13. then		
14. animal		
15. because		

Item	Notes	Score 0 or 1
<b>10+</b> 16. slow		
17. again		
18. any		
19. fruit		
20. know		
21. shut		
22. instead		
23. enough		
24. sight		
25. photograph		
26. completely		

Item	Notes	Score 0 or 1
27. courage		
28. comforting		
29. jealous		
30. responsibility		
31. dozing		
32. ajar		
33. ruin		
34. useless		
35. pier		
36. ideally		
37. chord		
38. acquire		
39. governmental		
40. abrupt		
41. pathetic		
42. cleanse		
43. unique		
44. sparse		
45. accordion		
46. poise		
47. ridicule		
48. indomitable		
49. catastrophe		
50. conscience		
51. reminisce		
52. coerce		
53. euphemism		
54. antithesis		
55. hierarchical		

Child's behaviour when presented with unfamiliar words (tick where applicable)

- |                                 |       |                               |       |
|---------------------------------|-------|-------------------------------|-------|
| A. Used decoding skills         | ..... | D. Used no strategy (guessed) | ..... |
| B. Was persistent when decoding | ..... | E. Made no attempt            | ..... |
| C. Gave up easily when decoding | ..... |                               |       |

RAW SCORE

Max =



# Spelling



Items 1-6: About 10 seconds to begin writing and as much time as needed to complete the response  
 Items 7-50: About 15 seconds



If the child scores 0 on any of the first 5 items administered, administer preceding items in reverse sequence until child scores 1 on each of 5 consecutive items



6 consecutive scores of 0

Item	Notes	Reg.	Irreg.	Hom.	Score 0 or 1
5-6 1.	What will probably happen next?				
2.					
3.					
4.					
5.					
6.	How can you get your body to burn while you sleep?				

Item	Notes	Reg.	Irreg.	Hom.	Score 0 or 1
7-9 7.					
8.					
9.					
10.					
11.	What makes one flute sound different from another?				
12.					
13.					
14.					
15.					

Item	Notes	Reg.	Irreg.	Hom.	Score 0 or 1
10-12 16.	Why was the warden sleeping when the plane ran?				
17.					
18.					
19.					
20.					

Item	Notes	Reg.	Irreg.	Hom.	Score 0 or 1
13+ 21.	What is likely to happen to the lens?				
22.					
23.	Why have efforts to stop dumping been unsuccessful?				
24.					
25.					

Item	Notes	Reg.	Irreg.	Hom.	Score 0 or 1
26.					
27.					
28.					
29.					
30.					
31.					
32.					
33.					
34.					
35.					
36.					
37.					
38.					
39.					
40.					
41.					
42.					
43.					
44.					
45.					
46.					
47.					
48.					
49.					
50.					

Max=50

RAW  
SCORE



# Reading Comprehension



About 15 seconds  
for each item



If the child scores 0 on any of the first 5 items administered,  
administer preceding items in reverse sequence until child  
scores 1 on each of 5 consecutive items



4 consecutive  
scores of 0

Item	Response	Score 0 or 1
<b>5-8</b> 1. What does the bird do?		
2. Why is the girl sad?		
3. What do the people want to do?		
4. What does the girl want to do?		
5. Why was the dog running?		
6. Whose book did the cat sit on?		
7. When did the lion laugh?		
8. What is in the box?		
<b>9-10</b> 9. What did Lee see first?		
10. What animal is this story about?		
11. Why did the milk fall down?		
<b>11+</b> 12. What animal is this story about?		
13. What makes this boat different?		
14. Why did Mr Clark want a second job?		
15. Which dog has the same name as a cat?		
16. What will probably happen at the next game?		
17. What in the popcorn makes it pop?		



# Reading Comprehension



About 15 seconds  
for each item



If the child scores 0 on any of the first 5 items administered,  
administer preceding items in reverse sequence until child  
scores 1 on each of 5 consecutive items



4 consecutive  
scores of 0

Item	Response	Score 0 or 1
18. What will probably happen next?		
19. What do the Mexican Indian women do to their hair that men do not?		
20. How can you get your body to burn fat while you sleep?		
21. Why are tigers rarely studied in the wild?		
22. What makes one flute sound different from another?		
23. Why should you be prepared before you begin assembling the model?		
24. Why was the warden sleeping when the phone rang?		
25. How did cardamom come to Europe?		
26. What is likely to happen to the lemurs?		
27. Why have efforts to stop dumping been unsuccessful?		
28. Before sulphur is heated with rubber, what is done to make the rubber stronger?		



# Reading Comprehension



About 15 seconds •  
for each item



If the child scores 0 on any of the first 5 items administered,  
administer preceding items in reverse sequence until child  
scores 1 on each of 5 consecutive items



4 consecutive  
scores of 0

Item	Response	Score 0 or 1
29. What is likely to happen when prices decrease?		
30. How are mammals and saurians different?		
31. According to the passage, what happens before cloth is made?		
32. What is the most likely reason for the changes in the prices of peaches during the year?		
33. Why is Jellinek's disease receiving more attention?		
34. When are you most likely to remember a dream?		
35. How was the innocence of the accused established?		
36. Why is Hawaii the only state in America to produce coffee commercially?		
37. What word or phrase in this sentence is a trope?		
38. Explain why a string of beads and a rubber band are examples of concatenation or synthesis.		

Max=38

**RAW  
SCORE**



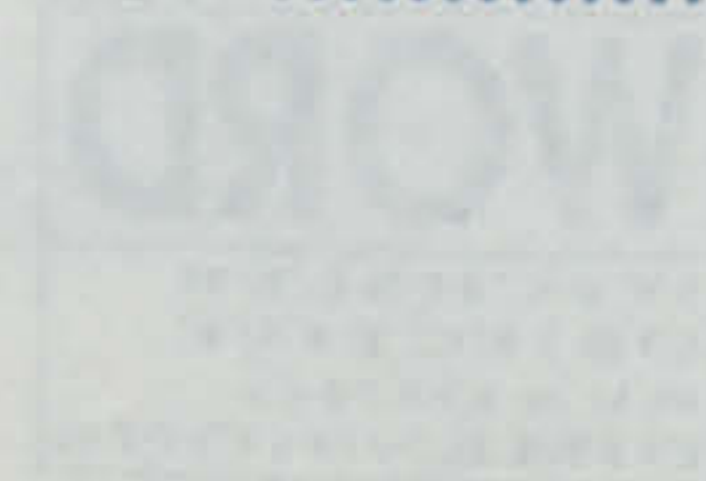
# Spelling

Spelling

Name .....

Participant No: \_\_\_\_\_

1. ....
2. ....
3. ....
4. ....
5. ....
6. ....
7. ....
8. ....
9. ....
10. ....
11. ....
12. ....
13. ....
14. ....
15. ....
16. ....
17. ....
18. ....
19. ....
20. ....
21. ....
22. ....
23. ....
24. ....
25. ....
26. ....





# Spelling

Continued



4 consecutive items of 10

Item	Response	Score
27. ....	.....	0
28. ....	.....	1
29. ....	.....	1
30. ....	.....	1
31. ....	.....	1
32. ....	.....	1
33. ....	.....	1
34. ....	.....	1
35. ....	.....	1
36. ....	.....	1
37. ....	.....	1
38. ....	.....	1
39. ....	.....	1
40. ....	.....	1
41. ....	.....	1
42. ....	.....	1
43. ....	.....	1
44. ....	.....	1
45. ....	.....	1
46. ....	.....	1
47. ....	.....	1
48. ....	.....	1
49. ....	.....	1
50. ....	.....	1



## SELF – REPORT SCHEDULE

---

Participant No:

---

1. What are your favourite subjects or activities at school?
  2. What kind of topics or activities are you good at?
  3. What do you most dislike about school and why?
  4. What do you do if you are worried or have a problem at school?
  5. What makes you most worried or scared at school?
  6. What do you do at lunch and break-times?
  7. Which people do you like in school and why?
  8. Which people do you not like in school and why?
  9. What helps you to learn best?
  10. When or what do you find it hard to learn?
  11. What things would you like to change in school and why?
-

---

**RESPONSE SHEET**

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

---

**Please circle the comment below that best describes your feelings towards school.**

**I dislike school a lot**

**I dislike school**

**I quite like school**

**I like school a lot**

**1**

**2**

**3**

**4**



## SITUATION CARD TEST - SCHOOL

1. Pretend to be the teacher. One of the class is talking when you are. Ask them to listen.

Answer \_\_\_\_\_

2. Your friend just beat you in a close race. What do you say to your friend?

Answer \_\_\_\_\_

3. You have left a book in the cloakroom and need to fetch it. What will you say to get permission?

Answer \_\_\_\_\_

4. Pretend to be the teacher. One of the class keeps forgetting to bring money. What can you say?

Answer \_\_\_\_\_

5. Some friend's ask you to join in with their game. You want to join in but don't know how to play it. What can you say or do?

Answer \_\_\_\_\_

6. It's break time and your friend tells you that he saw a great film at the weekend. What can you ask to find out more about it?

Answer \_\_\_\_\_

7. A group of your friends are playing a maths game. You would like to join in. What could you say to them?

Answer \_\_\_\_\_

8. Everyone has been asked to talk about something that happened over the holidays. Briefly describe something that happened to you.

Answer \_\_\_\_\_

9. Someone teases you about your clothes. What can you say or do?

Answer \_\_\_\_\_

10. You are playing football and accidentally kick a ball into someone's face. Apologise.

Answer \_\_\_\_\_



11. Your friend is working, but you want to get their attention so you can show them your story. How can you do this?

Answer \_\_\_\_\_

12. Your friend has done a fantastic painting. Compliment them on it.

Answer \_\_\_\_\_

13. A new pupil has joined your class. Introduce yourself to them.

Answer \_\_\_\_\_

14. Ask your friend if they would like to come to your house after school.

Answer \_\_\_\_\_

15. It's break time and you are on your own. You can see a group from your class playing a game. Ask if you can join in.

Answer \_\_\_\_\_

16. It's sports day and your team lost the relay race because your friend fell over. What can you say to your friend?

Answer \_\_\_\_\_

17. You would like a turn on the computer but someone else is using it. What can you say to them?

Answer \_\_\_\_\_

18. It's a drama lesson and you have to find a partner to work with. How will you do this?

Answer \_\_\_\_\_

19. You were late for school because you fell off your bike. Explain this to your teacher.

Answer \_\_\_\_\_

20. Your friend is sitting by herself, looking very sad. Find out what is wrong.

Answer \_\_\_\_\_

21. You are lining up and someone pushes in front of you. What can you say or do?

Answer \_\_\_\_\_

22. It's the middle of a lesson and you suddenly feel sick. What can you say to the teacher?

Answer \_\_\_\_\_



23. A visitor asks you where the school office is. Give them directions.

Answer \_\_\_\_\_

24. The teacher has just given the class some important instructions but you don't understand them. What can you say or do?

Answer \_\_\_\_\_

25. You need to ask the teacher for help but he is talking to another teacher. What can you say?

Answer \_\_\_\_\_

## SITUATION CARD TEST – HOME

1. Your sister or brother is upset because her / his swimming team lost in the finals. What could you say or do?

Answer \_\_\_\_\_

2. There is an important phone call for your mum or dad when he or she is taking a nap. What will you do?

Answer \_\_\_\_\_

3. Pretend to be mum or dad. Your son was disappointed because he didn't get into the school football team. What can you say or do?

Answer \_\_\_\_\_

4. It's your birthday. Your friend gives you a present that you do not like. What will you say or do?

Answer \_\_\_\_\_

5. Your brother or sister is watching TV and you want to watch a programme on the other channel. What could you say or do?

Answer \_\_\_\_\_



6. You want to watch TV but your dad is reading the newspaper. What could you say?

Answer \_\_\_\_\_

7. Your mum or dad is ill in bed. Ask if there is anything you can do to help.

Answer \_\_\_\_\_

8. Your brother or sister keeps calling you names. What will you say or do?

Answer \_\_\_\_\_

9. You have been talking to your granddad on the phone for some time and now you need to go and do some homework. What will you say to finish the phone call?

Answer \_\_\_\_\_

10. Your brother has accidentally damaged one of your birthday presents. What will you say or do?

Answer \_\_\_\_\_

11. Ask your sister or brother if you can borrow his or her computer CD to take to school.

Answer \_\_\_\_\_

12. You have answered the telephone but did not understand what the person said. What can you say to them?

Answer \_\_\_\_\_

13. Your friend comes to your house while your cousin is staying with you. Introduce your cousin to your friend.

Answer \_\_\_\_\_

14. You are trying to do some homework but your sister or brother is playing music too loudly. What could you say to him or her?

Answer \_\_\_\_\_

15. You have discovered a fire in the kitchen. Make a phone call to the emergency services. What will you say?

Answer \_\_\_\_\_

16. Tell your mum or dad something that happened at school today.

Answer \_\_\_\_\_

17. Your mum or dad is on the telephone. You need to give him or her an urgent message. How will you interrupt?

Answer \_\_\_\_\_



18. Your mum or dad is talking to their friend and you need his / her attention. How will you get it?

Answer \_\_\_\_\_

19. Someone phones for your mum or dad but she / he is not at home. Take a message

Answer \_\_\_\_\_

20. Your mum or dad has cooked a delicious meal. Tell him or her how good it is.

Give reasons \_\_\_\_\_

21. Ask your mum or dad if you can have a friend to come and stay the night.

Answer \_\_\_\_\_

22. Ask your sister if she will take you shopping.

Answer \_\_\_\_\_

23. Pretend to be your dad or mum. Your daughter wants to watch a TV programme that is not suitable. What will you say?

Answer \_\_\_\_\_

24. You know the teacher asked you to take something to school tomorrow, but you have forgotten what it was. Phone a friend to find out.

Answer \_\_\_\_\_

25. Pretend to be a mum. Your daughter has talked rudely to you. What do you say or do?

Answer \_\_\_\_\_



## SITUATION CARD TEST – OUT AND ABOUT

1. You have been at a friend's birthday party and it is now time to leave. What will you say to them as you go?

Answer \_\_\_\_\_

2. You are in a café. You can only see tea and coffee on the menu. Ask the waiter what other types of drinks they have.

Answer \_\_\_\_\_

3. You had arranged to meet your friend in town but they didn't turn up. Phone them to find out why.

Answer \_\_\_\_\_

4. Someone in your class at school has invited you to go to their house after school, but you don't really want to go. What can you say?

Answer \_\_\_\_\_

5. You are at your friend's house and it has started to rain heavily. Ask if you can phone your mum or dad to see if he or she can give you a lift home.

Answer \_\_\_\_\_

6. You phone your friend Tom to ask if he can come to your house tomorrow. You get the answer-phone. Leave a message

Answer \_\_\_\_\_

7. You are at the cinema with your friend. Ask for two tickets.

Answer \_\_\_\_\_

8. You are at a fast food café. Order a burger and chips.

Answer \_\_\_\_\_

9. You are having lunch at your aunt and uncle's house. They have given you fish, but fish makes you ill. What can you say or do?

Answer \_\_\_\_\_

10. You are at your grand-parents house. You are very thirsty. Ask for a drink.

Answer \_\_\_\_\_

11. Your friend has been knocked off his bike. You think he may have a broken leg. Make a phone call to the emergency service. What will you need?

Answer \_\_\_\_\_

12. You are clothes shopping with your mum. You want the trendy trainers but you do not have enough money. Ask your mum if you can borrow some money.

Answer \_\_\_\_\_



13. You have been playing tennis with your friend. You have won the match. What do you say to your friend?

Answer \_\_\_\_\_

14. You are in a clothes shop and have found a tee shirt you like. Ask the shop assistant if you can try it on.

Answer \_\_\_\_\_

15. You are visiting your gran or aunt. She is upset because her cat died. What can you say or do to comfort her?

Answer \_\_\_\_\_

16. You are at your cousin's house. You'd like to borrow one of their CD's. Ask if you can.

Answer \_\_\_\_\_

17. You have had an argument with your friend. What can you say to make up with him or her?

Answer \_\_\_\_\_

18. You are in a sports shop. You see a football you would like. Find out the price.

Answer \_\_\_\_\_

19. You have arranged to meet your friend in town but arrive late. Apologise and explain.

Answer \_\_\_\_\_

20. You have just bought a bar of chocolate but the shop assistant has given you the wrong change. What can you say?

Answer \_\_\_\_\_

21. You are at a friend's house. You are bored with the game you are playing. What can you say or do?

Answer \_\_\_\_\_

22. You are not allowed to go round to your friend's house today. Explain this to your friend.

Answer \_\_\_\_\_

23. You are in a CD shop. A salesperson asks, "May I help you?" What do you reply?

Answer \_\_\_\_\_

24. You've dropped a glass of lemonade on the floor at your friend's house. What do you say to your friend?

Answer \_\_\_\_\_



25. You are buying an ice-cream. The ice-cream vendor has told you the flavours but you can't remember them all. Ask again.

Answer \_\_\_\_\_

## SITUATION CARD TEST – SOCIALLY SPEAKING

1. Why is it important to smile and say hello before you start a conversation?

Answer \_\_\_\_\_

2. Suggest two ways to start a conversation

Answer \_\_\_\_\_

3. Imagine you are feeling sad. Suggest two things you could do to cheer yourself up.

Answer \_\_\_\_\_

4. Imagine you have lost your pocket money. How would you feel and why?

Answer \_\_\_\_\_

5. Suggest one way you could end a conversation.

Answer \_\_\_\_\_



6. Finish the sentence. My teacher is happy when.....

Answer \_\_\_\_\_

7. Finish the sentence. My mum is sad when.....

Answer \_\_\_\_\_

8. Someone says to you, "I had a great weekend." Suggest two questions you could ask them.

Answer \_\_\_\_\_

9. Describe two things that a good listener does.

Answer \_\_\_\_\_

10. Name a feeling you have had today. What situation caused that feeling?

Answer \_\_\_\_\_

11. Suggest one place where it is good to have a conversation and one place where it is not good.

Answer \_\_\_\_\_

12. Suggest one thing you can say or do to show you have been listening.

Answer \_\_\_\_\_

13. Imagine you are angry. Suggest two things you can do to help yourself "cool off".

Answer \_\_\_\_\_

14. If you have made another person sad, what should you do?

Answer \_\_\_\_\_

15. Imagine you have been told off. How would you feel and why?

Answer \_\_\_\_\_

16. Imagine you are being teased. What can you do?

Answer \_\_\_\_\_

17. Suggest one person you could talk to if you were upset.

Answer \_\_\_\_\_

18. Suggest two things you can do that would make your mum or dad happy.

Answer \_\_\_\_\_



19. Imagine you have won a prize. How would you feel and why?

Answer \_\_\_\_\_

20. Why is it better to make eye contact when talking to another person?

Answer \_\_\_\_\_

21. Why is it better to face someone when you are speaking to them?

Answer \_\_\_\_\_

22. Why should you not sit too close when you are speaking to someone?

Answer \_\_\_\_\_

23. Why should you not sit too far away from someone when speaking to them?

Answer \_\_\_\_\_

24. What makes your friend excited?

Answer \_\_\_\_\_

25. What makes your friend upset?

Answer \_\_\_\_\_

## **APPENDIX FIVE**

**1. DATA SET**

**2. STATISTICAL DATA**



## DATA SET

**Group A**                      **Baseline**                      **Experimental Group**

Participant 1

Monday-Thursday

Week 6

V.E.1	V.C.1	N.V.C.1	E.C.1	PL.1	A.t.C.1	P.I.1	L.S.1
1	1	1	1	0	0	0	0
1	0	1	1	1	1	0	1
2	2	0	1	1	1	1	2
1	2	1	1	0	1	1	2
<b>5</b>	<b>5</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>5</b>

Participant 2

Monday-Thursday

Week 6

V.E.1	V.C.1	N.V.C.1	E.C.1	PL.1	A.t.C.1	P.I.1	L.S.1
0	2	0	1	1	1	0	1
2	0	1	2	1	0	1	1
1	1	1	2	1	1	1	1
1	2	1	2	1	1	2	1
<b>4</b>	<b>5</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>4</b>	<b>4</b>

Participant 3

Monday-Thursday

Week 6

V.E.1	V.C.1	N.V.C.1	E.C.	PL.1	A.t.C.1	P.I.1	L.S.1
2	2	1	2	0	1	0	0
2	1	1	1	1	1	1	2
1	2	1	1	1	1	1	1
2	1	1	1	1	1	1	1
<b>7</b>	<b>6</b>	<b>4</b>	<b>5</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>4</b>

Participant 4

Monday-Thursday

Week 6

V.E.1	V.C.1	N.V.C.1	E.C.1	PL.1	A.t.C.1	P.I.1	L.S.1
0	1	1	1	0	0	0	2
1	2	1	2	2	1	1	1
1	2	0	2	1	1	1	1
1	2	1	1	1	2	1	2
<b>3</b>	<b>7</b>	<b>3</b>	<b>6</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>6</b>

## Participant 5

## Monday-Thursday

## Week 6

V.E.1	V.C.1	N.V.C.1	E.C.1	PL.1	A.t.C.1	P.I.1	L.S.1
2	1	1	1	0	0	0	0
0	1	1	1	2	1	1	1
2	2	0	1	1	1	1	1
2	2	1	2	2	1	1	1
<b>6</b>	<b>6</b>	<b>3</b>	<b>5</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>3</b>

## Participant 6

## Monday-Thursday

## Week 6

V.E.1	V.C.1	N.V.C.1	E.C.1	PL.1	A.t.C.1	P.I.1	L.S.1
1	0	0	1	0	0	0	0
1	0	0	1	1	1	0	0
1	2	1	2	1	0	1	1
2	2	1	1	1	1	1	1
<b>5</b>	<b>4</b>	<b>2</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>

## Participants 1 - 6

## Total Scores

## Week 6

Participant	V.E.1	V.C.1	N.V.C.1	E.C.1	PL.1	A.t.C.1	P.I.1	L.S.1
1	5	5	3	4	2	3	2	5
2	4	5	3	4	4	3	4	4
3	7	6	4	5	3	4	3	4
4	3	7	3	6	4	4	3	6
5	6	6	3	5	5	3	3	3
6	5	4	2	5	3	2	2	2
<b>Total</b>	<b>30</b>	<b>33</b>	<b>18</b>	<b>29</b>	<b>21</b>	<b>19</b>	<b>17</b>	<b>24</b>



**Group B****Baseline****Control Group**

Participant 7

Monday-Thursday

Week 6

V.E.1	V.C.1	N.V.C.1	E.C.1	PL.1	A.t.C.1	P.I.1	L.S.1
1	0	1	0	0	1	0	0
1	1	1	1	1	0	1	1
0	2	0	1	1	1	2	2
1	2	1	1	1	1	1	2
<b>3</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>5</b>

Participant 8

Monday-Thursday

Week 6

V.E.1	V.C.1	N.V.C.1	E.C.1	PL.1	A.t.C.1	P.I.1	L.S.1
0	2	0	1	1	1	0	1
0	0	1	2	0	1	0	1
1	1	1	2	1	1	1	1
1	2	1	1	1	1	2	1
<b>2</b>	<b>5</b>	<b>3</b>	<b>6</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>4</b>

Participant 9

Monday-Thursday

Week 6

V.E.1	V.C.1	N.V.C.1	E.C.	PL.1	A.t.C.1	P.I.1	L.S.1
0	2	0	1	0	1	0	2
1	0	0	1	1	0	1	2
1	1	0	1	1	1	1	0
2	1	1	1	2	1	0	2
<b>4</b>	<b>4</b>	<b>1</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>6</b>

Participant 10

Monday-Thursday

Week 6

V.E.1	V.C.1	N.V.C.1	E.C.1	PL.1	A.t.C.1	P.I.1	L.S.1
1	1	0	0	0	0	0	0
1	2	1	2	2	0	1	0
1	2	0	2	1	1	2	0
1	2	1	1	1	2	1	2
<b>4</b>	<b>7</b>	<b>2</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>4</b>	<b>2</b>

Participant 11

Monday-Thursday

Week 6

V.E.1	V.C.1	N.V.C.1	E.C.1	PL.1	A.t.C.1	P.I.1	L.S.1
0	1	1	1	0	0	0	0
1	1	1	1	0	1	1	1
2	2	2	1	1	1	1	1
2	2	1	2	2	1	1	1
<b>5</b>	<b>6</b>	<b>5</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

Participant 12

Monday-Thursday

Week 6

V.E.1	V.C.1	N.V.C.1	E.C.1	PL.1	A.t.C.1	P.I.1	L.S.1
1	0	0	1	0	1	0	2
2	2	2	1	0	1	1	0
1	2	1	1	1	0	1	1
2	2	1	1	1	1	1	1
<b>6</b>	<b>6</b>	<b>4</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>4</b>

Participants 7 - 12

Total Scores

Week 6

Participant	V.E.1	V.C.1	N.V.C.1	E.C.1	PL.1	A.t.C.1	P.I.1	L.S.1
7	3	5	3	3	3	3	4	5
8	2	5	3	6	3	4	3	4
9	4	4	1	4	4	3	2	6
10	4	7	2	5	4	3	4	2
11	5	6	5	5	3	3	3	3
12	6	6	4	4	2	3	3	4
<b>Total</b>	<b>24</b>	<b>33</b>	<b>18</b>	<b>27</b>	<b>19</b>	<b>19</b>	<b>19</b>	<b>24</b>



**Group A****Intervention****Experimental Group**

Participant 1

Monday -Thursday

Week 26

V.E.2	V.C.2	N.V.C.2	E.C.2	PL.2	A.t.C.2	P.I.2	L.S.2
2	1	1	1	0	0	1	2
2	2	1	1	1	1	2	2
2	2	2	3	2	2	2	2
3	2	3	2	2	2	1	2
<b>9</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>5</b>	<b>5</b>	<b>6</b>	<b>7</b>

Participant 2

Monday-Thursday

Week 26

V.E.2	V.C.2	N.V.C.2	E.C.2	PL.2	A.t.C.2	P.I.2	L.S.2
1	2	2	2	2	0	1	2
1	2	2	2	1	1	1	1
2	2	1	2	1	2	2	2
3	2	2	1	1	2	2	3
<b>7</b>	<b>8</b>	<b>7</b>	<b>7</b>	<b>5</b>	<b>5</b>	<b>6</b>	<b>8</b>

Participant 3

Monday-Thursday

Week 26

V.E.2	V.C.2	N.V.C.2	E.C.2	PL.2	A.t.C.2	P.I.2	L.S.2
1	1	1	1	0	1	0	1
3	2	0	2	1	1	1	2
3	2	2	2	2	2	2	2
3	3	3	2	2	3	3	2
<b>10</b>	<b>8</b>	<b>6</b>	<b>7</b>	<b>5</b>	<b>7</b>	<b>6</b>	<b>7</b>

Participant 4

Monday-Thursday

Week 26

V.E.2	V.C.2	N.V.C.2	E.C.2	PL.2	A.t.C.2	P.I.2	L.S.2
1	0	2	2	0	0	1	3
2	3	2	3	2	1	1	3
2	3	2	3	2	2	2	2
2	3	2	2	3	3	3	2
<b>7</b>	<b>9</b>	<b>8</b>	<b>10</b>	<b>7</b>	<b>6</b>	<b>7</b>	<b>10</b>

Participant 5

Monday-Thursday

Week 26

V.E.2	V.C.2	N.V.C.2	E.C.2	PL.2	A.t.C.2	P.I.2	L.S.2
1	1	0	0	1	1	0	1
3	2	1	0	2	1	1	1
2	3	2	3	2	1	1	2
3	3	1	3	3	2	2	2
<b>9</b>	<b>9</b>	<b>4</b>	<b>6</b>	<b>8</b>	<b>5</b>	<b>4</b>	<b>6</b>

Participant 6

Monday-Thursday

Week 26

V.E.2	V.C.2	N.V.C.2	E.C.2	PL.2	A.t.C.2	P.I.2	L.S.2
1	1	0	1	1	1	1	1
2	2	1	2	1	1	1	1
1	2	2	3	1	2	1	2
4	2	2	2	2	2	2	1
<b>8</b>	<b>7</b>	<b>5</b>	<b>8</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>5</b>

Participants 1 - 6

Total Scores

Week 26

Participant	V.E.2	V.C.2	N.V.C.2	E.C.2	PL.2	A.t.C.2	P.I.2	L.S.2
1	9	7	7	7	5	5	6	8
2	7	8	7	7	5	5	6	8
3	10	8	6	7	5	7	6	7
4	7	9	8	10	7	6	7	10
5	9	9	4	6	8	5	4	6
6	8	7	5	8	5	6	5	5
<b>Total</b>	<b>50</b>	<b>48</b>	<b>37</b>	<b>45</b>	<b>35</b>	<b>34</b>	<b>34</b>	<b>44</b>



**Group B****Extended Baseline****Control Group**

Participant 7

Monday -Thursday

Week 25

V.E.2	V.C.2	N.V.C.2	E.C.2	PL.2	A.t.C.2	P.I.2	L.S.2
0	1	0	0	1	1	0	1
1	1	1	1	0	0	1	1
1	1	0	1	1	1	1	1
2	2	1	1	1	1	1	1
<b>4</b>	<b>5</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>4</b>

Participant 8

Monday-Thursday

Week 25

V.E.2	V.C.2	N.V.C.2	E.C.2	PL.2	A.t.C.2	P.I.2	L.S.2
0	2	1	1	0	1	0	1
1	1	1	1	1	1	0	0
1	1	0	2	1	1	1	2
1	1	1	2	1	1	1	2
<b>3</b>	<b>5</b>	<b>3</b>	<b>6</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>5</b>

Participant 9

Monday-Thursday

Week 25

V.E.2	V.C.2	N.V.C.2	E.C.2	PL.2	A.t.C.2	P.I.2	L.S.2
1	1	1	0	0	1	0	1
1	1	1	0	1	1	1	1
1	1	0	2	1	1	1	1
2	1	1	2	2	0	1	2
<b>5</b>	<b>4</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>5</b>

Participant 10

Monday-Thursday

Week 25

V.E.2	V.C.2	N.V.C.2	E.C.2	PL.2	A.t.C.2	P.I.2	L.S.2
0	1	0	0	0	0	0	0
2	1	1	1	1	1	1	1
0	2	2	2	1	1	1	0
2	2	1	2	2	1	1	1
<b>4</b>	<b>6</b>	<b>4</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>2</b>

Participant 11

Monday-Thursday

Week 25

V.E.2	V.C.2	N.V.C.2	E.C.2	PL.2	A.t.C.2	P.I.2	L.S.2
1	1	1	2	1	0	0	0
1	1	1	0	1	1	1	0
2	2	0	2	1	1	1	1
2	1	2	1	0	1	1	1
<b>6</b>	<b>5</b>	<b>4</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>

Participant 12

Monday-Thursday

Week 25

V.E.2	V.C.2	N.V.C.2	E.C.2	PL.2	A.t.C.2	P.I.2	L.S.2
0	1	1	0	0	0	0	0
1	1	0	2	0	1	1	1
2	2	1	0	1	1	1	0
2	2	1	2	1	1	2	2
<b>5</b>	<b>6</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>3</b>

Participants 7 - 12

Total Scores

Week 25

Participant	V.E.2	V.C.2	N.V.C.2	E.C.2	PL.2	A.t.C.2	P.I.2	L.S.2
7	4	5	2	3	3	3	3	4
8	3	5	3	6	3	4	2	5
9	5	4	3	4	4	3	3	5
10	4	6	4	5	4	3	3	2
11	6	5	4	5	3	3	3	2
12	5	6	3	4	2	3	4	3
<b>Total</b>	<b>27</b>	<b>31</b>	<b>19</b>	<b>27</b>	<b>19</b>	<b>19</b>	<b>18</b>	<b>21</b>



**Table A 4 Parametric Analysis Showing Equality of Variance Across Groups A and B for Verbal Expression**

**Levene's Test of Equality of Error Variances**

	F	df1	df2	Sig.
Verbal Expression 1	.000	1	10	1.000
Verbal Expression 2	.313	1	10	.588

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a.

Design: Intercept+group  
Within Subjects Design: ve

**Table A 5 Parametric Analysis Showing Equality of Variance Across Groups A and B for Verbal Comprehension**

**Levene's Test of Equality of Error Variances**

	F	df1	df2	Sig.
Verbal Comprehension 1	.000	1	10	1.000
Verbal Comprehension 2	.160	1	10	.698

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a.

Design: Intercept+group  
Within Subjects Design: vc

**Table A 6 Parametric Analysis Showing Equality of Variance Across Groups A and B for Non-Verbal Comprehension**

**Levene's Test of Equality of Error Variances**

	F	df1	df2	Sig.
Non-Verbal Comprehension 1	2.500	1	10	.145
Non-Verbal Comprehension 2	3.071	1	10	.110

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a.

Design: Intercept+group  
Within Subjects Design: nvc

**Table A 7 Parametric Analysis Showing Equality of Variance Across Groups A and B for Eye Contact**

**Levene's Test of Equality of Error Variances<sup>a</sup>**

	F	df1	df2	Sig.
Eye Contact 1	.160	1	10	.698
Eye Contact 2	.172	1	10	.687

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a.

Design: Intercept+group  
Within Subjects Design: ec

**Table A 8 Parametric Analysis Showing of Equality of Variance Across Groups A and B for Play**

**Levene's Test of Equality of Error Variances<sup>a</sup>**

	F	df1	df2	Sig.
Play 1	.000	1	10	1.000
Play 2	3.846	1	10	.078

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a.

Design: Intercept+group  
Within Subjects Design: pl

**Table A 9 Parametric Analysis Showing Equality of Variance Across Groups A and B for Ability to Change**

**Levene's Test of Equality of Error Variances<sup>a</sup>**

	F	df1	df2	Sig.
Ability to Change 1	1.190	1	10	.301
Ability to Change 2	4.375	1	10	.063

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a.

Design: Intercept+group  
Within Subjects Design: atc



**Table A 10 Parametric Analysis Showing Equality of Variance Across Groups A and B for Peer Interaction**

**Levene's Test of Equality of Error Variances<sup>a</sup>**

	F	df1	df2	Sig.
Peer Interaction 1	.000	1	10	1.000
Peer Interaction 2	1.951	1	10	.193

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a.

Design: Intercept+group  
Within Subjects Design: pi

**Table A 11 Parametric Analysis Showing Equality of Variance Across Groups A and B for Listening Skills**

**Levene's Test of Equality of Error Variances<sup>a</sup>**

	F	df1	df2	Sig.
Listening Skills 1	.000	1	10	1.000
Listening Skills 2	.139	1	10	.717

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a.

Design: Intercept+group  
Within Subjects Design: ls

**Table A 12 Summary of Levene's Test Showing Equality of Variance Across Groups A and B at Time 1 and Time 2 for the Dependent Variables**

Variable	F-Statistic	Degree of Freedom 1	Degree of Freedom 2	Significance
Verbal Expression	.00	1	10	1.00
	.31	1	10	.59
Verbal Comprehension	.00	1	10	1.00
	.16	1	10	.69
Non-Verbal Comprehension	2.50	1	10	.15
	3.07	1	10	.11
Eye Contact	.16	1	10	.70
	.17	1	10	.69
Play	.00	1	10	1.00
	3.85	1	10	.08
Change Ability	1.19	1	10	.30
	4.38	1	10	0.63
Peer Interaction	.00	1	10	.30
	1.95	1	10	.19
Listening Skills	.00	1	10	1.00
	.14	1	10	.72



**Table A 13 Non-Parametric Analysis Showing Normality of Distribution for Group A for Verbal Expression when Time 1 is Subtracted from Time 2**

**One-Sample Kolmogorov-Smirnov Test**

		Change in Verbal Expression (time 2 - time 1)
N		6
Normal Parameters <sup>a,b</sup>	Mean	3.3333
	Std. Deviation	.51640
Most Extreme Differences	Absolute	.407
	Positive	.407
	Negative	-.259
Kolmogorov-Smirnov Z		.998
Asymp. Sig. (2-tailed)		.272

- a. Test distribution is Normal.
- b. Calculated from data.
- c. group = Group A

**Table A 14 Non-Parametric Analysis Showing Normality of Distribution for Group B for Verbal Expression when Time 1 is Subtracted from Time 2**

**One-Sample Kolmogorov-Smirnov Test**

		Change in Verbal Expression (time 2 - time 1)
N		6
Normal Parameters <sup>a,b</sup>	Mean	.5000
	Std. Deviation	.83666
Most Extreme Differences	Absolute	.392
	Positive	.275
	Negative	-.392
Kolmogorov-Smirnov Z		.959
Asymp. Sig. (2-tailed)		.316

- a. Test distribution is Normal.
- b. Calculated from data.
- c. group = Group B

**Table A 15 Non-Parametric Analysis Showing Normality of Distribution for Group A for Verbal Comprehension when Time 1 is Subtracted from Time 2**

**One-Sample Kolmogorov-Smirnov Test**

		Change in Verbal Comprehension (time 2 - time 1)
N		6
Normal Parameters <sup>a,b</sup>	Mean	2.5000
	Std. Deviation	.54772
Most Extreme Differences	Absolute	.319
	Positive	.319
	Negative	-.319
Kolmogorov-Smirnov Z		.782
Asymp. Sig. (2-tailed)		.573

a. Test distribution is Normal.

b. Calculated from data.

c. group = Group A

**Table A 16 Non-Parametric Analysis Showing Normality of Distribution for Group B for Verbal Comprehension when Time 1 is Subtracted from Time 2**

**One-Sample Kolmogorov-Smirnov Test**

		Change in Verbal Comprehension (time 2 - time 1)
N		6
Normal Parameters <sup>a,b</sup>	Mean	-.3333
	Std. Deviation	.51640
Most Extreme Differences	Absolute	.407
	Positive	.259
	Negative	-.407
Kolmogorov-Smirnov Z		.998
Asymp. Sig. (2-tailed)		.272

a. Test distribution is Normal.

b. Calculated from data.

c. Group = Group B



**Table A 17 Non-Parametric Analysis Showing Normality of Distribution for Group A for Non-Verbal Comprehension when Time1 is Subtracted from Time 2**

**One-Sample Kolmogorov-Smirnov Test**

		Change in Non-Verbal Comprehension (time 2 -time 1)
N		6
Normal Parameters <sup>a,b</sup>	Mean	3.1667
	Std. Deviation	1.47196
Most Extreme Differences	Absolute	.214
	Positive	.119
	Negative	-.214
Kolmogorov-Smirnov Z		.525
Asymp. Sig. (2-tailed)		.946

- a. Test distribution is Normal.
- b. Calculated from data.
- c. group = Group A

**Table A 18 Non-Parametric Analysis Showing Normality of Distribution for Group B for Non-Verbal Comprehension when Time1 is Subtracted from Time 2**

**One-Sample Kolmogorov-Smirnov Test**

		Change in Non-Verbal Comprehension (time 2 -time 1)
N		6
Normal Parameters <sup>a,b</sup>	Mean	.1667
	Std. Deviation	1.47196
Most Extreme Differences	Absolute	.286
	Positive	.286
	Negative	-.227
Kolmogorov-Smirnov Z		.701
Asymp. Sig. (2-tailed)		.710

- a. Test distribution is Normal.
- b. Calculated from data.
- c. group = Group B

**Table A 19 Non-Parametric Analysis Showing Normality of Distribution for Group A for Eye Contact when Time1 is Subtracted from Time 2**

**One-Sample Kolmogorov-Smirnov Test**

		Change in Eye Contact (time 2 - time 1)
N		6
Normal Parameters <sup>a,b</sup>	Mean	2.6667
	Std. Deviation	1.03280
Most Extreme Differences	Absolute	.293
	Positive	.207
	Negative	-.293
Kolmogorov-Smirnov Z		.718
Asymp. Sig. (2-tailed)		.681

a. Test distribution is Normal.

b. Calculated from data.

c. group = Group A

**Table A 20 Non-Parametric Analysis Showing Normality of Distribution for Group B for Eye Contact when Time1 is Subtracted from Time 2**

**One-Sample Kolmogorov-Smirnov Test**

		Change in Eye Contact (time 2 - time 1)
N		6
Normal Parameters <sup>a,b</sup>	Mean	-.5000
	Std. Deviation	.54772
Most Extreme Differences	Absolute	.319
	Positive	.319
	Negative	-.319
Kolmogorov-Smirnov Z		.782
Asymp. Sig. (2-tailed)		.573

a. Test distribution is Normal.

b. Calculated from data.

c. group = Group B



**Table A 21 Non-Parametric Analysis Showing Normality of Distribution for Group A for Play when Time1 is Subtracted from Time 2**

**One-Sample Kolmogorov-Smirnov Test**

		Change in Play (time 2 - time 1)
N		6
Normal Parameters <sup>a,b</sup>	Mean	2.3333
	Std. Deviation	.81650
Most Extreme Differences	Absolute	.293
	Positive	.207
	Negative	-.293
Kolmogorov-Smirnov Z		.717
Asymp. Sig. (2-tailed)		.682

a. Test distribution is Normal.

b. Calculated from data.

c. group = Group A

**Table A 22 Non-Parametric Analysis Showing Normality of Distribution for Group B for Play when Time1 is Subtracted from Time 2**

**One-Sample Kolmogorov-Smirnov Test**

		Change in Play (time 2 - time 1)
N		6
Normal Parameters <sup>a,b</sup>	Mean	-.3333
	Std. Deviation	.81650
Most Extreme Differences	Absolute	.293
	Positive	.293
	Negative	-.207
Kolmogorov-Smirnov Z		.717
Asymp. Sig. (2-tailed)		.682

a. Test distribution is Normal.

b. Calculated from data.

c. group = Group B

**Table A 23 Non-Parametric Analysis Showing Normality of Distribution for Group A for Ability to Change when Time1 is Subtracted from Time 2**

**One-Sample Kolmogorov-Smirnov Test**

		Change in Ability to Change (time 2 - time 1)
N		6
Normal Parameters <sup>a,b</sup>	Mean	2.5000
	Std. Deviation	.83666
Most Extreme Differences	Absolute	.392
	Positive	.392
	Negative	-.275
Kolmogorov-Smirnov Z		.959
Asymp. Sig. (2-tailed)		.316

a. Test distribution is Normal.

b. Calculated from data.

c. group = Group A

**Table A 24 Non-Parametric Analysis Showing Normality of Distribution for Group B for Ability to Change when Time1 is Subtracted from Time 2**

**One-Sample Kolmogorov-Smirnov Test**

		Change in Ability to Change (time 2 - time 1)
N		6
Normal Parameters <sup>a,b</sup>	Mean	.1667
	Std. Deviation	1.16905
Most Extreme Differences	Absolute	.223
	Positive	.223
	Negative	-.159
Kolmogorov-Smirnov Z		.547
Asymp. Sig. (2-tailed)		.926

a. Test distribution is Normal.

b. Calculated from data.

c. group = Group B



**Table A 25 Non-Parametric Analysis Showing Normality of Distribution for Group A for Peer Interaction when Time1 is Subtracted from Time 2**

**One-Sample Kolmogorov-Smirnov Test**

		Change in Peer Interaction (time 2 - time 1)
N		6
Normal Parameters <sup>a,b</sup>	Mean	2.8333
	Std. Deviation	1.16905
Most Extreme Differences	Absolute	.223
	Positive	.159
	Negative	-.223
Kolmogorov-Smirnov Z		.547
Asymp. Sig. (2-tailed)		.926

- a. Test distribution is Normal.
- b. Calculated from data.
- c. group = Group A

**Table A 26 Non-Parametric Analysis Showing Normality of Distribution for Group B for Peer Interaction when Time1 is Subtracted from Time 2**

**One-Sample Kolmogorov-Smirnov Test**

		Change in Peer Interaction (time 2 - time 1)
N		6
Normal Parameters <sup>a,b</sup>	Mean	-.1667
	Std. Deviation	.98319
Most Extreme Differences	Absolute	.302
	Positive	.302
	Negative	-.216
Kolmogorov-Smirnov Z		.739
Asymp. Sig. (2-tailed)		.646

- a. Test distribution is Normal.
- b. Calculated from data.
- c. group = Group B

**Table A 27 Non-Parametric Analysis Showing Normality of Distribution for Group A for Listening Skills when Time1 is Subtracted from Time 2**

**One-Sample Kolmogorov-Smirnov Test**

		Change in Listening Skills (time 2 - time 1)
N		6
Normal Parameters <sup>a,b</sup>	Mean	3.3333
	Std. Deviation	.51640
Most Extreme Differences	Absolute	.407
	Positive	.407
	Negative	-.259
Kolmogorov-Smirnov Z		.998
Asymp. Sig. (2-tailed)		.272

a. Test distribution is Normal.

b. Calculated from data.

c. group = Group A

**Table A 28 Non-Parametric Analysis Showing Normality of Distribution for Group B for Listening Skills when Time1 is Subtracted from Time 2**

**One-Sample Kolmogorov-Smirnov Test**

		Change in Listening Skills (time 2 - time 1)
N		6
Normal Parameters <sup>a,b</sup>	Mean	-.5000
	Std. Deviation	.83666
Most Extreme Differences	Absolute	.392
	Positive	.392
	Negative	-.275
Kolmogorov-Smirnov Z		.959
Asymp. Sig. (2-tailed)		.316

a. Test distribution is Normal.

b. Calculated from data.

c. group = Group B



**Table A 29 Parametric Analysis Showing the Treatment Effect for Verbal Expression by Comparing Time 2 - Time 1 Scores for Groups A and B**

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Change in Verbal Expression (time 2 - time 1)	Equal variances assumed	1.509	.247	7.059	10	.000	2.83333	.40139	1.93899	3.72768
	Equal variances not assumed			7.059	8.327	.000	2.83333	.40139	1.91402	3.75265

**Table A 30 Parametric Analysis Showing the Treatment Effect for Verbal Comprehension by Comparing Time 2 - Time 1 Scores for Groups A and B**

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Change in Verbal Comprehension (time 2 - time 1)	Equal variances assumed	.625	.448	9.220	10	.000	2.83333	.30732	2.14859	3.51808
	Equal variances not assumed			9.220	9.966	.000	2.83333	.30732	2.14826	3.51840

**Table A 31 Parametric Analysis Showing the Treatment Effect for Non-Verbal Comprehension by Comparing Time 2 - Time 1 Scores for Groups A and B**

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Change in Non-Verbal Comprehension (time 2 - time 1)	Equal variances assumed	.020	.889	3.530	10	.005	3.00000	.84984	1.10845	4.89355
	Equal variances not assumed			3.530	10.000	.005	3.00000	.84984	1.10845	4.89355

**Table A 32 Parametric Analysis Showing the Treatment Effect for Eye Contact by Comparing Time 2 - Time 1 Scores for Groups A and B**

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Change in Eye Contact (time 2 - time 1)	Equal variances assumed	1.359	.271	6.635	10	.000	3.16667	.47728	2.10328	4.23007
	Equal variances not assumed			6.635	7.608	.000	3.16667	.47728	2.08811	4.27723

**Table A 33 Parametric Analysis Showing the Treatment Effect for Play by Comparing Time 2 - Time 1 Scores for Groups A and B**

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Change in Play (time 2 - time 1)	Equal variances assumed	.000	1.000	5.657	10	.000	2.66667	.47140	1.61631	3.71702
	Equal variances not assumed			5.657	10.000	.000	2.66667	.47140	1.61631	3.71702

**Table A 34 Parametric Analysis Showing the Treatment Effect for Ability to Change by Comparing Time 2 - Time 1 Scores for Groups A and B**

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Change in Ability to Change (time 2 - time 1)	Equal variances assumed	.506	.493	3.976	10	.003	2.33333	.58689	1.02565	3.64101
	Equal variances not assumed			3.976	9.057	.003	2.33333	.58689	1.00697	3.65970

**Table A 35 Parametric Analysis Showing the Treatment Effect for Peer Interaction by Comparing Time 2 - Time 1 Scores for Groups A and B**

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Change in Peer Interaction (time 2 - time 1)	Equal variances assumed	.034	.858	4.811	10	.001	3.00000	.62361	1.61051	4.38949
	Equal variances not assumed			4.811	9.715	.001	3.00000	.62361	1.60498	4.39504

**Table A 36 Parametric Analysis Showing the Treatment Effect for Listening Skills by Comparing Time 2 - Time 1 Scores for Groups A and B**

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Change in Listening Skills (time 2 - time 1)	Equal variances assumed	1.509	.247	9.550	10	.000	3.83333	.40139	2.93899	4.72768
	Equal variances not assumed			9.550	8.327	.000	3.83333	.40139	2.91402	4.75265



**Table A 37 Parametric Analysis Showing the Treatment Effect for Group A Between Time 1 and Time 2 for Verbal Expression**

**Paired Samples Test<sup>a</sup>**

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Verbal Expression 1 - Verbal Expression 2	-3.33333	.51640	.21082	-3.87528	-2.79141	-15.811	5	.000

a. group = Group A

**Table A 38 Parametric Analysis Showing the Treatment Effect for Group A Between Time 1 and Time 2 for Verbal Comprehension**

**Paired Samples Test<sup>a</sup>**

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Verbal Comprehension 1 - Verbal Comprehension 2	-2.50000	.54772	.22361	-3.07480	-1.92520	-11.180	5	.000

a. group = Group A

**Table A 39 Parametric Analysis Showing the Treatment Effect for Group A Between Time 1 and Time 2 for Non-Verbal Comprehension**

**Paired Samples Test<sup>a</sup>**

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Non-Verbal Comprehension 1 - Non-Verbal Comprehension 2	-3.16667	1.47198	.60093	-4.71139	-1.62194	-5.270	5	.003

a. group = Group A

**Table A 40 Parametric Analysis Showing the Treatment Effect for Group A Between Time 1 and Time 2 for Eye Contact**

**Paired Samples Test<sup>a</sup>**

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Eye Contact 1 - Eye Contact 2	-2.66667	1.03280	.42164	-3.75052	-1.58281	-8.325	5	.001

a. group = Group A

**Table A 41 Parametric Analysis Showing the Treatment Effect for Group A Between Time 1 and Time 2 for Play**

**Paired Samples Test<sup>a</sup>**

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Play 1 - Play 2	-2.33333	.81650	.33333	-3.19019	-1.47647	-7.000	5	.001

a. group = Group A

**Table A 42 Parametric Analysis Showing the Treatment Effect for Group A Between Time 1 and Time 2 for Ability to Change**

**Paired Samples Test<sup>a</sup>**

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Ability to Change 1 - Ability to Change 2	-2.50000	.83666	.34157	-3.37802	-1.62198	-7.319	5	.001

a. group = Group A

**Table A 43 Parametric Analysis Showing the Treatment Effect for Group A Between Time 1 and Time 2 for Peer Interaction**

**Paired Samples Test<sup>a</sup>**

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Peer Interaction 1 - Peer Interaction 2	-2.83333	1.16905	.47726	-4.06017	-1.60650	-5.937	5	.002

a. group = Group A

**Table A 44 Parametric Analysis Showing the Treatment Effect for Group A Between Time 1 and Time 2 for Listening Skills**

**Paired Samples Test<sup>a</sup>**

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Listening Skills 1 - Listening Skills 2	-3.33333	.51640	.21082	-3.87528	-2.79141	-15.811	5	.000

a. group = Group A



**Table A 45 Dependent Samples Statistics Showing the Effect Size for Group A Based on Difference in Scores Between Time 1 and Time 2 for Verbal Expression**

**Paired Samples Statistics<sup>a</sup>**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Verbal Expression 1	5.0000	6	1.41421	.57735
	Verbal Expression 2	8.3333	6	1.21106	.49441

a. group = Group A

**Table A 46 Dependent Samples Statistics Showing the Effect Size for Group A Based on Difference in Scores Between Time 1 and Time 2 for Verbal Comprehension**

**Paired Samples Statistics<sup>a</sup>**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Verbal Comprehension 1	5.5000	6	1.04881	.42817
	Verbal Comprehension 2	8.0000	6	.89443	.36515

a. group = Group A

**Table A 47 Dependent Samples Statistics Showing the Effect Size for Group A Based on Difference in Scores Between Time 1 and Time 2 for Non-Verbal Comprehension**

**Paired Samples Statistics<sup>a</sup>**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Non-Verbal Comprehension 1	3.0000	6	.63246	.25820
	Non-Verbal Comprehension 2	6.1667	6	1.47196	.60093

a. group = Group A

**Table A 48 Dependent Samples Statistics Showing the Effect Size for Group A Based on Difference in Scores Between Time 1 and Time 2 for Eye Contact**

**Paired Samples Statistics<sup>a</sup>**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Eye Contact 1	4.8333	6	.75277	.30732
	Eye Contact 2	7.5000	6	1.37840	.56273

a. group = Group A

**Table A 49 Dependent Samples Statistics Showing the Effect Size for Group A Based on Difference in Scores Between Time 1 and Time 2 for Play**

**Paired Samples Statistics<sup>a</sup>**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Play 1	3.5000	6	1.04881	.42817
	Play 2	5.8333	6	1.32916	.54263

a. group = Group A

**Table A 50 Dependent Samples Statistics Showing the Effect Size for Group A Based on Difference in Scores Between Time 1 and Time 2 for Ability to Change**

**Paired Samples Statistics<sup>a</sup>**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Ability to Change 1	3.1667	6	.75277	.30732
	Ability to Change 2	5.6667	6	.81650	.33333

a. group = Group A

**Table A 51 Dependent Samples Statistics Showing the Effect Size for Group A Based on Difference in Scores Between Time 1 and Time 2 for Peer Interaction**

**Paired Samples Statistics<sup>a</sup>**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Peer Interaction 1	2.8333	6	.75277	.30732
	Peer Interaction 2	5.6667	6	1.03280	.42164

a. group = Group A

**Table A 52 Dependent Sample Statistics Showing the Effect Size for Group A Based on Difference in Scores Between Time 1 and Time 2 for Listening Skills**

**Paired Samples Statistics<sup>a</sup>**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Listening Skills 1	4.0000	6	1.41421	.57735
	Listening Skills 2	7.3333	6	1.75119	.71492

a. group = Group A



**APPENDIX SIX**  
**(PSYCHOMETRIC PROFILES)**

- 1. WECHSLER INTELLIGENCE SCALE**
- 2. WECHSLER OBJECTIVE READING DIMENSIONS**

**Table A 53 Showing Assessment Data for the Verbal Subtests Scores Achieved by the Participants Based on the WISC-III**

Identity	Information	Similarities	Arithmetic	Vocabulary	Comprehension	Scaled Score	Verbal I.Q
P1	11	08	07	10	05	41	89
P2	12	11	06	15	15	59	110
P3	07	09	13	04	05	38	83
P4	09	08	10	06	04	37	84
P5	14	06	11	09	03	43	91
P6	05	09	04	05	05	28	74
P7	08	08	07	10	06	39	87
P8	14	07	19	09	05	54	104
P9	04	05	02	08	03	22	67
P10	07	05	02	06	03	23	68
P11	04	03	03	04	02	16	61
P12	05	03	04	04	03	23	68
Mean scores	8.3	6.8	7.3	7.5	4.9	35.25	82.1

**Table A 54 Showing Assessment Data for the Performance Subtest Scores Achieved by the Participants Based on the WISC-III**

Identity	Picture Completion	Coding	Picture Arrangement	Block Design	Object Assembly	Scaled Score	Performance I.Q.
P1	12	08	05	12	05	42	88
P2	13	07	05	13	06	44	91
P3	08	06	07	12	13	46	94
P4	10	08	08	07	07	40	85
P5	11	08	05	13	02	39	84
P6	08	07	07	10	08	40	85
P7	09	06	05	15	07	42	88
P8	07	08	04	14	08	41	86
P9	06	03	04	07	05	35	67
P10	06	05	04	07	04	26	68
P11	04	01	04	09	03	21	63
P12	08	04	03	08	04	27	70
Mean scores	8.5	5.9	5.1	10.5	6.0	36.9	80.8



**Table A 55 Showing Predicted Literacy Attainment Levels Based on the Full Scale I.Q. of the Participants as Assessed on the WORD**

WORD	FSIQ's	Predicted Basic Reading score	Predicted Spelling score	Predicted Reading Comprehension score
Participants				
P1	88	12.03 years	11.09 years	12.00 years
P2	96	12.09 years	12.06 years	12.09 years
P3	87	11.09 years	11.09 years	12.00 years
P4	81	10.03 years	10.03 years	10.06 years
P5	86	12.03 years	11.09 years	12.00 years
P6	77	9.03 years	9.03 years	9.09 years
P7	88	9.09 years	10.06 years	10.00 years
P8	96	10.09 years	11.09 years	11.00 years
P9	76	9.00 years	9.03 years	9.00 years
P10	66	8.03 years	8.09 years	7.09 years
P11	60	8.03 years	8.06 years	8.00 years
P12	66	9.00 years	7.09 years	8.09 years

**Table A 56 Showing Assessed Literacy Levels of the Participants Showing Evidence of Higher Basic Reading and Lower Comprehension Scores than Predicted**

WORD	Full Scale I.Q.	Actual Basic Reading score	Actual Spelling score	Actual Reading Comprehension score	Chronological Age
Participants					
P1	88	17.00 years	14.00 years	13.09 years	13.09 years
P2	96	17.00 years	11.09 years	9.09 years	13.01 years
P3	87	13.08 years	10.06 years	9.06 years	13.05 years
P4	81	17.00 years	9.09 years	9.03 years	12.08 years
P5	86	17.00 years	17.00 years	9.10 years	15.02 years
P6	77	14.00 years	8.09 years	8.06 years	12.02 years
P7	88	17.00 years	10.03 years	9.06 years	12.07 years
P8	96	16.09 years	14.09 years	8.00 years	11.04 years
P9	76	11.09 years	9.00 years	8.06 years	11.02 years
P10	66	8.03 years	8.09 years	7.09 years	12.04 years
P11	60	8.03 years	8.06 years	8.00 years	12.01 years
P12	66	9.00 years	7.09 years	8.09 years	12.04 years

**Table A 57 Showing the Predicted Standard Scores of the Participants Based on FSIQ.**

WORD	FSIQ's	Predicted standard score for Basic Reading	Predicted standard score for Spelling	Predicted standard score for Reading Comprehension	Chronological Age
Participants					
P1	88	93	94	92	13.9 years
P2	96	98	98	97	13.1 years
P3	87	93	93	91	13.5 years
P4	81	89	90	87	12.8 years
P5	86	92	93	91	15.2 years
P6	77	86	88	85	12.2 years
P7	88	93	94	92	12.7 years
P8	96	98	98	97	11.4 years
P9	76	86	88	84	11.2 years
P10	66	80	82	77	12.4 years
P11	60	76	79	73	12.1 years
P12	66	80	82	77	12.4 years

**Table A:58 Showing Actual Standard Scores Achieved by the Participants on the WORD**

WORD	FSIQ's	Basic Reading Score	Spelling Score	Reading Comprehension Score	Chronological Age
Participants					
P1	88	117	101	97	13.9 years
P2	96	113	99	85	13.1 years
P3	87	92	93	91	13.5 years
P4	81	110	87	80	12.8 years
P5	86	92	93	91	15.2 years
P6	77	118	94	90	12.2 years
P7	88	122	111	76	12.7 years
P8	96	122	111	76	11.4 years
P9	76	102	86	80	11.2 years
P10	66	91	94	85	12.4 years
P11	60	74	78	71	12.1 years
P12	66	81	72	77	12.4 years