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## CHAPTER SIX

### EMPIRICAL RESEARCH FINDINGS

#### 6.1 INTRODUCTION

Autism is a challenging and increasingly common disorder. “Autism knows no boundaries, no nations, and no race. It seems to be as much a part of us as love, and the common cold, as genius, as art” (Autism Primer, 2002). Autism has a big impact on our society, as can be seen in the statistics given by Autism Western Cape (2005) and the Autism Society of America (2005), as discussed in Chapter 2.

Stacey (2002) states that the most difficult thing to deal with was “accepting the fact that Michael (the autistic child) will never get better, that this is a lifelong problem and worry”. Botha (2005) further comments on this, stating, “It is hard to believe that life is never going to just be normal”. According to the researcher, both these comments indicate the great need for support for individuals affected by the disorder.

Child and Family Canada (2006) consider the following to be important issues in middle childhood:

- Self-esteem: The middle years are vital to a child’s growing sense of self-esteem. The child is getting a stronger idea of who he/she is.
- Relationships with parents: Successful interaction with parents contributes greatly to a positive sense of self.
- Relationships with peers: The child will go to great lengths to gain a sense of accomplishment in relation to his/her peers.
- Physical abilities: During the middle years a child will gain a growing sense of competence in relation to their physical abilities.



- Cognitive and language development: The child now has the ability to know what to do on a day-to-day basis as well as the ability to do it.
- Siblings: The middle years are a time when siblings will usually work together.

The above definition gives a good indication of the development and focus areas of a neurotypical child going through the stages of middle childhood. With a child who has been diagnosed with autism, the stages and changes of middle childhood are significantly different (refer to chapter 3). The respondents of this particular study were in middle childhood, therefore between the age of 6 and 12 years. It is important to note, however, that due to the individual's diagnosis on the autism spectrum, the focus of the study was more on the particular behaviour of each individual, due to their diagnosis, rather than the specific age of the individual.

In an attempt to provide support for such individuals, the researcher formulated the goal of this study as follows:

***To develop and evaluate the effectiveness of a play technique programme to enhance the social behaviour of autistic children between the ages of six and 12 years.***

Accordingly, the researcher developed the following study objectives:

- ***To theoretically conceptualize autism as a phenomenon in middle childhood and the impact thereof on the family system, as well as play techniques in the context of autism.***
- ***To explore the nature, on a national and international level, of existing play technique programmes for autistic children.***
- ***To develop a play technique programme for autistic children.***
- ***To implement the play technique programme.***



- ***To evaluate the effectiveness of the play technique programme.***
- ***To come to conclusions and make recommendations to enhance the effectiveness of the play technique programme for autistic children.***

Robledo and Ham-Kucharski (2005: 1) state that “autism is a neurological disorder that usually manifests itself early in the toddler years. It hampers a child’s ability to learn how to communicate, interact with others socially, and indulge in imaginative play”. The National Alliance for Autism Research (2006) states that autism is “a complex brain disorder that often inhibits a person’s ability to communicate, respond to surroundings and form relationships with others”.

Against the background of the objectives, as well as on the understanding of autism spectrum disorder, as commented on in the previous definitions, the following hypothesis and sub-hypotheses were formulated:

***If autistic children are involved in the play technique programme, then their social behaviour will improve.***

- ***If autistic children are involved in the play technique programme then their verbal communication skills will improve.***
- ***If autistic children are involved in a play technique programme then their non-verbal communication skills will improve.***
- ***If autistic children are involved in a play technique programme then their social interaction skills will improve.***
- ***If autistic children are involved in a play technique programme then their challenging behaviours will decrease.***

The research approach adopted was quantitative in nature. Creswell (in Fouché & Delport, 2002:79) defines quantitative research as “A paradigm based on positivism, which takes scientific explanation to be nomothetic (i.e. based on



universal law). Its main aims are to measure the social world objectively, to test hypotheses and to predict and control human behaviour”.

Intervention research was the most appropriate type of research for this particular study. This was due to the fact that the researcher was aiming to conduct an intervention, namely a play technique programme, which was attempting to impact a particular problem within society, namely the lack of support provided for parents and/or professionals dealing with autistic children in middle childhood. De Vos (2002: 396) defines intervention research as “studies carried out for the purpose of conceiving, creating and testing innovative human services approaches to prevent or ameliorate problems or to maintain quality of life”.

The main focus of this chapter is to display, analyze and interpret the quantitative data collected by means of structured observation using a self-constructed measuring instrument. Tables bar and column graphs as well as pie charts have been used for the presentation of the data.

## **6.2 RESEARCH METHODOLOGY**

### **6.2.1 Research Design**

The researcher utilized the quasi-experimental one-group pre-test–post-test design in this study. The one-group pre-test–post-test design, according to Fouché and De Vos (2002: 144), has a built-in strategy for comparing pre-test with post-test. In this particular design there is a measurement (pre-test) of a dependent variable (the autistic children’s social behaviour) when no independent variable (play technique programme) is present. Subsequently the independent variable is introduced, followed by a repeated measurement (post-test) of the dependent variable.



### 6.2.1.1 Sample and sampling technique

The respondents were 12 autistic children in middle childhood (between six and 12 years of age) from The Key School for Specialized Education in Parktown West, an urban area in the north of Johannesburg. The school consists of children who are developmentally challenged, with the majority of them being diagnosed on the autism spectrum. The children come from all areas around Johannesburg, given that this is one of the few schools of its kind in the greater Johannesburg area.

The school was selected from all the schools in Johannesburg for the following reasons: (a) accessibility; (b) number of autistic children in the school; (c) age of the children attending the school; and (d) willingness to participate in the study. Throughout the study the school principal and teachers gave their full cooperation and support.

In this study the sampling method that was used was probability sampling, more specifically a combination of stratified and systematic sampling. Grinnel and Williams (1990: 119) state that “a probability sample is one in which all the people or units in the sampling frame have the same known probability of being selected for the sample”. Stratified sampling consists of “the grouping of units composing a population into homogeneous groups (or strata) before sampling. This procedure, which may be used in conjunction with simple random, systematic, or cluster sampling, improves the representativeness of a sample, at least in terms of the stratification variables” (Strydom & Venter, 2002: 205). Systematic sampling involves selecting the first case randomly, preferably from a random table, and then all subsequent cases are selected according to a particular interval (Strydom & Venter, 2002: 205).

In this particular study four classes, which had already been divided at the school according to level of functioning, could be considered the strata. From each



stratum the researcher selected three participants through systematic sampling. Systematic sampling was conducted by randomly selecting the first participant from the class list and then selecting every third child in order to gather a group of twelve children. In this study the gender of the participants was considered irrelevant.

For a child to be included in the sample it was required that he/she be between the ages of six and 12 and been diagnosed on the autism spectrum.

It was essential that the child's parent/s or legal guardian had signed the consent form (see Addendum C). All 12 children were involved in a six-week play technique programme, with half an hour phases once a week held at The Key School for Specialized Education.

#### 6.2.1.2 Data collection method

A self-constructed measuring instrument, in the form of a scale, was used to evaluate the respondents' changes in social behaviour, owing to exposure to the play technique programme (see Addendum B).

The change of the respondents' social behaviour was observed through the use of structured observation. Structured observation, according to Bailey (1994: 246), involves "counting the frequency with which certain behaviours occur or certain things are said". The behaviour was monitored according to the self-constructed measuring instrument. This was done according to a 5-point scale, with the specific rating being linked to the number of times that the behaviour being measured was noted. For example a rating of 1 (very poor/did not appear) indicated that the behaviour was not noted at all at the time of the measurement whereas a rating of 5 (very good/completely) indicates that the behaviour was



noted on 4 or more occasions at the time of the measurement. A self-constructed measuring instrument was used in this study because there was no applicable measuring instrument available that had already been developed.

As previously mentioned, the focus was on the change of the respondents' social behaviour. Social behaviour is defined as "how the person interacts with others (e.g. habituated body signals; general voice characteristics; style of speech; visible handicaps)" (Google, 2005). Answers.com (2005) elaborates by stating that social behaviour is "behaviour directed at other people ... it is more advanced than behaviour or an action".

In order to measure the social behaviour of the respondents, the researcher has developed a measuring instrument in the form of a five point scale, based on the literature review. The measuring instrument consisted of four categories:

- (a) Verbal communication
- (b) Non-verbal communication
- (c) Social interaction
- (d) Challenging behaviour

These four categories included various assessment areas that were rated on a five-point scale. Each point was given the following values:

- **1:** Very Poor/Did not appear (no occurrence of the particular behaviour being measured)
- **2:** Poor/To a little extent (behaviour noted on one occasion within the time period of the measurement)
- **3:** Average/To some extent (behaviour noted on two occasions within the time period of the measurement)
- **4:** Good/To a great extent (behaviour noted on three occasions within the time period of the measurement)



- **5:** Very good/Completely (behaviour noted on four or more occasions within the time period of the measurement)

The following specific behaviours/assessment areas were rated on the five-point scale (see Addendum B) within the four categories mentioned above:

(a) Verbal communication

- Level of spontaneous speech regarding respondents' needs
- Level of spontaneous speech regarding respondents' feelings
- Comprehensive speech regarding general social interaction
- Comprehensive speech regarding present events within the phase
- Appropriate speech within the phase
- Ability to express comprehension
- Speech when required
- Appropriate use of vocabulary
- Appropriate sentence structure
- Clarity of speech
- Use of tone when speaking

(b) Non-verbal communication

- Facial expressions, for the purpose of communication
- Gestures
- Appropriate use of personal space
- Eye contact
- Interest in listening to the researcher
- Appropriate use of silence
- Level of appropriate response to listening
- Ability to focus
- Concentration span





- Attentiveness
- Openness to researcher

(c) Social interaction

- Level of interest in social interaction
- Desire for physical contact with researcher
- Desire for emotional contact with researcher
- Participation in play phase
- Ability to reach out, emotionally, within the phase
- Ability to show obedience to any instructions, both verbal and non-verbal
- Reaction/level of comfort to social interaction
- Appropriate response to social interaction
- Interaction cues
- Invitation cues
- Awareness of researcher
- Level of motivation

(d) Challenging behaviour

- Repetitive behaviour
- Inappropriate behaviour
- Self-injurious behaviour
- Aggressive behaviour
- Agitation
- Anxiety
- Avoidance
- Distractibility

In the following sections the researcher will present the research findings that resulted from this particular study. The data will be structured in the following



manner. The initial sections will focus on the biographical details of the respondents' involved in the study, namely their age, gender, race/ethnicity and home language. The focus will then be on the empirical results of the study, commenting on the results achieved in both the pre- and post-tests according to the four categories mentioned previously.

## **6.3 RESEARCH FINDINGS**

Quantitative data can either be analyzed manually or by computer (De Vos et al., (2002: 222). Rubin and Babbie (2001: 44) state that quantitative research emphasizes “the production of precise and generalizable statistical findings ... it verifies whether a cause produces an effect in general”.

In this study the researcher analyzed the data through the use of the computer, particularly MS Word, and with assistance from the Department of Statistics at the University of Pretoria, using two programmes, namely BMP Statistical Software and SAS (version 8.2). The collected quantitative data will now be displayed by means of tables and graphical presentations as well as written explanations.

### **6.3.1 Biographical details of respondents**

Biographical details can be understood as the details of an individual's life (Oxford Pocket Dictionary, 2004). This can include an individual's age, gender, religion, culture, home language, and marital status.

In the following sections biographical factors, namely the respondents' age, gender, race and home language, are discussed.



### 6.3.1.1 The respondents' age group

The respondents in this study fell into the age group of middle childhood. Middle childhood is defined as “the years between six – 12 years, generally when children starting attending school until they reach adolescence” (National Network for Child Care, 2006). Child and Family Canada (2006) adds that middle childhood can be defined as “a time when children are beginning to assume a larger share of responsibility for their own behaviour in relationship to their parents, peers and others”.

However, as stated by The Source (2006), autism is “a life-long developmental disability which impairs various aspects of typical development and lasts a lifetime”. Therefore, in the researcher’s opinion, children who are on the autism spectrum do not experience the same changes and challenges as a child who is not on the spectrum, when developing in middle childhood. These differences were noted in Chapter 3. However, for this study, the respondents all fell into the specific age group of middle childhood.

It is important to note that the children who are registered at The Key School for Specialized Education all fall between the ages of 4 years and 12 years, which is due to a requirement in registering at the school. As previously mentioned, this is one of the factors that influenced the researcher to approach The Key School for Specialized education. Table 5 presents the age composition of the respondents.

**Table 5: Age composition of respondents**

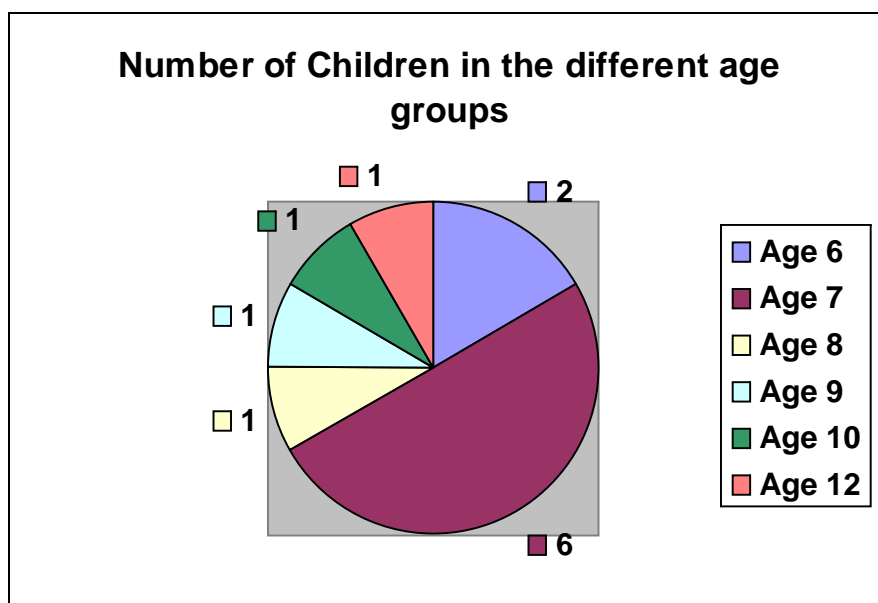
AGE	FREQUENCY
6	2
7	6
8	1
9	1

10	1
11	0
12	1
<b>TOTAL</b>	<b>12</b>

Table 5 allows one to come to the following conclusions:

- The developmental phase for 100% of the respondents is middle childhood (between the ages of six and 12).
- A total of 6 (50%) of the respondents were seven years old.
- Two (16,6%) of the respondents were six years old.
- The age groups of eight, nine, 10 and 12 years old all had a representation of 8%/one respondent.
- None of the respondents fell into the age group of 11 years old.

The following pie chart shows the data given in Table 5.



**Diagram 4: A pie chart of the age of respondents**



### 6.3.1.2 The respondents' gender

In this study the target population was autistic children in middle childhood. Information on each respondent's gender was gathered in order to demonstrate that both sexes were represented within the target group.

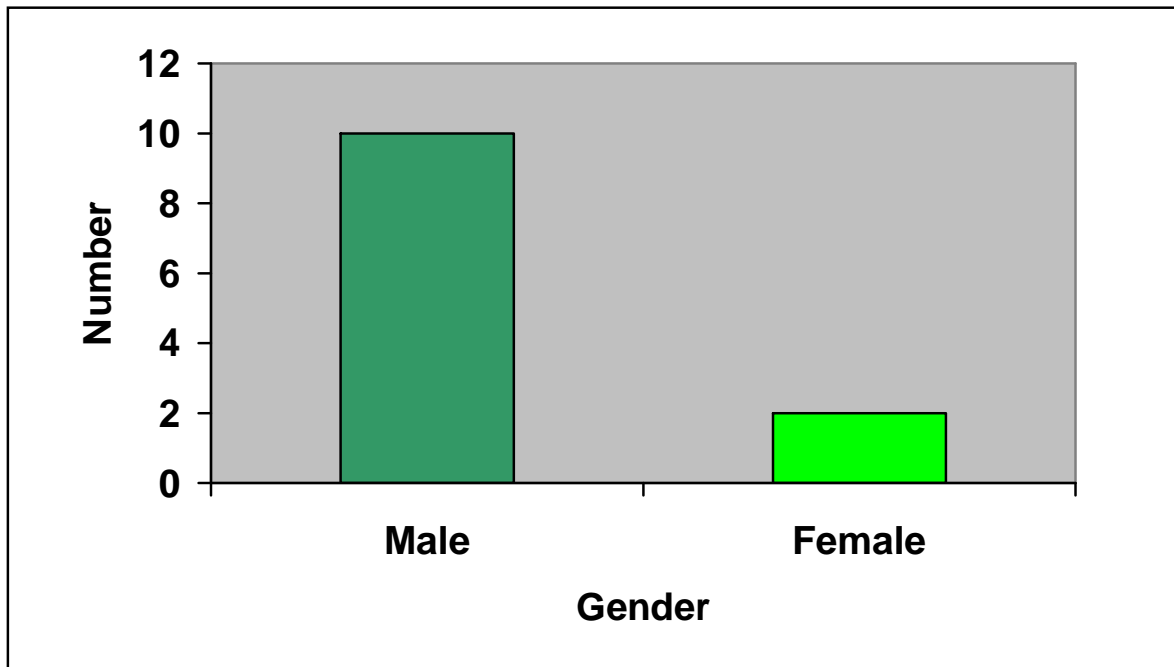
However, it is important to note that the ratio difference between males and females is large (refer to Table 6). This statistic merely confirmed the statement made by The New England Center for Children (2006), namely that "autism occurs 3 – 4 times more often in boys than in girls."

Table 6 presents the gender of the various respondents participating in the study.

**Table 6: Gender of respondents**

GENDER	FREQUENCY	PERCENTAGE
MALE	10	85%
FEMALE	2	15%
TOTAL	12	100%

The same information shown in Table 6 is now given visually. Diagram 5 below is a bar graph of the gender distribution of the respondents participating in the study. Again, when looking at this bar graph, one can clearly see the great difference in the number of males and females involved in the study.



**Diagram 5: Gender of the respondents involved in the study**

### 6.3.1.3 The respondents' race

In this study the race was not considered a vital variable, as the main criterion was that the respondent had been diagnosed on the autism spectrum.

However, the researcher is of the belief that it is important to consider the race of each respondent, given that each child's specific culture could have an impact on his/her social behaviour, outside of the diagnosis of autism.

Table 7 gives an indication of the different races. There was a relatively equal number of respondents within the various races; however, the dominant race was black (6 respondents).



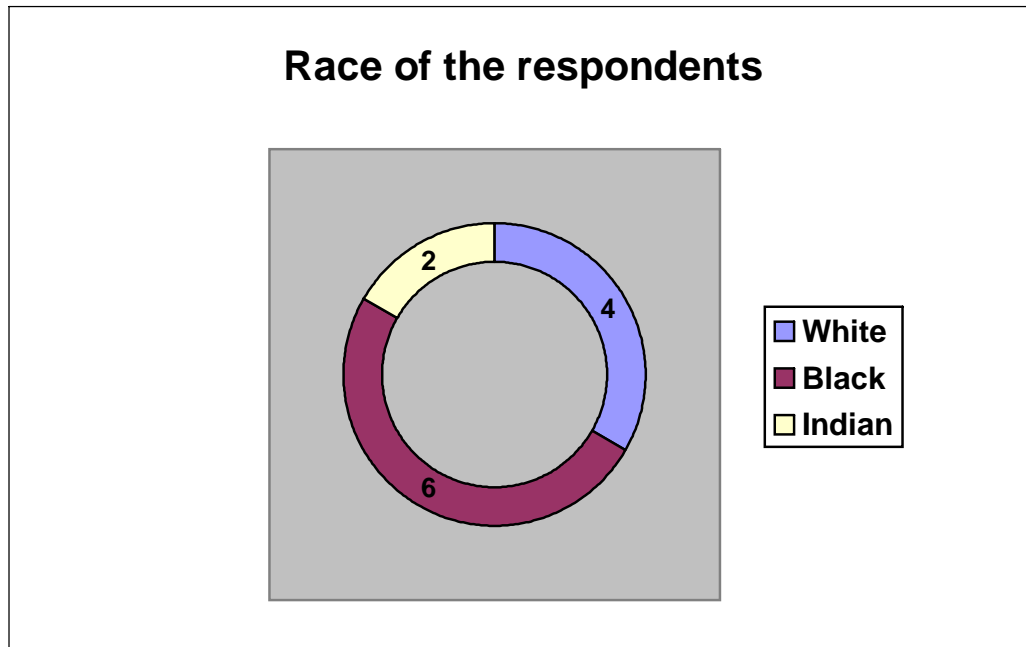
**Table 7: Race of respondents included in the study**

<b>RACE</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
WHITE	4	33.3%
BLACK	6	50%
INDIAN	2	16.6%
<b>TOTAL</b>	<b>12</b>	<b>100%</b>

At The Key School for Specialized Education there is no emphasis placed on the race of the child who is enrolling in the school. The school considers only the diagnosis, which the majority of the time is on the autism spectrum. Owing to the fact that there is no discrimination at the school based on race, the researcher was given the opportunity to involve children of different races in this particular study.

The researcher is of the opinion that the specific race of the child did not have a noticeable impact on the child's social behaviour, given that their social behaviour appeared to be solely dependent on their diagnosis on the autism spectrum.

Diagram 6 gives a pictorial view of the race of the respondents involved in the study. Again, one is able to see that there was a good representation of various races.



**Diagram 6: Graphical presentation of the race of the respondents**

#### 6.3.1.4 The respondents' home language

Once again the respondents' home language was not considered a pertinent variable within this study. However, it is still of interest to highlight the different languages of the children involved.

It is important to note that all the phases held with the respondents were done in English, given that this is the researcher's first language and it is the language through which the respondents are educated. However, for a large percentage (50%) of the respondents English is not their home language.

Table 8 gives an overview of the home languages of the respondents included in the study.





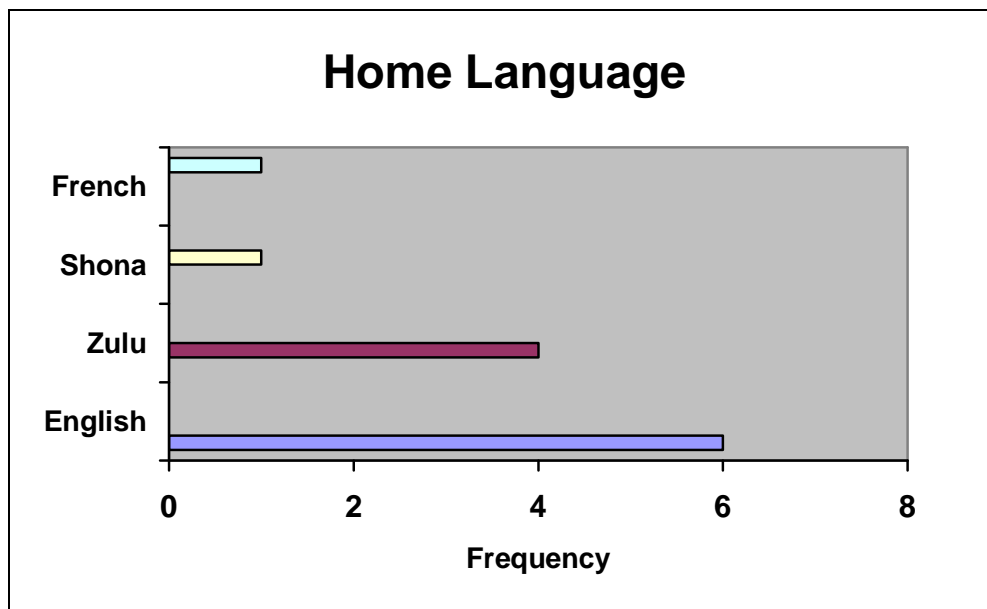
**Table 8: Home language of respondents**

HOME LANGUAGE	FREQUENCY	PERCENTAGE
ENGLISH	6	50%
ZULU	4	33.3%
SHONA	1	8,3%
FRENCH	1	8,3%
<b>TOTAL</b>	<b>12</b>	<b>100%</b>

Table 8 reveals the following:

- Half (50%) of the respondents use English as their home language.
- The second highest percentage, as regards home languages, is Zulu, with 33,3% (4) of the respondents speaking Zulu at home.
- Finally, 8,3% (1) of respondents, respectively, speak Shona and French.

Diagram 7 presents this information in a pictorial form.



**Diagram 7: Home language of respondents**

As mentioned at the beginning of this section, various aspects of one's biographical details could be focused on. However, the researcher has highlighted the aspects that can be considered of interest for this particular study.

The following sections will now focus on the empirical data that was gathered, through using a self-constructed measuring instrument, when involving the respondents in the play technique programme.

The focus will be on the scores that the respondents received, in the pre- and post-test scoring. These scores will be represented in various visual forms as well as through written information. This is in order to highlight the changes that took place once the intervention had been implemented.



## 6.4 Empirical results: Social behaviour of autistic children

The following section will focus on the empirical results of the social behaviour of the respondents (autistic children) involved in the play technique programme.

As previously noted, autism has three core features, namely “impairments in social interaction, impairments in verbal and nonverbal communication, and restricted and repetitive patterns of behaviour” (Wetherby & Prizant, 2000: 1). As can be seen in the self-constructed measuring instrument (see Addendum C), these core features formed the basic elements of the measurement.

Google (2005) states that social behaviour is “how the person interacts with others (e.g. habituated body signals; general voice characteristics; style of speech; visible handicaps)”. This definition indicates that the social behaviour of autistic children involves communication, both verbal and non-verbal, and interaction, and is influenced by any visible handicaps. Through this definition, as well as various others given for social interaction, the researcher was able to identify and focus, in the context of this study, on the four key elements of autistic children’s social behaviour, namely verbal communication; non-verbal communication; interaction; and challenging behaviour.

Therefore, the focus, when using the play technique programme, was to measure change in these core features, namely: verbal and non-verbal communication; social interaction; and challenging behaviours. These core features combined can be considered the social behaviour of the autistic children.

In order to measure these core elements of social behaviour the researcher administered the quasi-experimental one-group pre-test–post-test design. The social behaviour of the selected sample group of 12 autistic children in middle childhood was measured individually at the beginning of the study i.e. before



implementation of the play technique programme (pre-test), through the use of the self-constructed scale within structured observation. Thereafter each child was involved in six individual phases using various play techniques. After implementation of the programme each respondent was measured again (post-test). This enabled the researcher to measure the effectiveness of the intervention by comparing the pre- and post-test measurements.

As previously mentioned, the intervention to enhance the social behaviour of autistic children in middle childhood was in the format of a play technique programme. Within the play technique programme there were various techniques that were focused on. These were included in the various phases, with all the techniques being repeated throughout the programme.

The following play techniques, based on the literature review, were utilized in six phases with each respondent individually.

(a) Phase one

This was the introductory phase. The goal of the phase was to begin developing a relationship between the respondent and the researcher, in order to facilitate a positive working environment. The play activities included puzzles, games, books, and a CD player and CDs to play background music.

(b) Phase two

The goal of this phase was to expose the respondent to sensory experiences in order to increase his/her sensory awareness. The play techniques included in this phase included the sand tray and plastic animals, water and plastic toys, and clay/play dough.



(c) Phase three

The goal of this phase was to encourage the respondent to express him/herself more adequately. The play techniques used in this phases included drawing, play dough, and puppets and dolls.

(d) Phase four

The goal of this phase was to deepen the child's level of expression, through play techniques such as painting, puppets and dolls and sand tray and plastic animals.

(e) Phase five

The goal of this phase was to further deepen the child's level of expression. The play techniques focused on in this phases included bibliotherapy (books), drawing and play dough.

(f) Phase six

The goal of this phase was to terminate the programme with the respondent. The play activities included puzzles, games, books and a CD player and CDs to play background music (refer to Chapter 5 to see the full play technique programme).

Each element – namely, verbal communication, non-verbal communication, social interaction, and challenging behaviour – will now be analyzed and interpreted according to the pre- and post-test results. Each variable (element of social behaviour) is operationalized in the context of autism, by referring to the specific assessment areas that were measured.



These results will be discussed in various ways: through written summaries, diagrams, and tables as well as by focusing on the statistical significance of the change that took place.

#### **6.4.1 Verbal communication**

Personal growth.com (2006) states that verbal communication involves “words, vocabulary, number and symbols and is organized in sentences using language”. Verbal communication can be defined as the use of words to communicate with others; it is an oral format rather than written format. The researcher understands verbal communication to involve speech, comprehension and expression, using vocabulary, as well as tone of voice and clarity of communication.

Verbal communication can be considered one of the core negative factors of an individual's life that is challenged when the diagnosis of autism is made. This comment is clarified by Autism and Pervasive Developmental Disorder Fact Sheet (2002), where it is stated that “Autism is a neurological disorder that is normally evident by the age of three, and affects a child's *ability to communicate, understand language, play, and relate to others*”.

The researcher's goal with this variable was to test the following sub-hypothesis:

- **If autistic children in middle childhood are involved in a play technique programme then their verbal communication skills will improve.**

Based on the in-depth literature study, 11 assessment areas focused on the components of verbal communication were included in the self-constructed measuring instrument (see Addendum C):



- Level of spontaneous speech regarding respondents' needs
- Level of spontaneous speech regarding respondents' feelings
- Comprehensive speech regarding general social interaction
- Comprehensive speech regarding present events within the phase
- Appropriate speech within the phase
- Ability to express comprehension
- Speech when required
- Appropriate use of vocabulary
- Appropriate sentence structure
- Clarity of speech
- Use of tone when speaking

The respondents were given ratings on each assessment area according to a five-point scale.

The researcher will firstly give an overview of the scores achieved by the respondents, through looking at the combined rating that each individual respondent achieved with regard to verbal communication. The focus will then shift onto each individual assessment area as listed previously, looking at the combined pre- and post-test scores achieved by the respondents. Then the researcher will give an overview of the combined scores achieved for each assessment area, highlighting the changes that took place when the pre- and post-test measurements were compared.

It is important to note once again that the ratings given on the five-point scale were counted/scored according to the following distinctions.

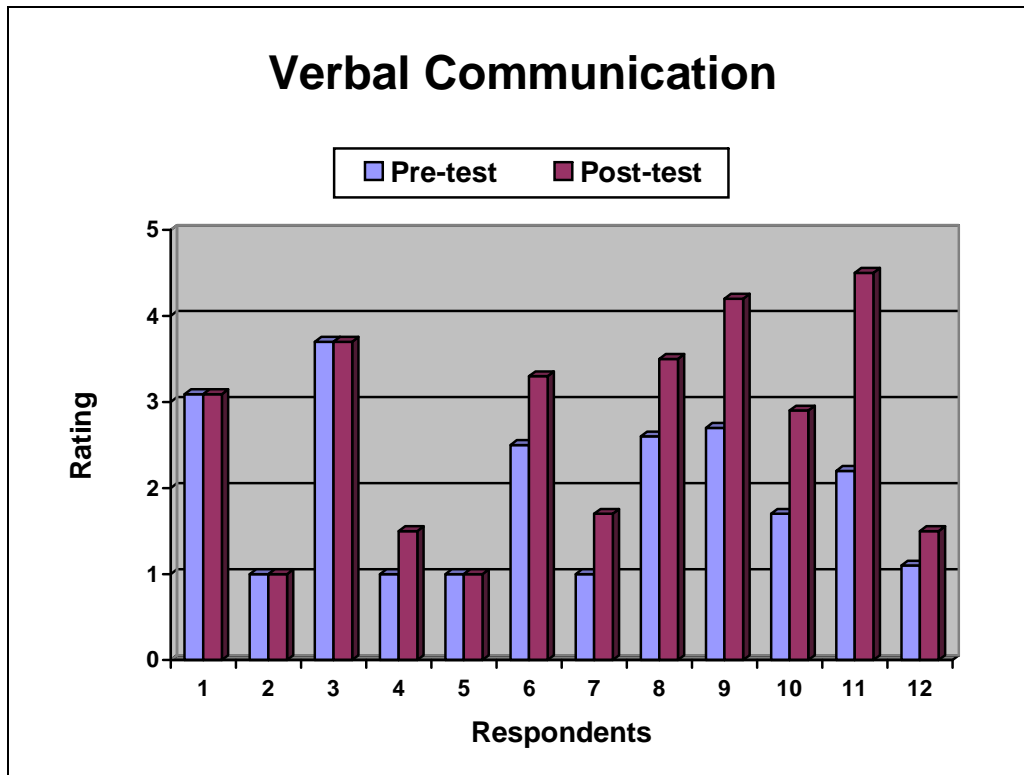
- **1:** Very Poor/Did not appear (no occurrence of the particular behaviour being measured)



- **2:** Poor/To a little extent (behaviour noted on one occasion within the time period of the measurement)
- **3:** Average/To some extent (behaviour noted on two occasions within the time period of the measurement)
- **4:** Good/To a great extent (behaviour noted on three occasions within the time period of the measurement)
- **5:** Very good/Completely (behaviour noted on four or more occasions within the time period of the measurement)

In the following diagram, Diagram 8, one can see the combined pre-test and post-test ratings regarding verbal communication of each respondent. The researcher obtained these scores by combining all the ratings that each individual respondent scored with regard to the 11 assessment areas of verbal communication, both in the pre- and post-test measurements, and then dividing each total score by 11 in order to obtain an average score achieved by each individual. One can clearly note the improvement overall, with these improvements being discussed in detail with regard to each assessment area, after Diagram 8.





**Diagram 8: Pre- and post-test scores for verbal communication for all the respondents individually**

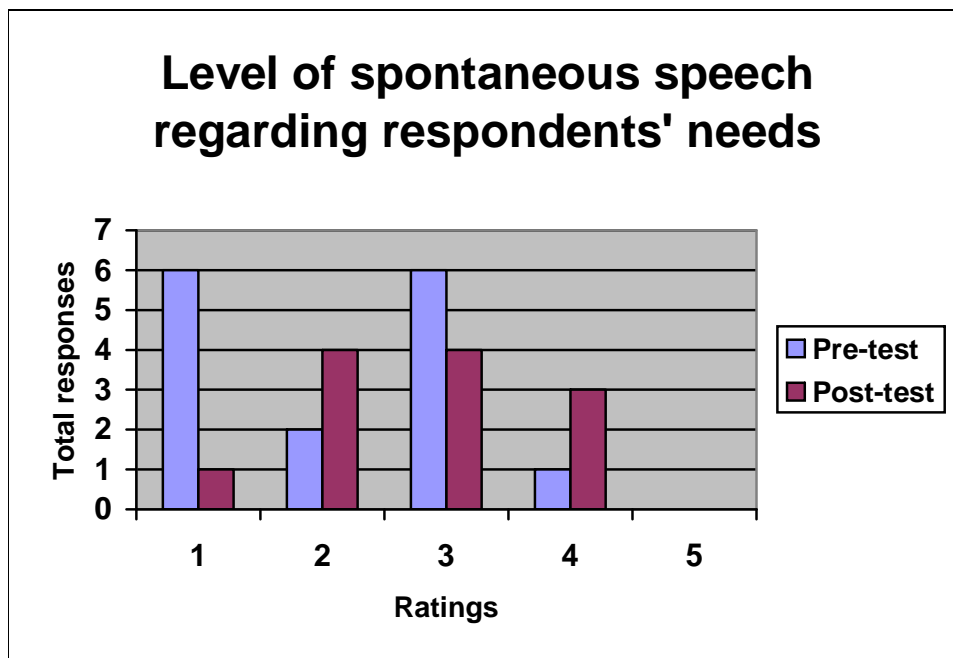
In order to gain a better understanding of these scores, it is important to focus on each assessment area individually. The researcher will now describe each assessment area, discussing the scores achieved in the pre- and post-test measurements, through the use of written information as well as visual displays.

#### 6.4.1.1 Level of spontaneous speech regarding respondents' needs

When looking at the first assessment area with regard to verbal communication, namely the level of spontaneous speech regarding respondents' needs, there is an obvious indication of improvement between the pre- and post-test scores. Spontaneous is defined by the Oxford School Dictionary (2004: 436) as "happening or done naturally; not forced or suggested by someone else".

Therefore spontaneous speech can be understood as the respondent's ability to express his/her needs, within the play phase, through verbal communication automatically, instinctively and in a natural manner.

In the following diagram, Diagram 9, one is able to see the combined scored achieved by the respondents for each specific rating, in the pre- and post-test.



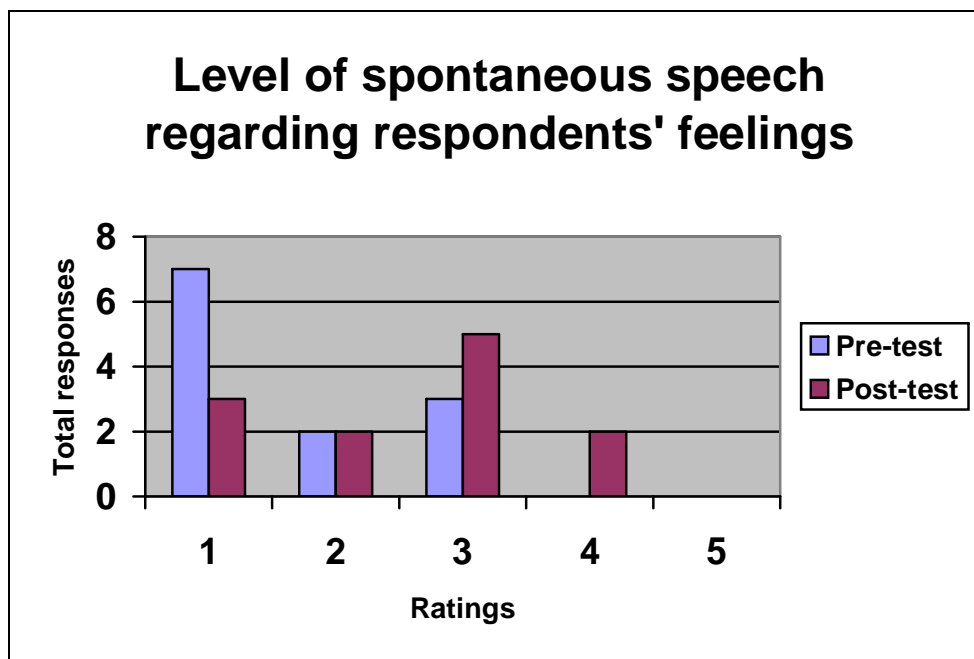
**Diagram 9: Pre- and post-test scores for level of spontaneous speech regarding respondents' needs**

One is clearly able to see the improvement that took place between the pre- and post-test, with a decrease in the number of respondents who achieved a rating of 1 (very poor/did not appear) and an increase in a rating of 4 (good/to a great extent) in the post-test. However, it is important to note that the majority of the scores (66,6%) achieved in the post-test, were a rating of 2 (poor/to a little extent) and/or 3 (average/to some extent), indicating that this particular skill remained a challenge for the respondents.

#### 6.4.1.2 Level of spontaneous speech regarding respondents' feelings

When focusing on the second assessment area, namely “level of spontaneous speech with regard to respondents' feelings”, there was also improvement evident between the pre- and post-test. Referring to the previous definition of spontaneous, on page 185, the researcher understands spontaneous speech with regard to respondents' feelings as the respondents' ability to express their feelings in an automatic, instinctive and natural manner.

The following diagram, Diagram 10, shows the combined rating achieved by the respondents.



**Diagram 10: Pre- and post-test scores for level of spontaneous speech regarding respondents' feelings**

The most noted difference with regard to this assessment area is the fact that in the post-test two (16,6%) of the respondents were able to achieve a

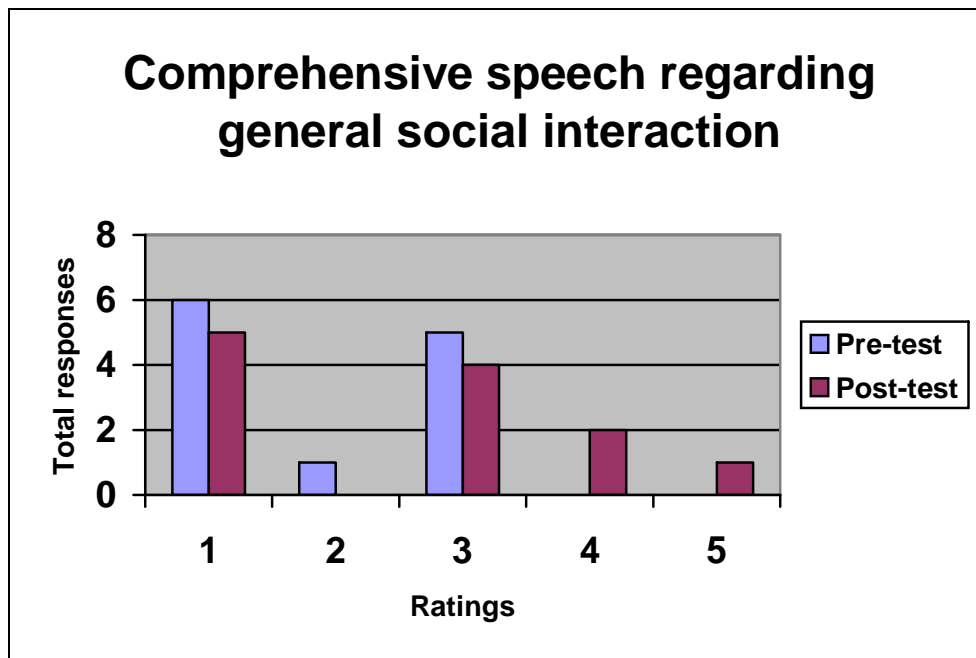


rating of 4 (good/to a great extent). Another noticeable difference is the decrease in the number of respondents who achieved a rating of 1 (very poor/did not appear) in the post-test, with seven respondents (58,3%) achieving this in the pre-test and only three respondents (25%) obtaining this score in the post-test.

#### 6.4.1.3 Comprehensive speech regarding general social interaction

The third communication assessment area measured was the level of “comprehensive speech regarding general social interaction”. Comprehensive is defined as “understandable” (Oxford School Dictionary, 2004: 93). Therefore, comprehensive speech can be understood as the respondents’ ability to indicate understanding of the general social interaction that was taking place within the play technique phase.

Diagram 11 gives a visual presentation of the pre- and post-test scores achieved by the respondents.



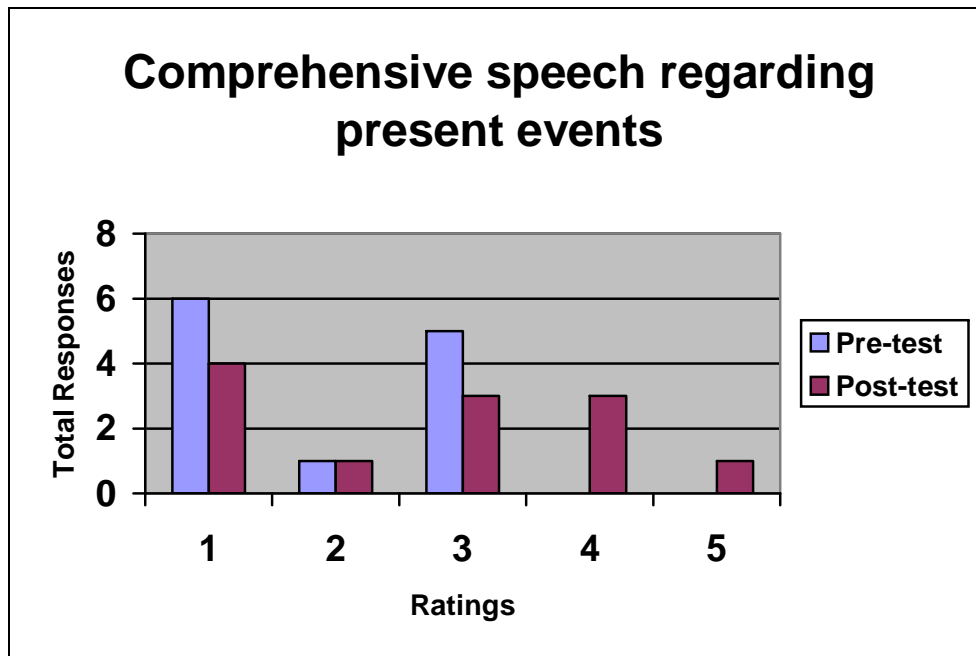
**Diagram 11: Pre- and post-test scores for comprehensive speech regarding general social interaction**

With regard to this skill, five (41,6%) of the respondents achieved a rating of 1 (very poor/did not appear) in the post-test, highlighting the difficulty that remained for the respondents with regard to comprehensive speech. However, it was positive to see that two (16,6%) of the respondents managed to achieve a 4 (good/to a great extent) and one (8,3%) of the respondents was able to achieve a rating 5 (very good/completely) in the post-test showing a good level of improvement.

#### 6.4.1.4 Comprehensive speech regarding present events

The fourth communication assessment area was that of “comprehensive speech regarding present events in the phase”. This assessment area can be understood, based on the previous definition given for comprehensive, as the respondents’ ability to communicate verbally, showing an understanding of the present events in the play technique phase.

Again, one is able to see the improvement that has taken place, particularly when looking at the following diagram (Diagram 12).



**Diagram 12: Pre- and post-test scores for comprehensive speech regarding present events**

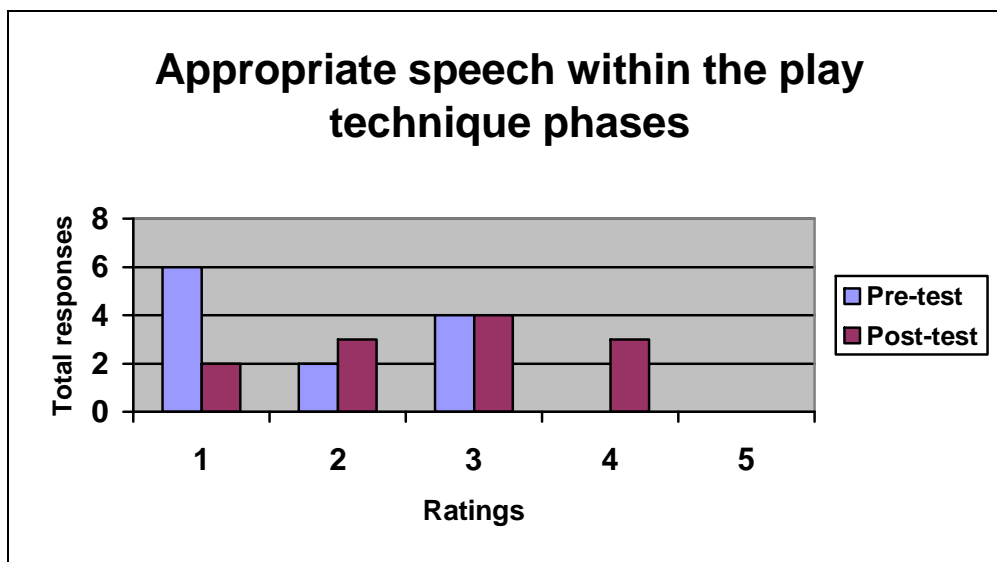
The most noticeable difference can be seen in the number of respondents who were able to achieve a rating of 4 (good/to a great extent) and 5 (very good/completely) in the post-test, with the total equaling four respondents (33,3%), whereas in the pre-test none of the respondents were able to achieve either of these ratings.

It is important once again to mention that communication is a challenge for individuals who are diagnosed on the autism spectrum. This can be verified by the comment given by Stone (2006: 12): “a child diagnosed with autism will show atypical development in three primary areas: (1) social skills, (2) *language and communication skills*, and (3) repetitive and restricted behaviors”.

#### 6.4.1.5 Appropriate speech within the phases

The fifth assessment area focused on was that of “appropriate speech within the phases”. Appropriate can be understood as “suitable” (Oxford School Dictionary, 2004: 22). Therefore this assessment area can be understood as the respondents’ ability to engage in suitable verbal communication within the play technique phase.

This difficulty that the respondents experienced can be noted in relation to this specific skill, as Diagram 13 indicates. In the pre-test six (50%) of the respondents received a rating of 1 (very poor/did not appear), with two (16,6%) receiving a rating of 2 (Poor/to a little extent) and four (33,3%) receiving a rating of 3 (average/to some extent).



**Diagram 13: Pre- and post-test scores for appropriate speech within the play technique phase**

However, improvement was still evident, with the majority of the respondents (59%) achieving a rating of either a 3 (average/to some extent) or a 4 (good/to a great extent) in the post-test.

#### 6.4.1.6 The ability to express comprehension

The next communication assessment area, assessment area 6, was “the ability to express comprehension”. The Oxford School Dictionary (2004:1) defines ability as “being able” whereas comprehension is defined as “understandable” (Oxford School Dictionary, 2004: 93). Therefore this assessment area can be understood as the respondents being able to express/show understanding.

Diagram 14 portrays the ratings achieved by the respondents in the pre- and post-test.

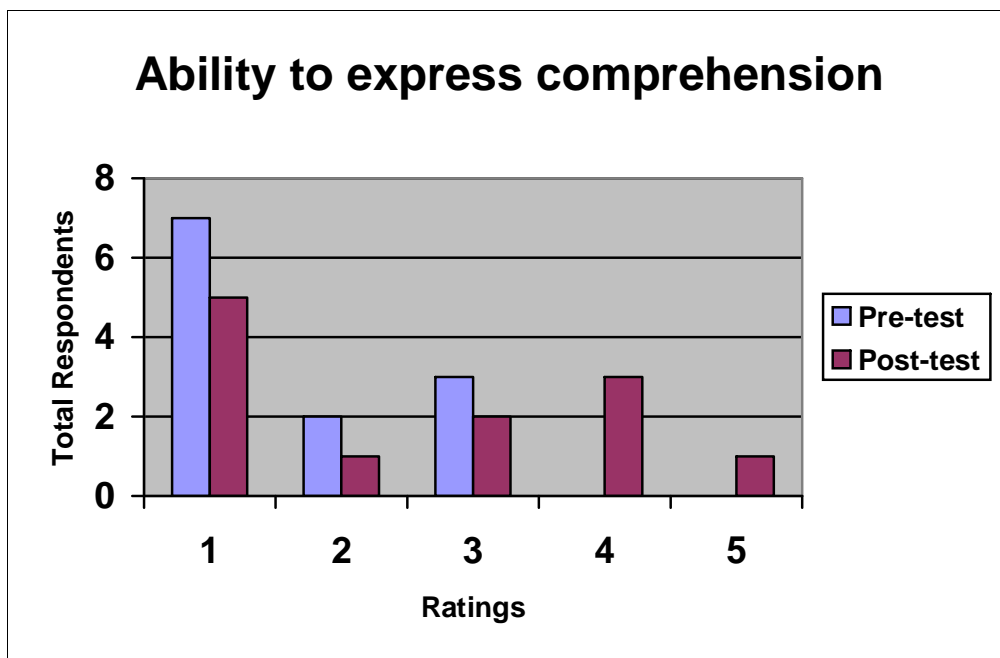


Diagram 14: Pre- and post-test scores for ability to express comprehension





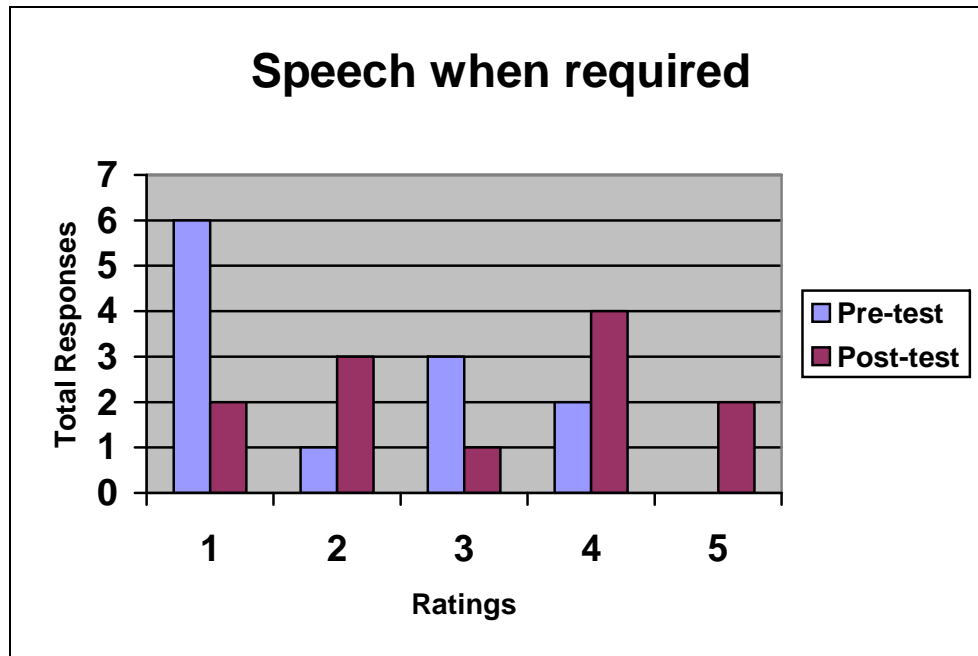
It is very noticeable that a large number of respondents achieved a rating of 1 (very poor/did not achieve) in the pre-test, with seven respondents (58,3%) achieving this. It is also noticeable that once again none of the respondents was able to achieve a rating of either 4 (good/to a great extent) or 5 (very good/completely) in the pre-test.

When completing the post-test one can clearly see the improvement that has taken place, with a decrease in ratings of 1 (very poor/did not appear), 2 (poor/to a little extent) and 3 (average/to some extent), and the presence of the ratings of 4 (good/to a great extent) and 5 (very good/completely), with three respondents (25%) achieving this in the post-test.

#### 6.4.1.7 Speech when required

“Speech when required” was the seventh assessment area measured, when focusing on verbal communication. This assessment area can be understood as the respondents’ ability to communicate verbally when asked or encouraged within the phase. This can often be through answering a question or responding to a verbal request.

Diagram 15 shows the scores achieved in the pre- and post- test.



**Diagram 15: Pre- and post-test scores achieved for speech when required**

Again, one can immediately notice the high percentage of respondents (50%) who received a rating of 1 (very poor/did not appear) in the pre-test. This is also the area that showed the greatest degree of improvement, with only 16,6% of the respondents achieving a rating of 1 in the post-test.

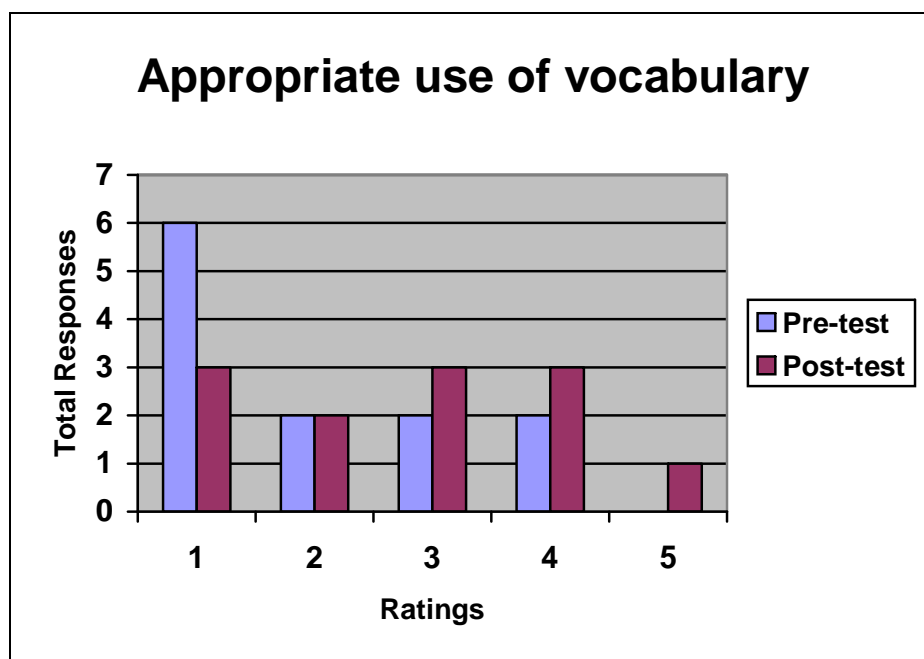
There was also a positive improvement with regard to a rating of 4 (good/to a great extent), with four respondents (33,3%) achieving this in the post test, as opposed to two respondents (16,6%) in the pre-test; and an improvement with a rating of 5 (very good/completely) with no respondents achieving this in the pre-test and two respondents (16,6%) achieving this in the post-test.

#### 6.4.1.8 Appropriate use of vocabulary

“Appropriate use of vocabulary” was the eighth area of assessment with regard to verbal communication. Vocabulary is defined as “a list of words with their meanings” (Oxford School Dictionary, 2004: 508). As has been previously stated,

the language used in the phases was English, as this is the researcher's first language and the language that is used at The Key School for Specialized Education. This area of assessment therefore focused on the respondents' ability to use appropriate/suitable words in communicating.

In the following diagram, Diagram 16, it is possible to see once again the improvement that took place between the pre- and post-test.



**Diagram 16: Pre- and post-test scores for appropriate use of vocabulary**

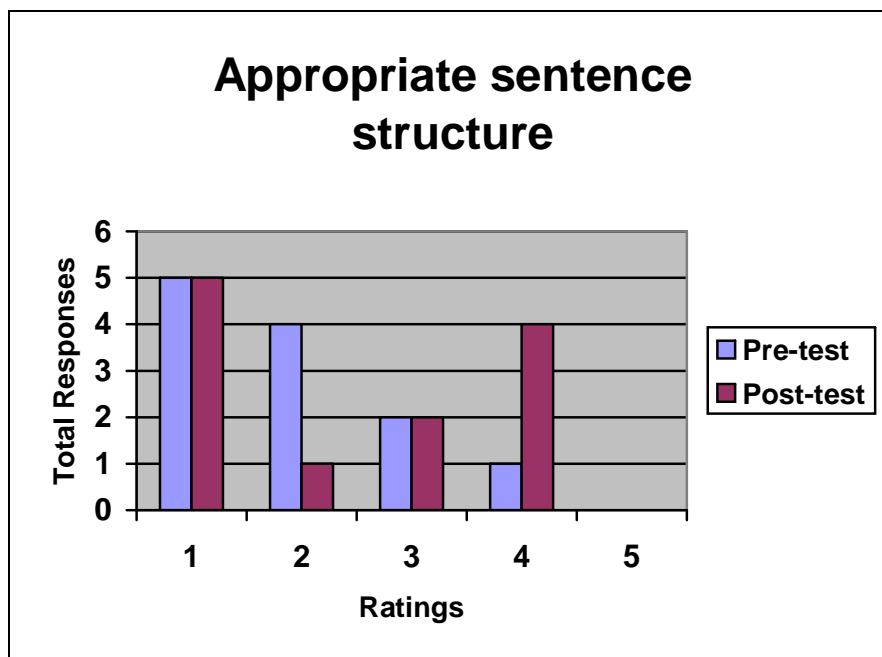
The most noticeable improvement that took place is the great decrease in the number of respondents who achieved a rating of 1 (very poor/ did not appear), with six respondents (50%) obtaining this in the pre-test and only three respondents (25%) obtaining this in the post-test.

The increase in the ratings of 3 (average/to some extent), 4 (good/to a great extent) and 5 (very good/completely) is also noticeable, although only one

respondent (8,3%) was able to obtain a rating of 5, therefore highlighting the intractable difficulty of this skill for the respondents.

#### 6.4.1.9 Appropriate sentence structure

The ninth area of assessment with regard to verbal communication is that of “appropriate sentence structure”. The researcher understands this as the respondents’ ability to use the correct word order and vocabulary when speaking. The scores achieved can be seen in Diagram 17.



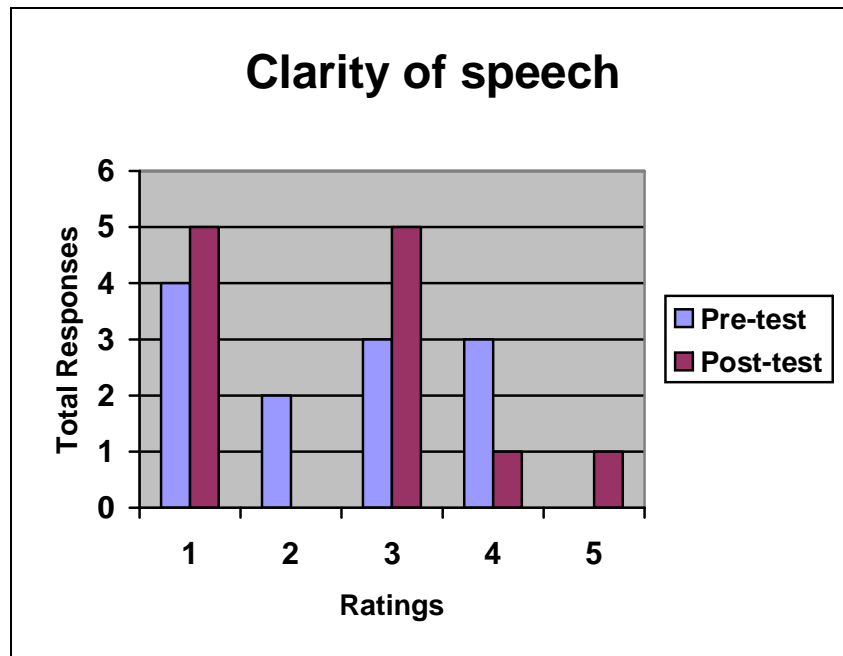
**Diagram 17: Pre- and post-test scores for appropriate sentence structure**

The improvement that took place with regard to this skill is most noticeable with the increase in the number of respondents who managed to achieve a rating of 4 (good/to a great extent), with four respondents (33,3%) achieving this in the post-test and only one respondent achieving this in the pre-test.

However, it is also noticeable that a large percentage (42%) of the respondents achieved a rating of 1 (very poor/did not appear) in both the pre- and post-test, highlighting the fact that this skill remained a difficulty for some of the respondents.

#### 6.4.1.10 Clarity of speech

The tenths assessment area was that of “clarity of speech”. Clarity can be understood as “clearness” (Oxford School Dictionary, 2004: 82). Therefore this assessment area focused on the respondents’ ability to speak/talk clearly. The following diagram, Diagram 18, gives the pre- and post-test scores achieved.



**Diagram 18: Pre- and post-test scores for Clarity of Speech**

In this particular assessment area an average ability was shown in the pre-test, with the respondents coping adequately with this skill. However, there were still 50% of the respondents who battled with the skill, with four respondents (33,3%)



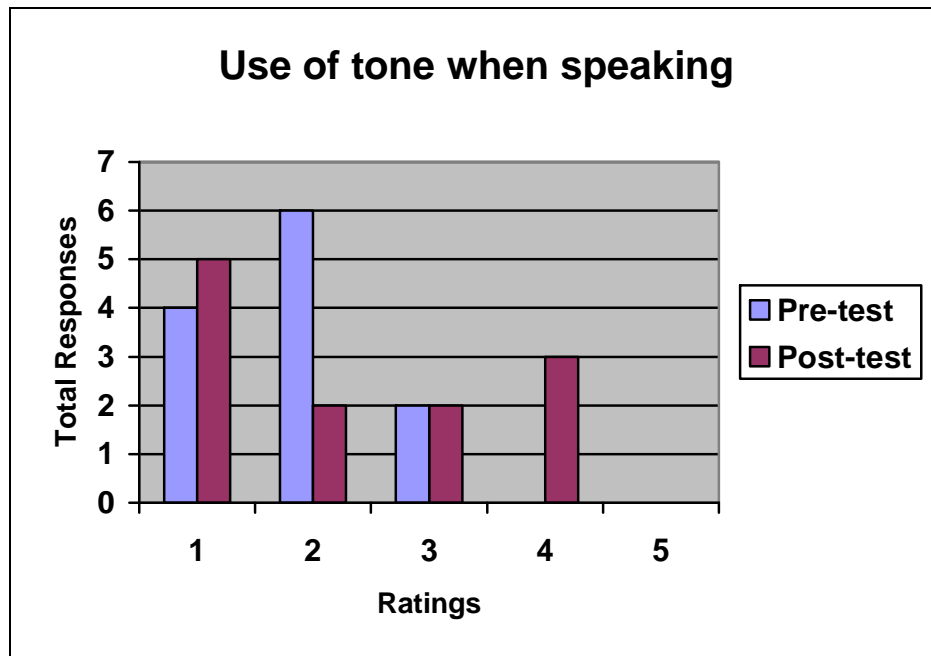
receiving a rating of 1 (very poor/did not appear) and two respondents (16,6%) obtaining a rating of 2 (Poor/to a little extent) in the pre-test.

There was improvement evident in the post-test, although the majority of the improvement took place with regard to the rating of 3 (Average/to some extent), with 5 respondents (41,6%) achieving this in the post-test. This highlights the point that this skill remains a challenge for the respondents, although it is possible for this skill to be developed and improved. It is also important to note that although improvement can be seen with regard to this behaviour the respondents did still have difficulty with this skill and this can be confirmed by the increase of the rating of 1 (very poor/did not appear) in the post-test.

#### 6.4.1.11 Use of tone when speaking

The final assessment area with regard to verbal communication was that of “use of tone when speaking”. Improving Verbal Communication (2006) states “words can be considered to contribute 7% to the conversation; tone of voice 38% and non-verbal cues 55%”. This highlights the importance of tone in conversing with others. Tone is defined as the “give a particular tone of sound” (Oxford School Dictionary, 2004: 477). Therefore, when focusing on this assessment area the researcher was observing the respondents’ ability to use tone to communicate/express emotion.

Diagram 19 shows the pre- and post-test scores achieved by the respondents with regard to this skill.



**Diagram 19: Pre- and post-test scores for use of tone when speaking**

Diagram 19 shows that improvement did take place when the post-test scores were measured, particularly with regard to a rating of 4 (good/to a great extent), with 3 respondents (25%) achieving this in the post-test, as opposed to no respondents in the pre-test. However, 50% of the respondents achieved a rating of 2 (poor/to a little extent) and 33.3% a rating of 1 in the pre-test, indicating the challenge that this skill remains for the respondents.

In the table below, Table 9, the researcher has calculated the total number of responses, from all the respondents, for each specific rating (namely Very Poor/did not appear; Poor/to a little extent; Average/to some extent; Good/ to a great extent; Very good/Completely), according to each assessment area focused on. These have been calculated for both the pre- and post-test scores, in order to highlight the comparison between these scores.

For example, when focusing on the first assessment area with regard to verbal communication, namely “level of spontaneous speech regarding his/her (the



child's) needs", the researcher has combined the number of times all the respondents have received a rating of 1 (Very poor/did not appear) in both the pre-test and the post-test scoring.

For example, six respondents received a rating of 1 in the pre-test, indicating a lack of ability with regard to this skill. In the post-test only one respondent received a rating of 1, indicating an improvement in this skill.

The researcher has then completed the same step with regard to each rating, relating to each assessment area, focusing on both the pre- and post-test scores achieved. The researcher has done this with each specific social behavioural element, namely verbal communication, non-verbal communication, social interaction and challenging behaviour.

To give a summary of all the scores achieved with regard to verbal communication, the following frequency distribution was compiled in Table 9. Table 9 presents a frequency distribution of the respondents' combined ratings according to their verbal communication capabilities, by utilizing a pre-test and post-test.



**Table 9: Frequency distribution of the respondents' Verbal Communication ratings**

Assessment Areas	VERBAL COMMUNICATION									
	Pre-Test					Post-Test				
	Very poor/ did not appear	Poor/ to a little extent	Average/ to some extent	Good/ to a great extent	Very good/ completely	Very poor/ did not appear	Poor/ to a little extent	Average/ to some extent	Good/ to a great extent	Very good/ completely
Level of spontaneous speech regarding his/her needs	6	2	3	1	-	1	4	4	3	-
Level of spontaneous speech regarding his/her feelings	7	2	3	-	-	3	2	5	2	-
Comprehensive speech regarding general social interaction	6	1	5	-	-	5	-	4	2	1
Comprehensive speech regarding present events within the phase	6	1	5	-	-	4	1	3	3	1
Appropriate speech within the phase	6	2	4	-	-	2	3	4	3	-
Ability to express comprehension	7	2	3	-	-	5	1	2	3	1
Speech when required	6	1	3	2	-	2	3	1	4	2
Appropriate use of vocabulary	6	2	2	2	-	3	2	3	3	1
Appropriate sentence structure	5	4	2	1	-	5	1	2	4	-
Clarity of speech	4	2	3	3	-	5	-	5	1	1
Use of tone when speaking	4	6	2	-	-	5	2	2	3	-
<b>Total</b>	<b>63</b>	<b>25</b>	<b>35</b>	<b>9</b>	<b>0</b>	<b>40</b>	<b>19</b>	<b>35</b>	<b>31</b>	<b>7</b>

The overall significance of the ratings achieved with regard to verbal communication, when looking at the total scores achieved, can be summarized as follows:



- There was an overall improvement with regard to the respondents' verbal communication skills, with a decrease in ratings 1 (very poor/did not achieve), 2 (poor/to a little extent) and an increase in ratings 4 (good/to a great extent) and 5 (very good/completely). This can be seen in Table 10.

**Table 10: Verbal communication ratings**

Rating	Pre-test	Post-test
1	63	40
2	25	19
3	35	35
4	9	31
5	0	7

- In the pre-test, the highest score achieved was for the rating of 1 (very poor/did not achieve) with 47,7% of the responses being marked in this category and no respondents achieved a rating of 5 (very good/completely); highlighting the difficulties that children who are diagnosed with autism have with verbal communication. The percentages are achieved through using the total score achieved within each rating and dividing this by the total responses recorded for verbal communication, namely 132 (11 assessment areas times by 12 respondents).
- In the post-test one can clearly see that the greatest increase was in the ratings of 4 (good/to a great extent) and 5 (very good/completely), with an increase of 22 and 7 responses respectively. This indicates a positive improvement in the respondents' verbal communication skills.
- However, it is still important to note that a fair percentage (71,2%) of the respondents scored a rating of 1 (very poor/did not achieve), 2 (poor/to a little extent), and/or 3 (average/to some extent) in the post-test, highlighting the point that verbal communication can be considered an intractable challenge for autistic children.



Table 11 shows the median scores for respondents' verbal communication ratings in the pre- and post-test.

This table shows the median, the minimum and maximum scores, the Interquartile deviation and the range for all respondents combined in each class, in the pre- and post-test. As previously mentioned, the respondents were taken from the various classes at The Key School for Specialized Education, which are divided according to developmental age. This is how the respondents have been divided in this table, with class 1 representing the children on the lowest developmental age at the school and class 4 representing the children on the highest development age at the school.

The median can be defined as the middle value of an ordered set of scores, which does not depend on all the scores and is therefore not affected by extreme values. The value of the median might not belong to the set of scores (De Vos, Fouché & Venter, 2002: 237).

The Interquartile deviation/range can be defined as "the difference between the score representing the 75<sup>th</sup> percentile and the score representing the 25<sup>th</sup> percentile" (Statistical Indices of Data Variability, 2007). The Interquartile range is "calculated by subtracting the 25<sup>th</sup>% value from the 75<sup>th</sup>% value and is based around the median" (National Water Quality Laboratory Technical Memorandum, 2007).

The range can be defined as "the difference between the largest and smallest measurements of the raw scores" (De Vos, Fouché & Venter, 2002: 237). The minimum and maximum scores are also shown, with these referring to the combined minimum and maximum scores achieved by the respondents.

**Table 11: Median scores of respondents' ratings with regard to Verbal Communication.**

Class		1	2	3	4
Number of respondents		3	2	2	5
Median	Pre-Test	1.1818182	2.1818182	1.0000000	2.5454545
	Post-Test	1.4545455	2.4090909	1.227227	3.5454545
Minimum	Pre-Test	1.0000000	1.0000000	1.0000000	1.3636364
	Post-Test	1.0000000	1.4545455	1.0909091	2.9090909
Maximum	Pre-Test	3.0909091	3.3636364	1.0000000	2.7272727
	Post-Test	3.0909091	3.3636364	1.3636364	4.5454545
Interquartile deviation	Pre-Test	1.045455	1.18182	0	0.22727
	Post-Test	1.045455	0.954545	0.136365	0.272725
Range	Pre-Test	2.0909091	2.3636364	0	1.3636364
	Post-Test	2.0909091	1.9090909	0.2727273	1.6363636

The Wilcoxon Signed-Rank Test for a Paired Experiment (Wackerly, Mendenhall & Scheaffer, 2002) was used to test the statistical significance of these results. The test criterion on a 1% level of significance allows for the null hypothesis to be rejected if the p-value is less than ( $<$ ) 0.01. The null hypothesis ( $H_0$ ) states that the intervention had no effect. The alternative hypothesis ( $H_1$ ) states that the intervention did have an effect.



With regard to verbal communication the following results are yielded by the Wilcoxon Signed-Rank Test for a Paired Experiment. The test statistic given is 0.0 and the p-value is 0.00195, therefore leading to the following conclusion:

- 0.00195 is less than 0.01%, which is considered the level of significance;
- Therefore the null hypothesis is rejected;
- The alternative hypothesis is accepted;
- This allows the conclusion that the intervention (the play technique programme) had a highly significant effect on the verbal communication of the respondents.

#### **6.4.2 Non-verbal communication**

BBC Teaching English (2006) consider the following to be components of non-verbal communication: Body language; Use of space; Touch; Eye contact; Use of time; Tone of voice; Use of silence; Position of the body; and Attentiveness/listening.

Non-verbal communication can be considered another element of social behaviour that autistic individuals are challenged with on a daily basis. This can be seen in the statement made by Stone (2006: 12), who notes that a child diagnosed with autism will show “atypical development in three primary areas: (1) social skills, (2) language and communication skills, and (3) repetitive and restricted behaviors”.

The researcher’s goal within this variable was to test the following sub-hypothesis:



- **If autistic children in middle childhood are involved in a play technique programme then their non-verbal communication skills will improve.**

Based on the in-depth literature study, the following 11 assessment areas of non-verbal communication were included in the self-constructed measuring instrument (see Addendum C):

- Facial expressions, for the purpose of communication
- Gestures
- Appropriate use of personal space
- Eye contact
- Interest in listening to the researcher
- Appropriate use of silence
- Level of appropriate response to listening
- Ability to focus
- Concentration span
- Attentiveness
- Openness to researcher

The researcher will firstly give an overview of the scores achieved by the respondents, through looking at the combined rating that each individual respondent achieved with regard to non-verbal communication. The focus will then shift to each individual assessment area as listed previously, looking at the combined pre- and post-test scores achieved by the respondents. Then the researcher will give an overview of the combined scores achieved for each assessment area, highlighting the changes that took place when the pre- and post-test measurements were compared.

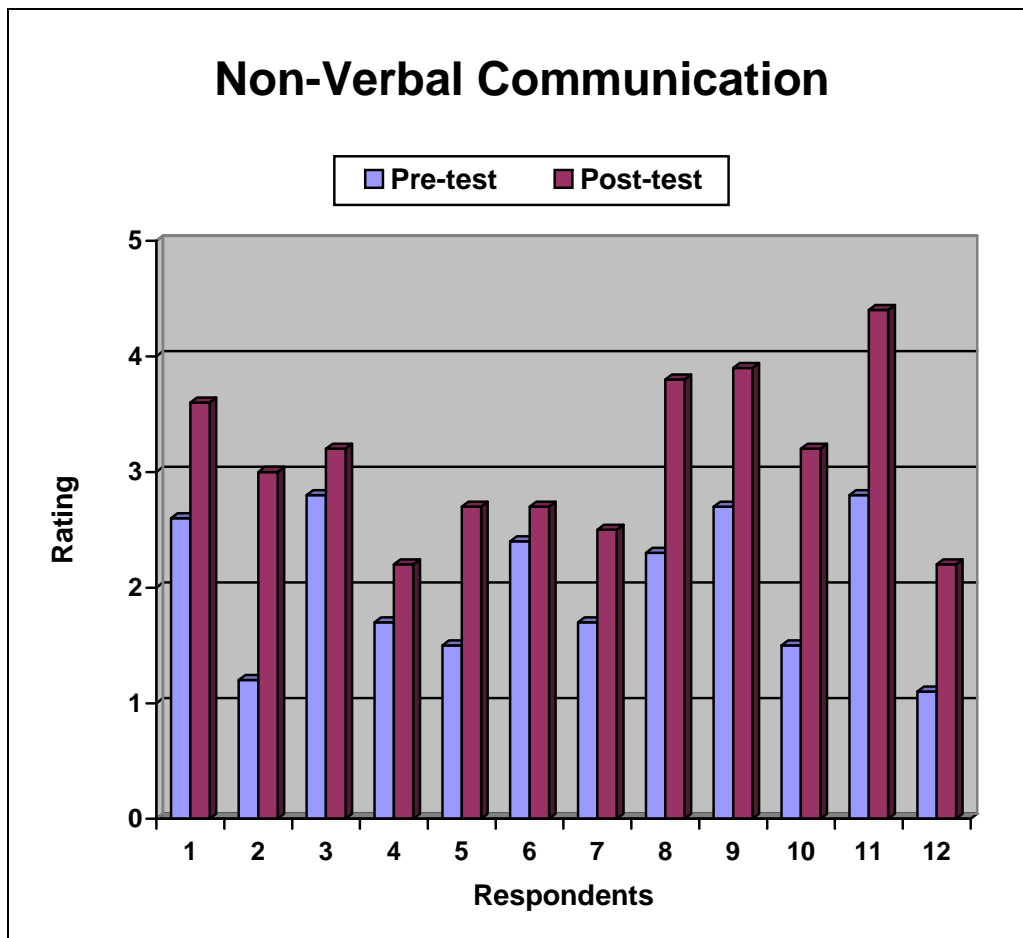
It is important to note once again that the ratings given on the five-point scale were counted/scored according to the following distinctions:



- **1:** Very Poor/Did not appear (no occurrence of the particular behaviour being measured)
- **2:** Poor/To a little extent (behaviour noted on one occasion within the time period of the measurement)
- **3:** Average/To some extent (behaviour noted on two occasions within the time period of the measurement)
- **4:** Good/ To a great extent (behaviour noted on three occasions within the time period of the measurement)
- **5:** Very good/Completely (behaviour noted on four or more occasions within the time period of the measurement)

In Diagram 20, the researcher gives an indication of the pre- and post-test scores of each respondent individually, with regard to non-verbal communication skills.

The researcher obtained these scores by combining all the ratings that each individual respondent scored with regard to the 11 assessment areas of non-verbal communication, both in the pre- and post-test measurements, and then dividing each total score by 11 in order to arrive at an average score achieved by each individual.



**Diagram 20: Pre- and post-test scores for non-verbal communication of all the respondents**

All the respondents reflected improvement once the play technique programme was implemented.

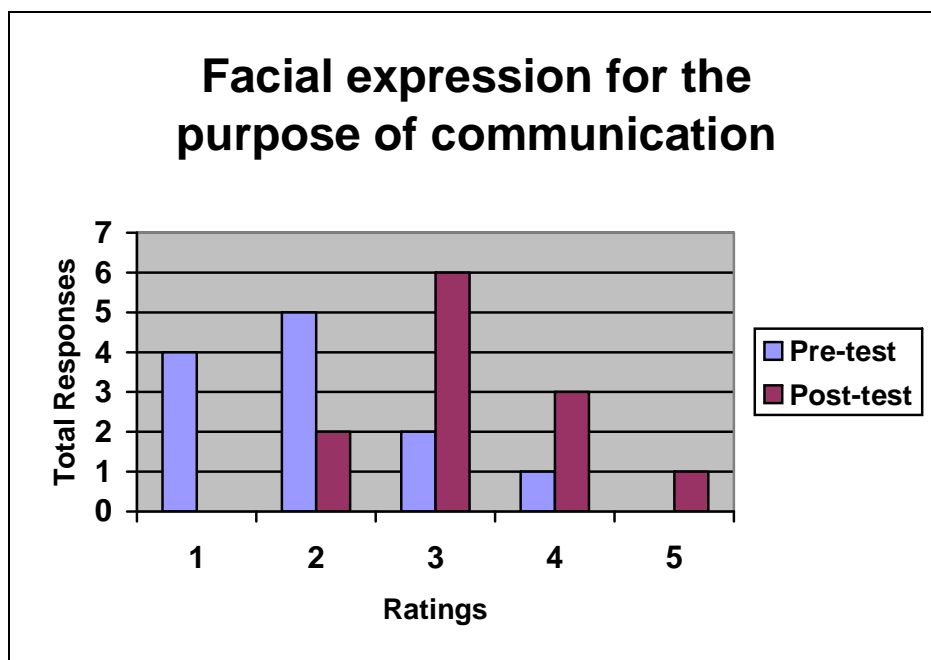
In order to gain a better understanding of Diagram 20 and the statistics given, the researcher will now focus on each assessment area individually.



#### 6.4.2.1 Facial expression for the purpose of communication

The first assessment area focused on, with regard to non-verbal communication, is that of “facial expression for the purpose of communication”. Expression is defined as “the look on a person’s face that shows his or her feelings” (Oxford School Dictionary, 2004: 163). Therefore, according to the researcher, facial expression can be understood as the respondents’ ability to show/use facial symbols to communicate a message.

Diagram 21 shows the scores the respondents achieved for assessment area 1. One is able to see the improvement that took place.



**Diagram 21: Pre- and post-test scores for facial expression for the purpose of communication**

As can be seen in Diagram 21, the respondents did show a lack of facial expression in the pre-test, with the majority (91,5%) of the respondents receiving



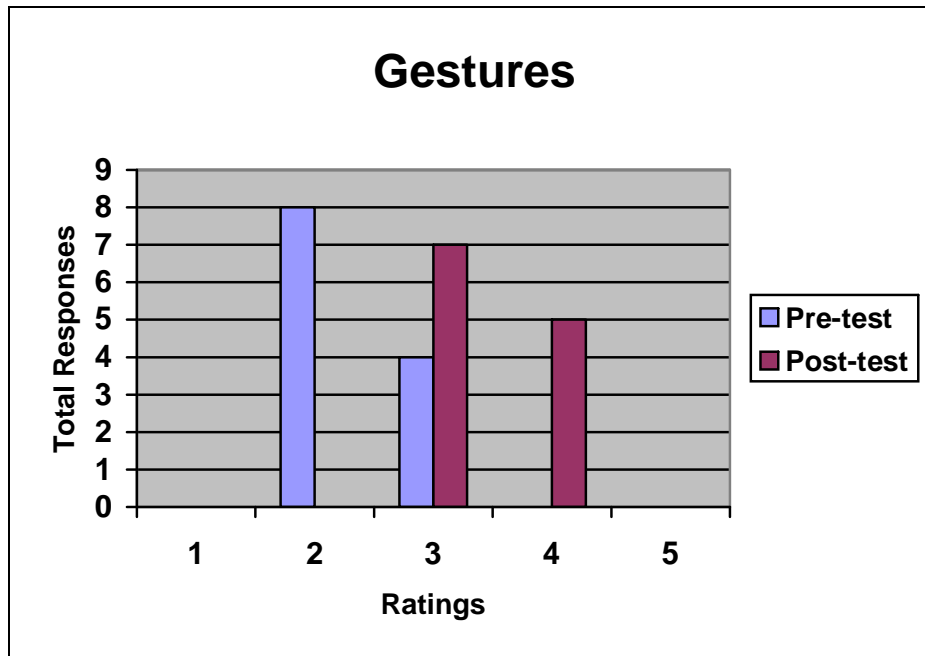
a low rating. A total of four respondents (33,3%) received a rating of 1 (very poor/did not appear); five respondents (41,6%) received a rating of 2 (poor/to a little extent) and two respondents (16,6%) receiving a rating of 3 (average/to some extent). Only one respondent (8,3%) achieved a rating of 4 (good/to a great extent).

In the post-test there was a fair amount of improvement, particularly with regard to a rating of 3 (average/to some extent), with six respondents (50%) obtaining this rating, as opposed to two (16,6%) in the pre-test. It was also positive to see that three respondents (25%) managed to achieve a rating of 4 (good/to a great extent) and one respondent (8,3%) achieved a rating of 5 (very good/completely). Therefore, there was definitely evidence of improvement with regard to the skill of using facial expression as a means of non-verbal communication.

#### 6.4.2.2 Gestures

“Gestures” was the second assessment area, with the respondents experiencing this skill as a challenge in the pre-test. Gestures are defined as “a movement or action that expresses what a person feels” (Oxford School Dictionary, 2004: 193).

The scores achieved by the respondents can be seen in Diagram 22.



**Diagram 22: Pre- and post-test scores for gestures**

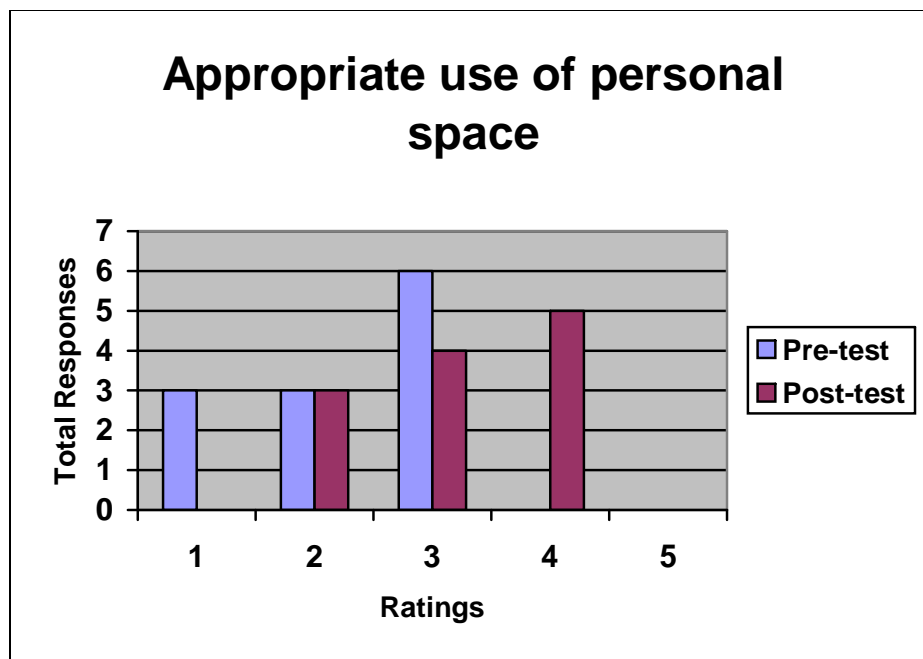
Although none of the respondents received the lowest rating, eight (66,6%) of the respondents received a rating of 2 (poor/to a little extent) in the pre-test. The other four respondents (33,3%) received a 3 (average/to some extent), indicating that the skill was still a challenge for the respondents.

Once the play technique programme had been conducted and the post-test was completed, it was clear that progress had taken place. This is mainly evident in the increase in the number of respondents who obtained a rating of 3 (average/to some extent), with seven respondents (58,3%) achieving this. It was also positive to see that five (41,6%) of the respondents managed to achieve a rating of 4 (good/to a great extent), showing a vast improvement in this particular skill.

### 6.4.2.3 Appropriate use of personal space

The next assessment area was “appropriate use of personal space”, focusing on this as a non-verbal communication skill. Personal space can be understood as one’s own, private physical space around the individual’s person (Oxford School Dictionary, 331). Based on the researcher’s experience with autistic children it was important to assess the respondents’ ability to respect others’ personal space – to assess, in other words, whether they did not get too close, as well as whether they were able to come into another person’s space at all. Therefore both extremes had to be considered.

The following diagram, Diagram 23, shows the pre- and post-test scores for this assessment area.



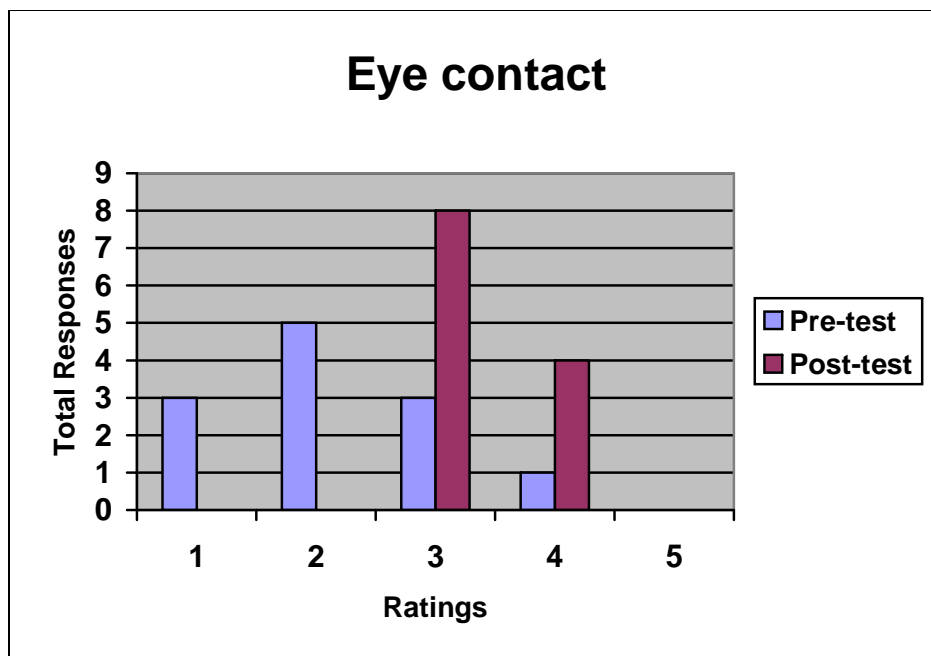
**Diagram 23: Pre- and post-test scores for appropriate use of personal space**

Again the improvement between the pre- and post-test scores is evident, particularly with the high incidence of a rating of 4 (Good/to a great extent) in the post-test, with five respondents (41,6%) achieving this in the post-test as opposed to 0 in the pre-test. None of the respondents achieved a rating of 1 (very poor/did not appear) in the post-test, indicating achievement with regard to this skill.

#### 6.4.2.4 Eye contact

The fourth assessment area was that of “eye contact”. Eye contact is defined as the “condition/state of touching, meeting or communicating” (Oxford School Dictionary, 2004: 99).

Diagram 24 shows the pre- and post-test scores for this assessment area.



**Diagram 24: Pre- and post-test scores for eye contact**

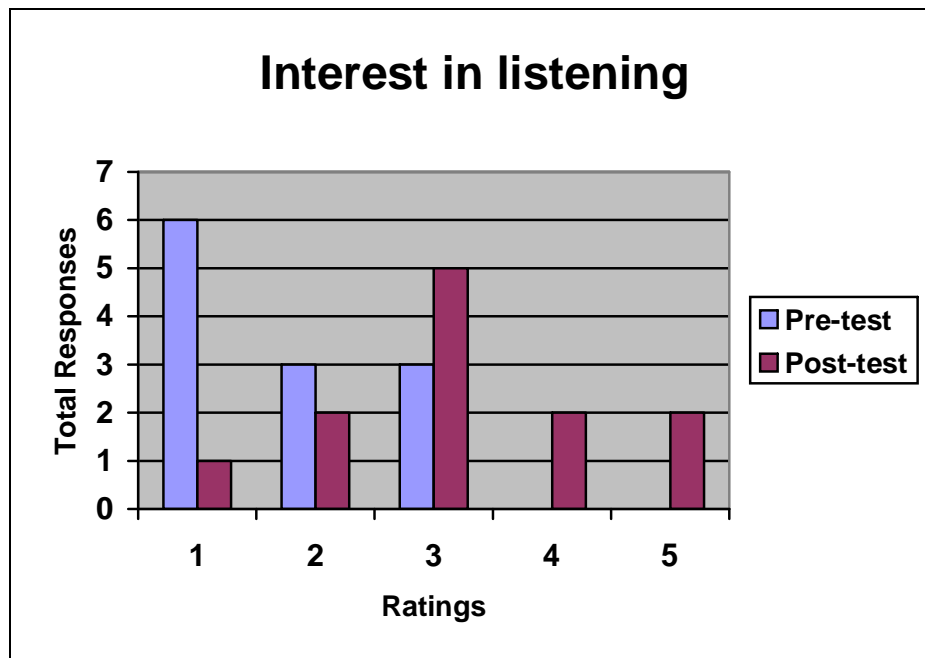


Diagram 24 shows the improvement that took place: none of the respondents obtained a rating of 1 (very poor/did not appear) or 2 (poor/to a little extent) in the post-test in comparison with the pre-test when three respondents (25%) received a rating of 1 (very poor/did not appear) and five respondents (41,6%) achieved a rating of 2 (poor/to a little extent).

A total of four respondents (33,3%) managed to obtain a rating of 4 (good/ to a great extent) in the post-test. The majority of the respondents achieved a rating of 3 (average/to some extent) in the post-test, with eight respondents (66,6%) given this rating, highlighting the fact that even though there was improvement evident with this skill, it remained a challenge for some of the respondents.

#### 6.4.2.5 Interest in listening

“Interest in listening” was the fifth area assessed with regard to non-verbal communication. This can be understood, according to the researcher, as the respondents’ interest in listening to the verbal and non-verbal communication from the researcher and indicating that they are listening, through non-verbal cues. Diagram 25 shows the scores that were achieved by the respondents.



**Diagram 25: Pre- and post-test scores for interest in listening**

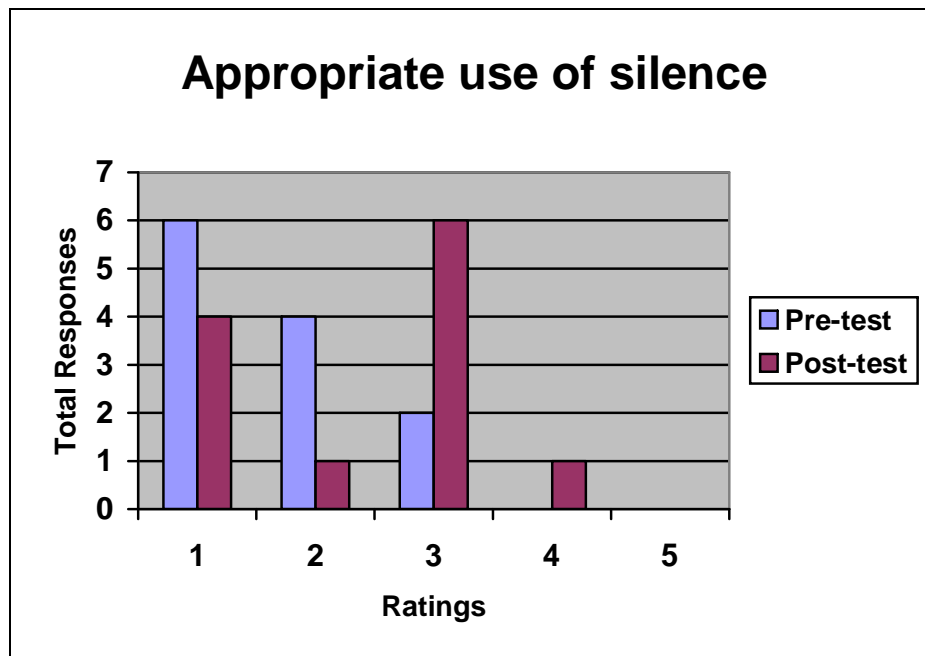
Diagram 25 indicates that the respondents showed a weakness with regard to this skill, as can be seen in the large number of respondents who achieved a rating of 1 (very poor/did not appear), with 50% of the respondents achieving this in the pre-test.

However, once the intervention (the play technique programme) was introduced, there was a great deal of improvement evident. The most noticeable improvement is evident in the fact that two (16,6%) of the respondents obtained a rating of 4 (good/to a great extent) and 5 (very good/completely) respectively, showing an increase of interest in listening.

#### 6.4.2.6 Appropriate use of silence

The sixth skill assessed was that of “appropriate use of silence”. The focus when measuring this skill was to identify whether the respondent was able to engage in suitable moments of silence, in the conversation. It was necessary for the

researcher to identify whether there was a complete lack of silence and/or too much silence in the conversations held. As can be seen in Diagram 26, the respondents showed a lack of ability in this skill in the pre-test. With this skill, as in the previous skill, 50% of the respondents received a rating of 1 (very poor/did not appear) in the pre-test.



**Diagram 26: Pre- and post-test scores for appropriate use of silence**

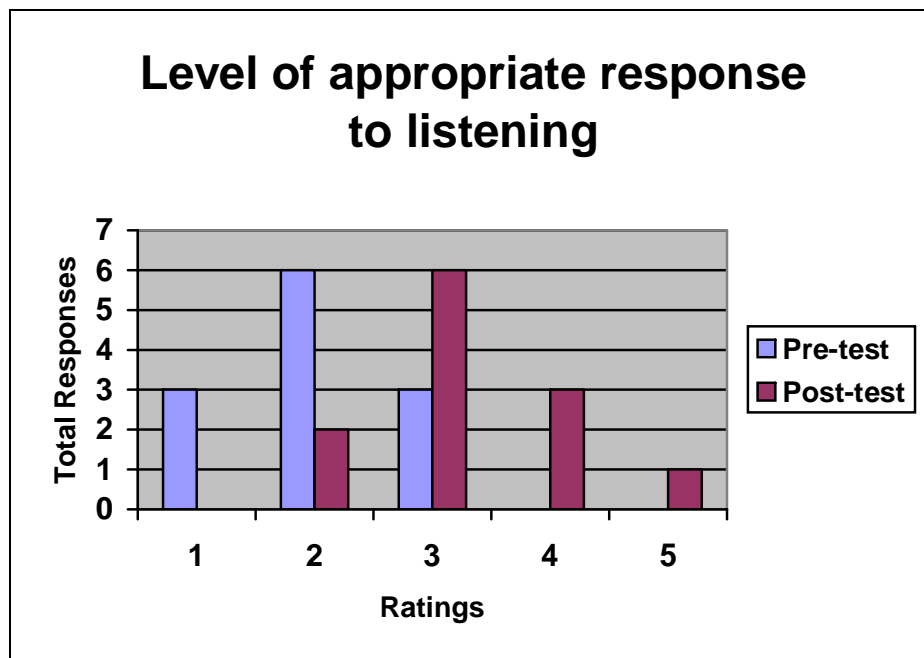
Once the intervention has been implemented, there was improvement evident. The greatest improvement can be seen in the respondents achieving a rating of 3 (Average/to some extent), with 50% of the respondents scoring this. This does indicate an improvement, but it also indicates the fact that this skill can still be considered a challenge for these respondents.

Only one respondent (8,3%) was able to achieve a rating of 4 (good/to some extent) in the post-test, showing achievement with regard to this skill. However, this also indicates that the skill generally remained a challenge for the respondents involved in the study.



#### 6.4.2.7 Level of appropriate response to listening

The next skill assessed was that of “level of appropriate response to listening”. Again, the researcher was measuring the respondents’ suitable response to listening through using non-verbal communication. Diagram 27 shows the scores obtained by the respondents in both the pre- and post-test.



**Diagram 27: Pre-and post-test scores for level of appropriate response to listening**

The respondents showed limited ability with this skill when the pre-test was conducted. This is demonstrated by the fact that three (25%) obtained a rating of 1 (very poor/did not achieve), six (50%) achieved a rating of 2 (poor/to a little extent) and a further three respondents (25%) obtaining a rating of 3 (average/to some extent).

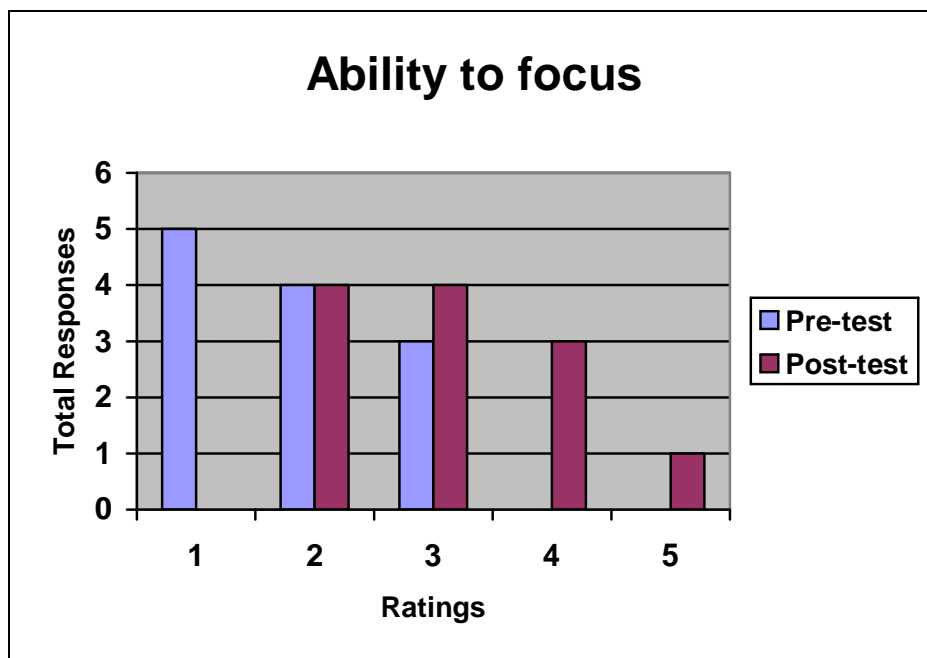
When the post-test was conducted a noticeable improvement was evident. A total of three respondents (25%) received a rating of 4 (good/to a great extent)

and one respondent (8,3%) received a rating of 5 (very good/completely). However, 50% of the respondents were given a rating of 3 (average/to some extent), indicating that the skill remained difficult for some of the respondents.

#### 6.4.2.8 Ability to focus

“Ability to focus” was the eighth area of assessment with regard to non-verbal communication. Focus can be defined as the “concentrate” (Oxford School Dictionary, 2004: 179). Therefore, when observing and measuring this assessment area the researcher was assessing the respondents’ ability to concentrate.

Diagram 28 shows the pre- and post-test scores achieved by the respondents.



**Diagram 28: Pre- and post-test scores for ability to focus**

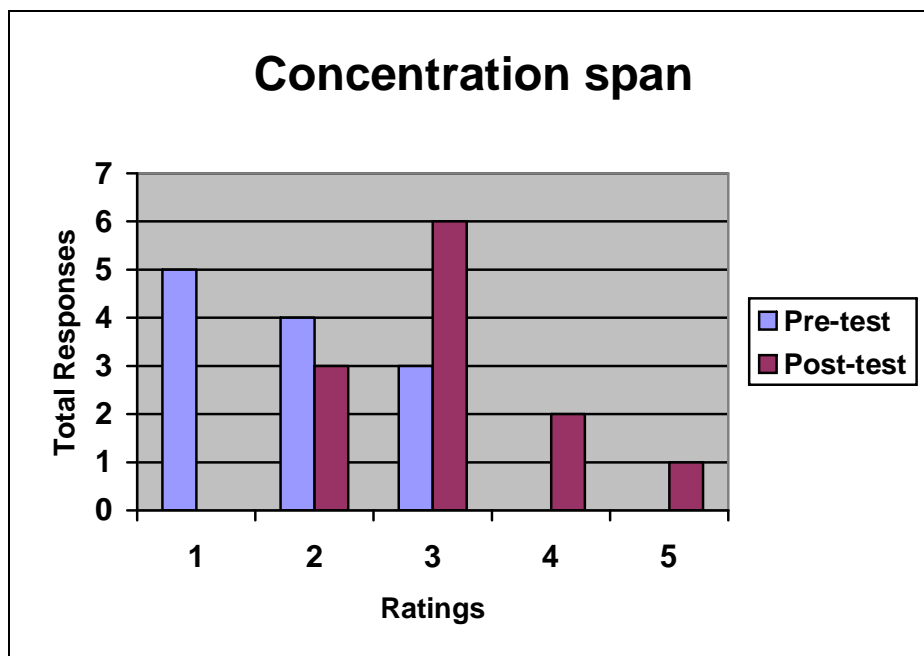
The respondents had difficulty with this skill in the pre-test. This can be seen in the fact that five (41,6%) achieved a rating of 1 (very poor/did not appear); four

(33,3%) obtained a rating of 2 (poor/to a little extent); and three (25%) received a rating of 3 (average/to some extent).

Progress was noted, however, with none of the respondents receiving a rating of 1 (very poor/did not appear) in the post-test. It was also positive to note that three (25%) of the respondents were able to obtain a rating of 4 (good/to a great extent) and one respondent (8,3%) obtained a 5 (very good/completely).

#### 6.4.2.9 Concentration span

“Concentration span” was the next area of assessment. Concentration is defined as “give your full attention or effort to something” (Oxford School Dictionary, 2004: 94). The Autism Checklist (2006) states that “autism affects thought, perception and attention”, highlighting the fact that concentration can be considered difficult for children diagnosed with autism. Diagram 29 shows the scores achieved with regard to this skill in the pre- and post-test.



**Diagram 29: Pre- and post-test scores for concentration span**



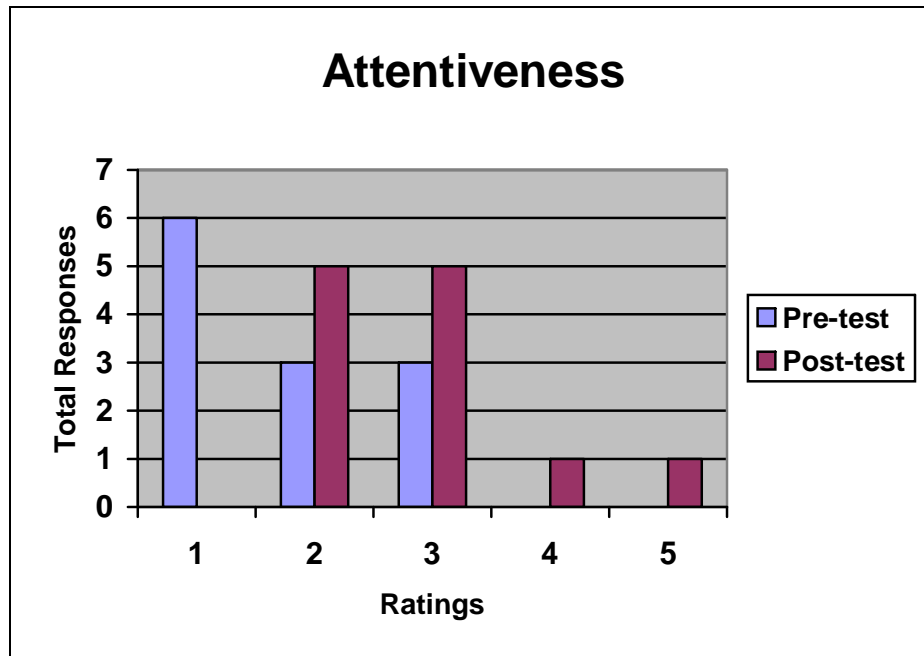
The difficulty that autistic children have with attention, as mentioned in the previous quotation, can be confirmed by the fact the five (41,6%) of the respondents achieved a rating of 1 (very poor/did not appear); four (33,3%) achieved a rating of 2 (poor/to a little extent); and three (25%) achieved a rating of 3 (average/to some extent) in the pre-test.

A large number of the respondents (50%) achieved a rating of 3 (average/to some extent) in the post-test scores, highlighting the fact that the skill did show improvement but remained a challenge for these respondents. However, two (16,6%) of the respondents managed to obtain a 4 (good/to a great extent) and one respondent (8,3%) was able to obtain a 5 (very good/completely).

#### 6.4.2.10 Attentiveness

The tenth assessment area was “attentiveness”. The researcher understands attentiveness to be the ability to pay attention and be focused on a particular activity.

Diagram 30 shows the pre- and post-test scores obtained for this skill.



**Diagram 30: Pre- and post-test scores for attentiveness**

Diagram 30 shows that in the pre-test 50% of the respondents obtained a rating of 1 (very poor/did not appear), indicating that this could be considered a difficult skill for the respondents.

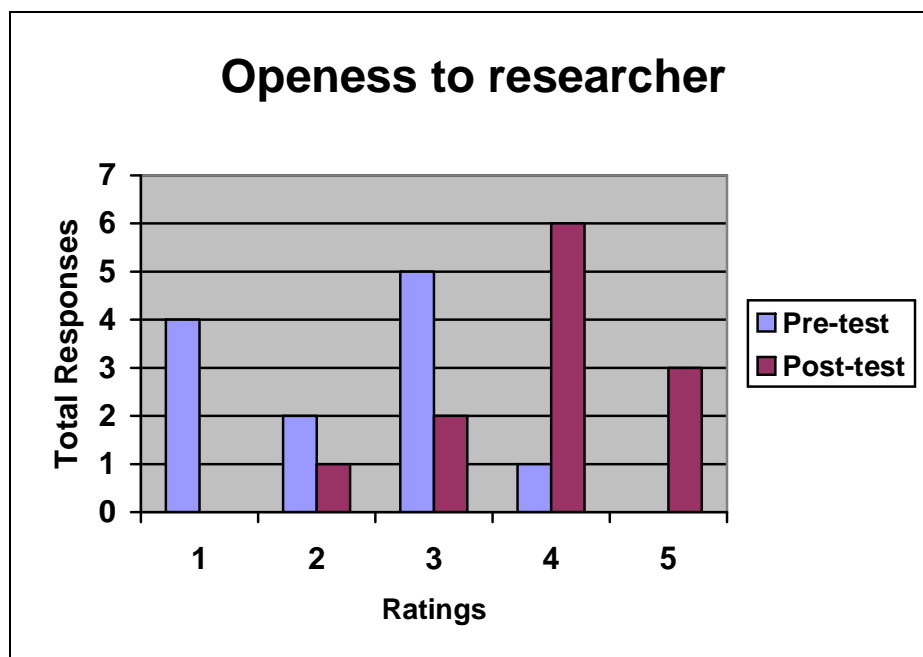
The post-test shows that there was improvement, particularly in the fact that none of the respondents obtained a rating of 1 (very poor/did not appear), which can be considered a big contrast to the pre-test scores. One (8,3%) of the respondents obtained a rating of 4 (good/to a great extent) and another achieved a rating of 5 (very good/completely).

The skill did remain a challenge for the majority of the respondents, however, with five (41,6%) of the respondents achieving a rating of 2 (poor/to a little extent) and the same number achieving a rating of 3 (average/to some extent).

#### 6.4.2.11 Openness to researcher

The final assessment area with regard to non-verbal communication was “openness to researcher”. The researcher assessed the respondents’ ability to open up to her, within the phase, through non-verbal communication, such as eye contact, positive facial expressions and/or positive body positioning.

Diagram 31 shows the pre- and post-test achieved for this skill.



**Diagram 31: Pre- and post-test scores for openness to researcher**

This skill can be considered a challenge to the respondents, given that four (33,3%) obtained a 1 (very poor/did not appear); two (16,6%) obtained a 2 (poor/to a little extent); and five respondents (41,6%) measured a rating of 3 (average/to some extent) in the pre-test.



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When the post-test was conducted, however, the skill showed marked improvement. This is mainly evident in the fact that 50% of the respondents were able to obtain a rating of 4 (good/to a great extent) and three respondents (25%) obtained a rating of 5 (very good/completely).

To give a summary of all the scores achieved with regard to non-verbal communication, the following frequency distribution was compiled (Table 12). Table 12 presents a frequency distribution of all the respondents' ratings according to their non-verbal communication capabilities, by utilizing a pre- and post-test.

**Table 12: Frequency distribution of respondents Non-Verbal Communication ratings.**

Assessment areas	NON-VERBAL COMMUNICATION									
	Pre-Test					Post-Test				
	Very poor/ did not appear	Poor/ to a little extent	Average/ to some extent	Good/ to a great extent	Very good/ completely	Very poor/ did not appear	Poor/ to a little extent	Average/ to some extent	Good/ to a great extent	Very good/ completely
Facial expressions, for the purpose of communication	4	5	2	1	-	-	2	6	3	1
Gestures	-	8	4	-	-	-	-	7	5	-
Appropriate use of personal space	3	3	6	-	-	-	3	4	5	-
Eye contact	3	5	3	1	-	-	-	8	4	-
Interest in listening to the researcher	6	3	3	-	-	1	2	5	2	2
Appropriate use of silence	6	4	2	-	-	4	1	6	1	-
Level of appropriate response to listening	3	6	3	-	-	-	2	6	3	1
Ability to focus	5	4	3	-	-	-	4	4	3	1
Concentration span	5	4	3	-	-	-	3	6	2	1
Attentiveness	6	3	3	-	-	-	5	5	1	1
Openness to researcher	4	2	5	1	-	-	1	2	6	3
<b>Total</b>	<b>45</b>	<b>47</b>	<b>37</b>	<b>3</b>	<b>0</b>	<b>5</b>	<b>23</b>	<b>59</b>	<b>35</b>	<b>10</b>

The total scores achieved by the respondents in relation to non-verbal communication can be summarized as follows:





- Only a select few of the children (1,9%) were able to score a rating of 4 (good/to a great extent) and/or 5 (very good/completely) in the pre-test scoring, indicating the lack of non-verbal communication skills.
- The majority (97%) of the children scored a rating of a 3 (average/to some extent), a 2 (poor/to a little extent) or a 1 (very poor/did not appear) in the pre-test. This again indicates the great difficulty that these autistic children have with the skill of non-verbal communication.
- In the post-test there was a combined score of 45 (34%) falling on a rating of 4 (good/to a great extent) or 5 (very good/completely). In comparison with the pre-test there is a positive improvement, indicating the effectiveness of the play technique programme.
- One is also able to see a positive improvement in the decrease in children who scored a 1 (very poor/did not appear) or 2 (poor/to a little extent) rating. In the pre-test the total scored on these ratings was 92 (69,6%), while in the post-test the total scored was 28 (21,2%).
- However, the majority (44,6%) of the children scored a rating of 3 (average/to some extent) in the post-test, continuing to indicate that non-verbal communication, although it did improve with the play technique programme, is still a challenge for these autistic children.

The following table, Table 13, shows the median scores of the respondents with regard to non-verbal communication. This table includes the same focus areas as in Table 12, with these being explained on page 204.

**Table 13: Median scores of respondents' ratings with regard to non-verbal communication**

Class		1	2	3	4
Number of respondents		3	2	2	5
Median	Pre-Test	1.2727273	2.0909091	1.4545455	2.3636364
	Post-Test	3.000000	2.8636364	2.6363636	3.8181818
Minimum	Pre-Test	1.0909091	1.3636364	1.3636364	1.5454545
	Post-Test	2.1818182	2.2727273	2.5454545	2.7272727
Maximum	Pre-Test	2.6363636	2.8181818	1.5454545	2.8181818
	Post-Test	3.6363636	3.4545455	2.7272727	4.4545455
Interquartile deviation	Pre-Test	0.772725	0.72727	0.090905	0.22727
	Post-Test	0.72727	0.59091	0.09091	0.31818
Range	Pre-Test	1.5454545	1.4545455	0.1818182	1.2727273
	Post-Test	1.4545455	1.1818182	0.1818182	1.7272727

The Wilcoxon Signed-Rank Test for a Paired Experiment (Wackerly, Mendenhall & Scheaffer, 2002) was used to test the statistical significance of these results. The test criterion on a 1% level of significance allows for the null hypothesis to be rejected if the p-value is less than ( $<$ ) 0.01. The null hypothesis ( $H_0$ ) states that the intervention had no effect. The alternative hypothesis ( $H_1$ ) states that the intervention did have an effect.



With regard to non-verbal communication the following results are yielded by the Wilcoxon Signed-Rank Test for a Paired Experiment. The test statistic given is 0.0 and the p-value is 0.00025, therefore leading to the following conclusion:

- 0.00025 is less than 0.01%, which is considered the level of significance;
- Therefore the null hypothesis is rejected;
- The alternative hypothesis is accepted;
- This allows the conclusion that the intervention (the play technique programme) had a highly significant effect on the non-verbal communication of the respondents.

#### 6.4.3 Social Interaction

Social interaction is defined by Social Behaviour and Interaction (2006) as being “the acts, actions, or practices of two or more people mutually oriented towards each other’s selves ... they must be aware of each other ... and it involves a mutual orientation”. Attwood (1995: 28) commented that autistic children might have an inability to interact with peers, as well as a lack of desire to interact with those around them. They may display socially and emotionally inappropriate behaviour. Therefore, these statements highlight the difficulties that autistic children may experience with social interaction.

The researcher’s goal with respect to this variable was to test the following sub-hypothesis:

- **If autistic children in middle childhood are involved in a play technique programme then their social interaction skills will improve.**

Based on the in-depth literature study, the following 12 assessment areas of social interaction were included in the self-constructed measuring instrument (see Addendum C):



- Level of interest in social interaction
- Desire for physical contact with researcher
- Desire for emotional contact with researcher
- Participation in play phase
- Ability to reach out, emotionally, within the phase
- Ability to show obedience to any instructions, both verbal and non-verbal
- Reaction/level of comfort to social interaction
- Appropriate response to social interaction
- Interaction cues
- Invitation cues
- Awareness of researcher
- Level of motivation

The researcher will firstly give an overview of the scores achieved by the respondents, through looking at the combined rating that each individual respondent achieved with regard to social interaction. The focus will then shift to each individual assessment area as listed previously, and the combined pre- and post-test scores achieved by the respondents will be looked at. Then the researcher will give an overview of the combined scores achieved for each assessment area, highlighting the changes indicated by a comparison of the pre- and post-test measurements.

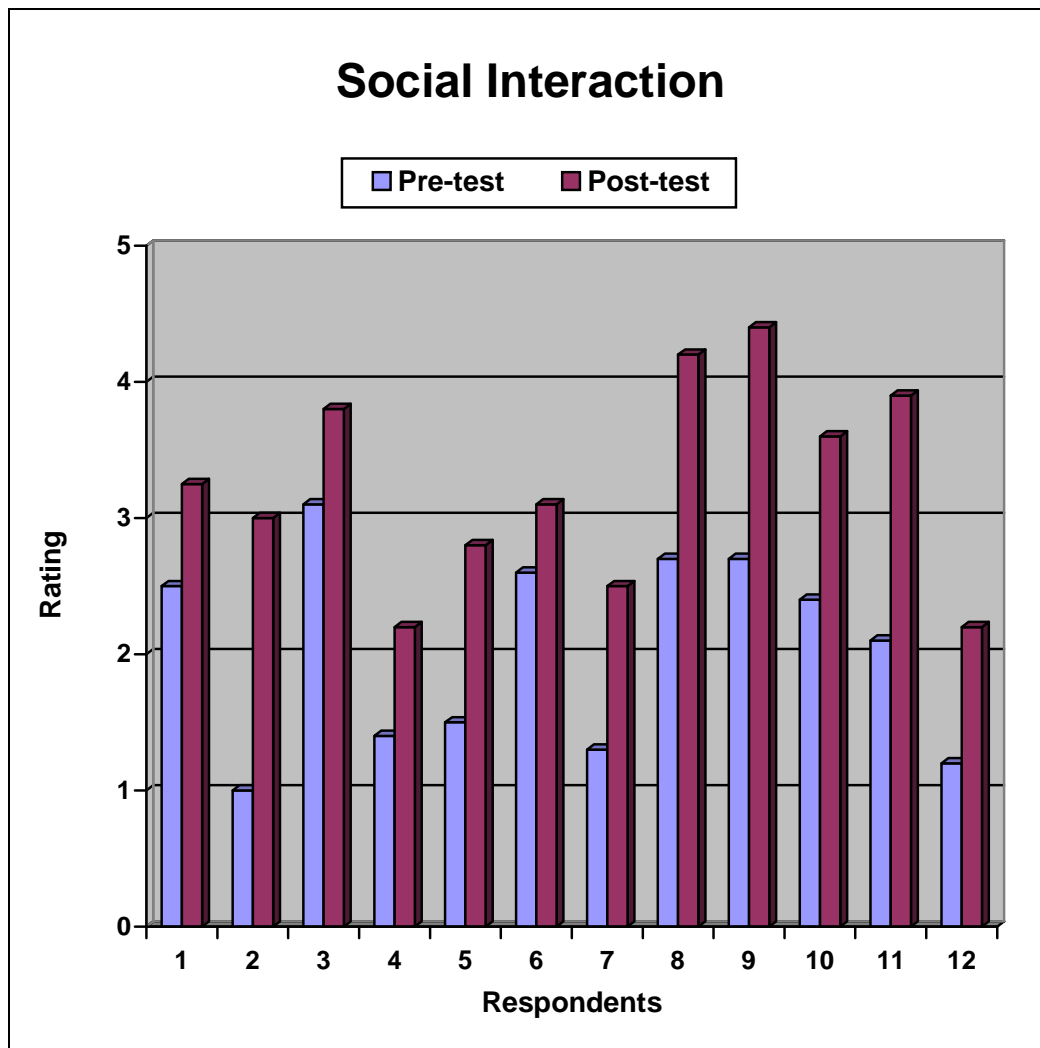
It is important to note once again that the ratings given on the five-point scale were counted/scored according to the following distinctions.

- 1: Very Poor/Did not appear (no occurrence of the particular behaviour being measured)



- 
- **2:** Poor/To a little extent (behaviour noted on one occasion within the time period of the measurement)
  - **3:** Average/To some extent (behaviour noted on two occasions within the time period of the measurement)
  - **4:** Good/ To a great extent (behaviour noted on three occasions within the time period of the measurement)
  - **5:** Very good/Completely (behaviour noted on four or more occasions within the time period of the measurement)

In Diagram 32 the researcher gives an indication of the pre- and post-test scores of each respondent individually, with regard to social interaction skills. The researcher obtained these scores by combining all the ratings that each individual respondent scored with regard to the 12 assessment areas of social interaction, both in the pre- and post-test measurements, and then dividing each total score by 12 in order to obtain an average score achieved by each individual.



**Diagram 32: Combined pre- and post-test scores for social interaction of each respondent**

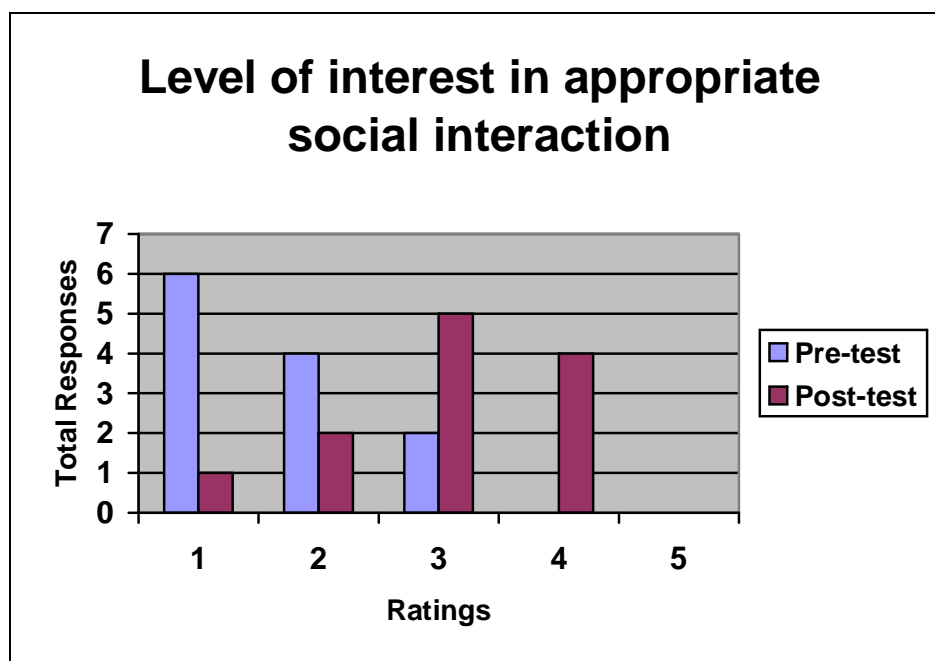
Diagram 32 shows that, if the pre- and post-test scores of each respondent individually are compared, one can clearly see the improvement that took place for all the respondents once the play technique programme was implemented.

In order to gain a better understanding of these scores, the researcher will now focus on each assessment area individually.

### 6.4.3.1 Level of interest in appropriate social interaction

The first assessment area with regard to social interaction was the “level of interest in appropriate social interaction”. Interest is defined as “a feeling of wanting to know about or help with something” (Oxford School Dictionary, 2004: 238) and therefore this assessment area can be understood as the respondents’ willingness to actively take part in appropriate social interaction. As has been previously mentioned, social interaction can be considered a difficulty for individuals diagnosed on the autism spectrum. As mentioned by Robledo and Ham-Kucharski (2005: 1), “autism is a neurological disorder that usually manifests itself early in the toddler years. It hampers a child’s ability to learn how to communicate, interact with others socially, and indulge in imaginative play”.

Diagram 33 shows the pre- and post-test scores that the respondents scored in relation to the first assessment area.



**Diagram 33: Pre- and post-test scores for level of interest in appropriate social interaction**



One can see that in the pre-test 50% of the respondents obtained a rating of 1 (very poor/did not appear) and 33,3% achieved a rating of 2 (poor/to a little extent), highlighting the fact that social interaction was difficult for the respondents.

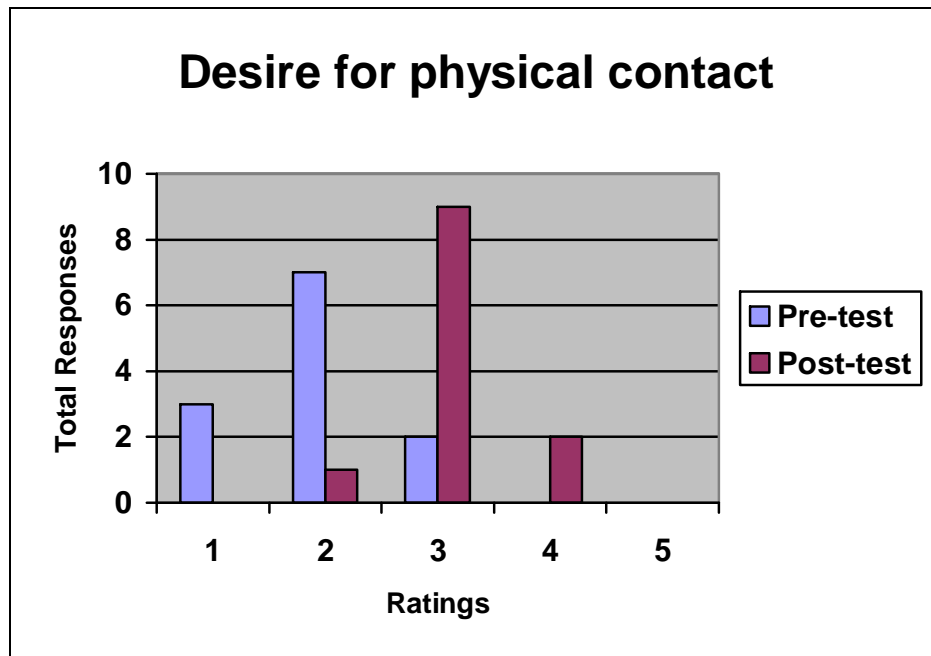
Once the intervention was introduced progress was evident, with only one (8,3%) of the respondents obtaining a rating of 1 (very poor/did not appear) and five (41,6%) of the respondents achieved a rating of 3 (average/to some extent). It was also positive to note that 4 (33,3%) of the respondents were able to obtain a rating of 4 (good/to a great extent).

#### 6.4.3.2 Desire for physical contact

The second area of assessment regarding social interaction was that of “desire for physical contact”. Desire can be understood as “a feeling of wanting something very much” (Oxford School Dictionary, 2004: 126). This assessment area can therefore be understood as the respondents’ longing for any form of appropriate physical contact with the researcher, within the play environment.

Diagram 34 shows the pre- and post-test scores achieved with regard to this skill.





**Diagram 34: Pre- and post-test scores for desire for physical contact**

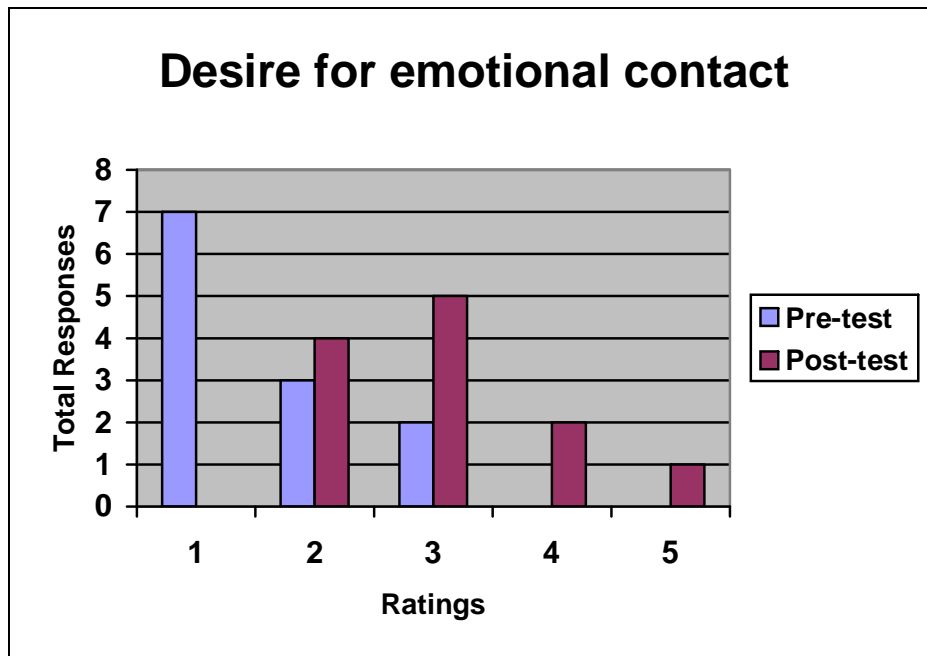
It is evident once again that this skill was challenging for the respondents in the pre-test, with three (25%) of the respondents achieving a rating of 1 (very poor/did not appear) and seven (58,3%) achieving a rating of 2 (poor/to a little extent).

Progress did occur once the intervention was introduced, which can be seen in the post-test scores recorded. It is important to note, however, that nine (75%) of the respondents obtained a rating of 3 (average/to some extent), which indicates that although the respondents did show an improvement, the skill did remain a challenge for the majority of them.

#### 6.4.3.3 Desire for emotional contact

The next social interaction assessment area was that of “desire for emotional contact”. This can be understood as the respondents’ longing for emotional contact within the play situation.

Diagram 35 shows the pre- and post-test scores obtained by the respondents with regard to this skill.



**Diagram 35: Pre- and post-test scores for desire for emotional contact**

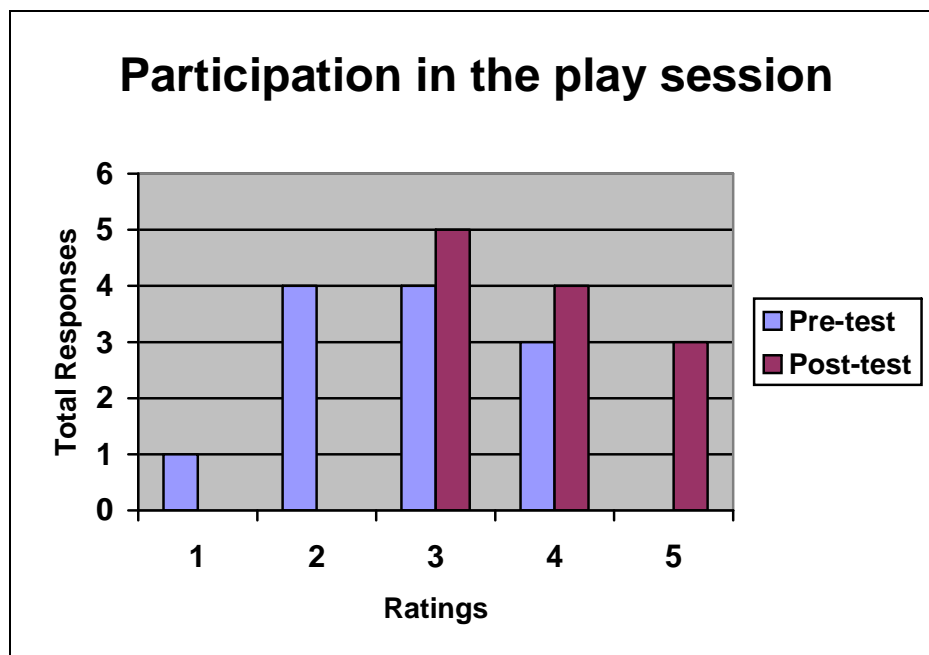
Again one is able to notice that in the pre-test the respondents showed a weakness with regard to this skill, with seven (58,3%) obtaining a rating of 1 (very poor/did not appear) and three (25%) obtaining a rating of 2 (poor/to a little extent).

The post-test scores clearly show that progress took place. A total of five respondents (41,6%) were able to obtain a rating of 3 (average/to some extent); two respondents (16,6%) were able to obtain a rating of 4 (good/to a great extent) and one respondent (8,3%) was able to obtain a rating of 5 (very good/completely).

#### 6.4.3.4 Participation in the play phase

“Participation in the play phase” was the fourth area of assessment with regard to social interaction. The Oxford School Dictionary (2004: 323) defines participation as “take part or have a share in something”.

Diagram 36 shows the combined pre- and post-test scores achieved by the respondents.



**Diagram 36: Pre- and post-test scores for participation in the play phase**

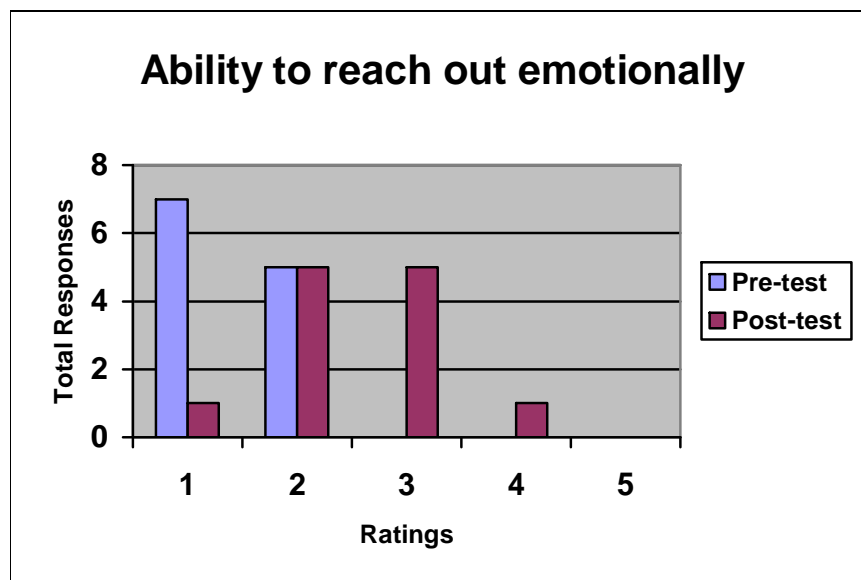
Although some of the respondents did have difficulty with this skill initially, with one (8,3%) achieving a rating of 1 (very poor/did not appear) and four (33,3%) achieving a rating of 2 (poor/to a little extent), 59% of the respondents did show some capability, scoring 3 (average/to some extent) and 4 (good/to a great extent) on the measuring scale in the pre-test.

In the post-test most of the respondents showed a good grasp of this skill, with four (33,3%) achieving a rating of 4 (good/to a great extent) and three (25%) achieving a rating of 5 (very good/completely). It is important to note, however, that five (41,6%) of the respondents did achieve a rating of 3 (average/to some extent), highlighting the fact that this skill remained slightly challenging for them.

#### 6.4.3.5 Ability to reach out emotionally

The fifth social interaction assessment area was the “ability to reach out emotionally”. This can be understood as the respondents’ ability to engage on an emotional level with the researcher, through verbal and non-verbal communication.

In the following diagram, Diagram 37, one can clearly see that all the respondents found this skill a challenge in the pre-test. This can be seen in the fact that seven (59%) of the respondents achieved a rating of 1 (very poor/did not appear) and the other five (41%) respondents achieved a rating of 2 (poor/to a little extent).

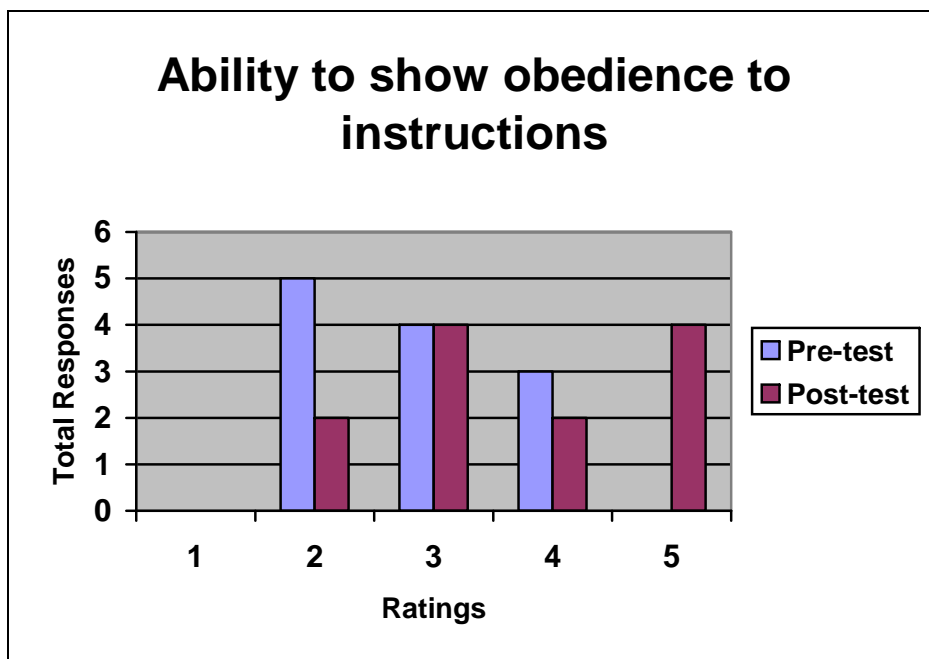


**Diagram 37: Pre- and post-test scores for ability to reach out emotionally**

In the post-test improvement was evident: only one respondent (8,3%) achieved the lowest rating (1). It is clear, however, that the skill did remain a challenge for the respondents, with five (41,6%) of the respondents achieving a rating of 2 (poor/to a little extent) and the other five (41,6%) achieving a rating of 3 (average/to some extent). Only one respondent (8,3%) achieved a rating of 4 (good/to a great extent).

#### 6.4.3.6 Ability to show obedience to instructions

The following social interaction assessment area was the “ability to show obedience to instructions”. Obedience can be understood as the ability to comply with a situation and be willing to obey (Oxford School Dictionary, 2004: 305). Therefore the assessment area focused on the respondents’ ability to comply with instructions given within the play phase. Diagram 38 shows the pre- and post-test scores obtained for this skill.



**Diagram 38: Pre- and post-test scores for ability to show obedience to instructions**



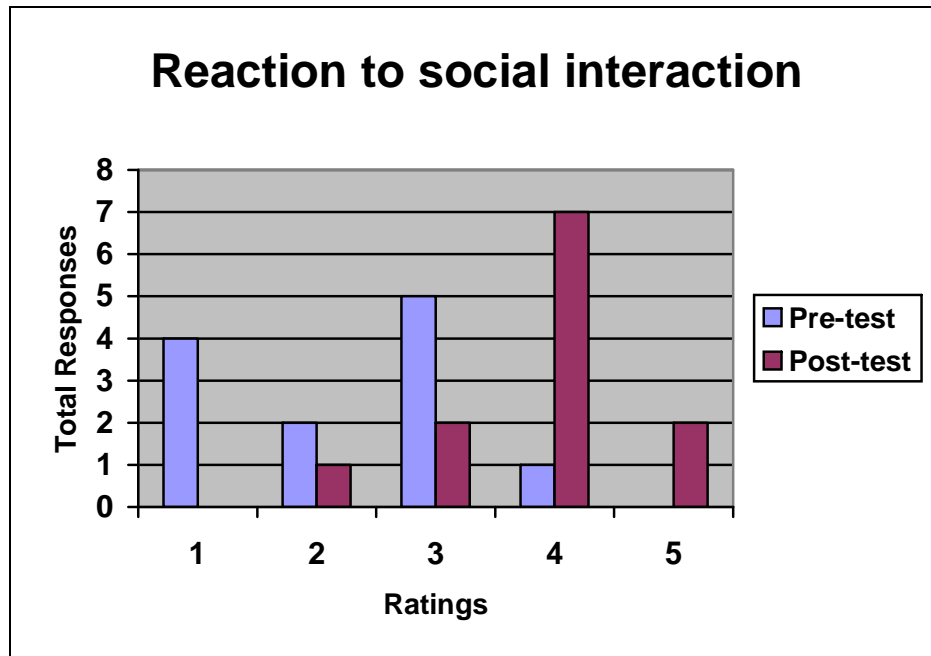
Although the respondents generally did battle with this skill in the pre-test, with five respondents (41,6%) achieving a rating of 2 (poor/to a little extent) and four respondents (33,3%) achieved a rating of 3 (average/to some extent), a total of three respondents (25%) were however able to achieve a rating of 4 (good/to a great extent) in the pre-test.

When the post-test was conducted progress was clearly evident. This is obvious in the fact that four (33,3%) of the respondents were able to obtain a rating of 5 (very good/completely), showing a good ability with regard to this skill. A total of two respondents (16,6%) obtained a rating of 4 (good/to a great extent) and four (33,3%) obtained a rating of 3 (average/to some extent).

#### 6.4.3.7 Reaction to social interaction

“Reaction to social interaction’ was the seventh assessment area with regard to social interaction. As has been previously mentioned, social interaction can be defined as being mutually reciprocal and having free passage to each other when communicating (Oxford Dictionary, 2004: 428). This assessment area focused on measuring the respondents’ physical and emotional response to social interaction initiated by both the researcher and the respondent.

As can be seen in Diagram 39, the respondents did show some difficulty with this area, but in the post-test the majority of the respondents (59%) managed to obtain a rating of 4 (good/to a great extent) and two (16,6%) of the respondents a rating of 5 (very good/completely), indicating progress.

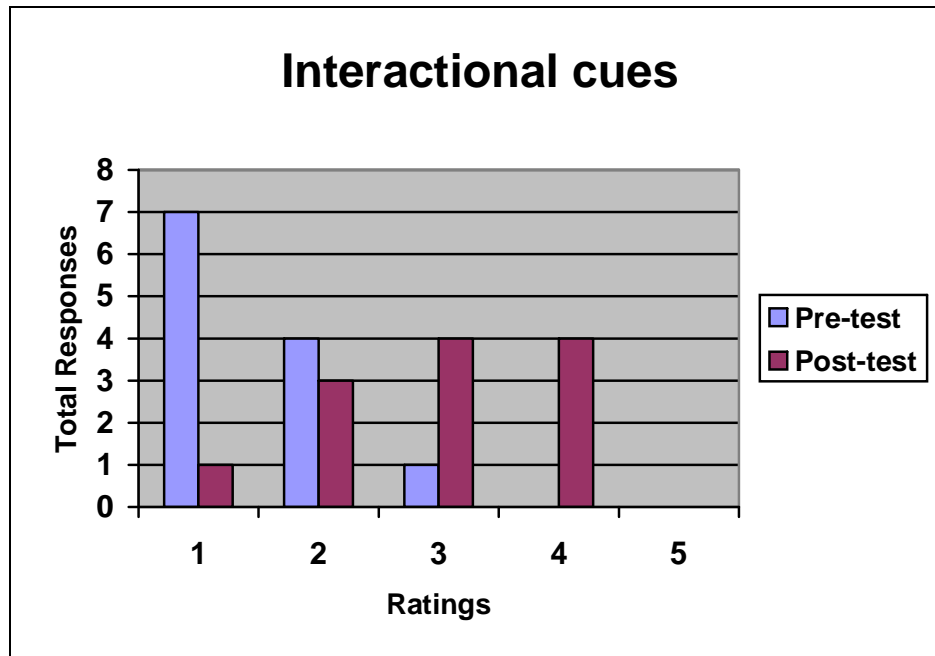


**Diagram 39: Pre- and post-test scores for reaction to social interaction**

#### 6.4.3.8 Interactional cues

The eighth area assessed with regard to social interaction was “interactional cues”. Interactional cues, in the context of this study, can be understood to be the cues that one uses in order to encourage interaction.

In the following diagram, Diagram 40, one can see the pre- and post-test scores obtained by the respondents with regard to this skill.



**Diagram 40: Pre- and post-test scores for Interactional cues**

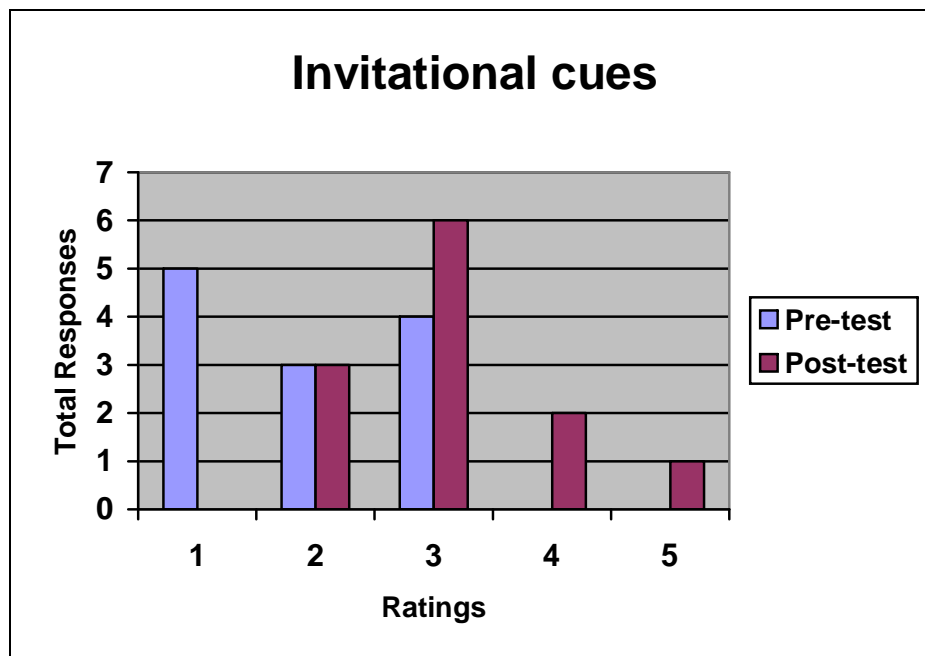
As has been mentioned previously, social interaction can be considered a challenge for individuals on the autism spectrum and therefore the ability/skill to use interactional cues can be understood also to be a challenge for these individuals. This was evident in the fact that seven (59%) of the respondents were rated on level 1 (very poor/did not appear) in the pre-test, while four (33%) received a rating of 2 (poor/to a little extent).

Improvement was evident when the post-test was conducted. This can be seen in the decrease in the number of respondents who achieved a rating of 1 (very poor/did not appear), with only one respondent (8,3%) achieving this rating. Four (33,3%) of the respondents were able to achieve a rating of 4 (good/to a great extent); another four (33,3%) achieved a rating of 3 (average/to some extent) and three (25%) achieved a rating of 2 (poor/to a little extent), indicating that the skill did remain a challenge for some of the respondents.



#### 6.4.3.9 Invitational cues

The ninth area of assessment was “invitational cues”. The researcher understands invitational cues to indicate an individual’s ability to invite interaction from those around him/her. Diagram 41 shows the pre- and post-test scores obtained by the respondents with regard to this skill.



**Diagram 41: Pre- and post-test scores for invitational cues**

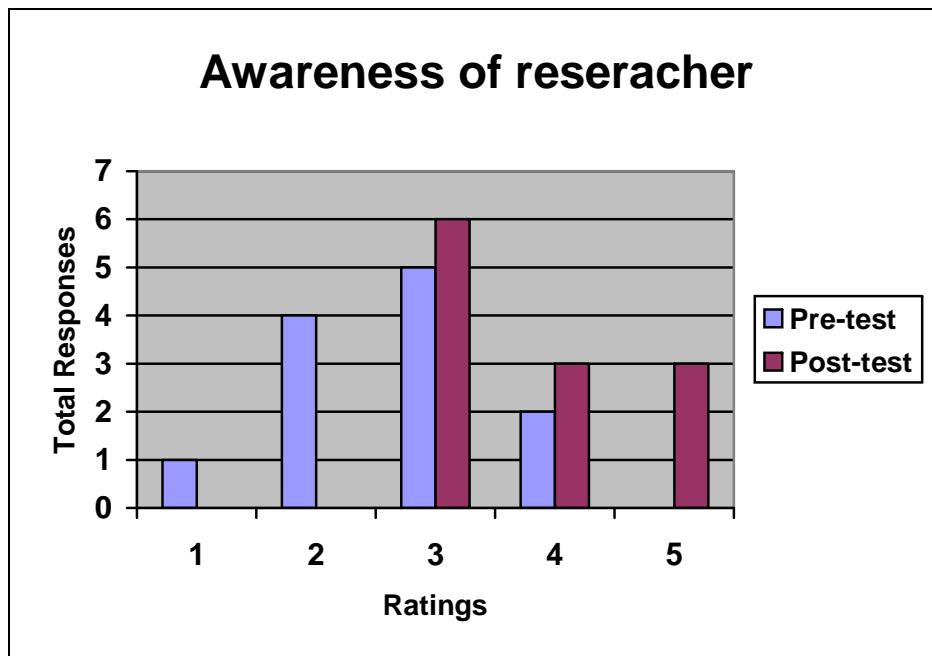
When the post-test was conducted progress was evident. Two (16,6%) of the respondents were able to achieve a rating of 4 (good/to a great extent) and one respondent (8,3%) was able to achieve a rating of 5 (very good/completely).

This area remained a challenge even after the intervention, however: 50% of the respondents achieved a rating of 3 (average/to some extent) in the post-test and three (25%) achieved a rating of 2 (poor/to a little extent).

#### 6.4.3.10 Awareness of the researcher

“Awareness of the researcher” was the tenth assessment area focused on. Awareness can be understood as “knowing; realizing” (Oxford School Dictionary, 2004: 31). This assessment area therefore focused on the respondents’ knowledge and consciousness of the researcher, indicating this through verbal and non-verbal communication.

Diagram 42 shows the pre- and post-test scores respondents achieved with regard to this area.



**Diagram 42: Pre- and post-test scores for awareness of researcher**

In the pre-test in this assessment area, the respondents indicated some difficulty, with one (8,3%) respondent achieving a rating of 1 (very poor/did not appear), four (33,3%) achieving a 2 (poor/too a little extent) and five (41,6%) achieving a rating of 3 (average/to some extent).

When the post-test was conducted, three (25%) of the respondents were able to achieve a rating of 4 (good/to a great extent), showing improvement with regard to this rating; and three respondents (25%) were able to achieve a rating of 5 (very good/completely), also indicating an improvement. The other six (50%) achieved a rating of 3 (average/to some extent) in the post-test.

#### 6.4.3.11 Level of motivation

The eleventh area of assessment regarding social interaction was “level of motivation”. This assessment area focused specifically on the respondents’ level of motivation to participate in the play phase as well as to interact with the researcher in a social manner.

Diagram 43 shows the pre- and post-test scores achieved by the respondents with regard to this skill.

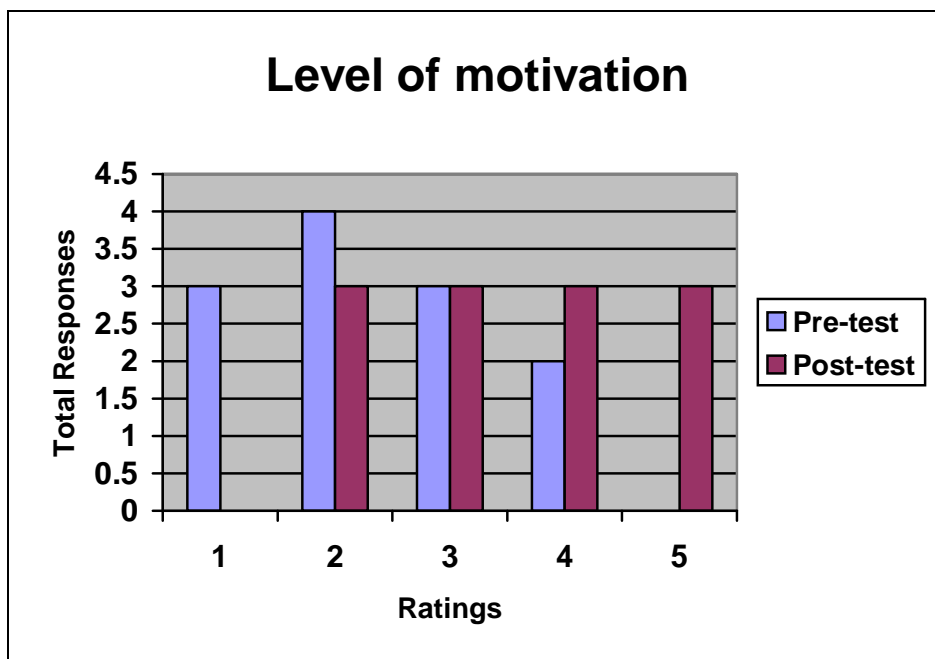


Diagram 43: Pre- and post-test scores for level of motivation



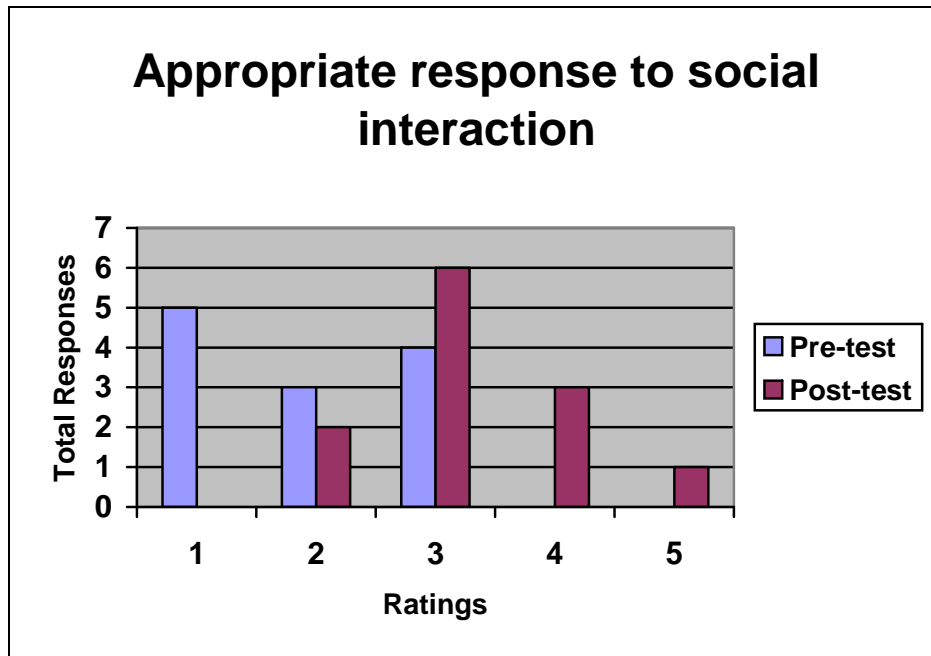
Diagram 43 reveals that a large number of the respondents battled with this skill. This is suggested by the fact that three (25%) of the respondents achieved a rating of 1 (very poor/did not appear), four (33,3%) achieved a rating of a 2 (poor/to a little extent), and three (25%) achieved a rating of 3 (average/to some extent).

Once the intervention had been completed progress was clearly evident. This is mostly noticeable in the fact that three (25%) of the respondents were able to achieve a rating of 4 (good/to a great extent) and another three (25%) a rating of 5 (very good/completely).

#### 6.4.3.12 Appropriate response to social interaction

The final assessment area with regard to social interaction was “appropriate response to social interaction”. This assessment area can be understood as the overall measurement of social interaction, taking all the previous focus areas into account.

Diagram 44 shows the combined pre- and post scores for this skill.



**Diagram 44: Pre- and post-test scores for appropriate response to social interaction**

In the pre-test the respondents showed weakness in this area, as suggested by the fact that all the respondents scored average or below average. Once the intervention was implemented progress was noted. This can be seen in the fact that three (25%) of the respondents obtained a rating of 4 (good/to a great extent) and one respondent (8,3%) was able obtain a rating of 5 (very good/completely).

To give a summary of all the scores achieved with regard to social interaction, the following frequency distribution was compiled. Table 14 presents a frequency distribution of the respondents' combined ratings according to their social interaction skills, by utilizing a pre- and post-test.



**Table 14: Frequency distribution of respondents' social interaction ratings**

Assessment areas	SOCIAL INTERACTION									
	Pre-Test					Post-Test				
	Very poor/did not appear	Poor/ to a little extent	Average/to some extent	Good/to a great extent	Very good/ completely	Very poor/did not appear	Poor/ to a little extent	Average/to some extent	Good/to a great extent	Very good/ completely
Level of interest in appropriate social interaction	6	4	2	-	-	1	2	5	4	-
Desire for physical contact with researcher	3	7	2	-	-	-	1	9	2	-
Desire for emotional contact with researcher	7	3	2	-	-	-	4	5	2	1
Participation in play phase	1	4	4	3	-	-	-	5	4	3
Ability to reach out, emotionally, within the phase	7	5	-	-	-	1	5	5	1	-
Ability to show obedience to any instructions, both verbal and non-verbal	-	5	4	3	-	-	2	4	2	4
Reaction/level of comfort to social interaction	4	2	5	1	-	-	1	2	7	2
Appropriate response to social interaction	5	3	4	-	-	-	2	6	3	1
Interactional cues e.g. Nodding, maintaining eye contact	7	4	1	-	-	1	3	4	4	-
Invitational cues e.g. Encouraging the interaction	5	3	4	-	-	-	3	6	2	1
Awareness of researcher	1	4	5	2	-	-	-	6	3	3
Level of motivation	3	4	3	2	-	-	3	3	3	3
<b>Total</b>	<b>49</b>	<b>48</b>	<b>36</b>	<b>11</b>	<b>0</b>	<b>3</b>	<b>26</b>	<b>60</b>	<b>37</b>	<b>18</b>



Table 14 summarizes the ratings achieved with regard to social interaction as follows, when focusing on the total scores achieved for each rating in the pre- and post-test:

- It is clear that the respondents showed a weakness with their social interaction skills: they mainly scored a rating of 1 (very poor/did not appear) and 2 (poor/to a little extent) in the pre-test.
- The weakness in social interaction skills was again highlighted by the fact that none of the respondents was able to score a rating of 5 (very good/completely) in his/her pre-test scores.
- There is, however, a clear indication of positive improvement in social interaction, as can be seen in the increase and/or presence of 4 (good/to a great extent) or 5 (very good/completely) ratings.
- However, once again, it is clear that the majority (41,6%) of the ratings achieved were a 3 (average/to some extent) in the post-test, indicating the challenge that autistic children experience with regard to social interaction, even when involved in an intervention/programme of some kind.

Table 15 displays the median scores for respondents' social interaction ratings.

**Table 15: Median scores of respondents' ratings with regard to Social Interaction**

Class		1	2	3	4
Number of respondents		3	2	2	5
Median	Pre-Test	1.2500000	2.2916667	1.4166667	2.5833333
	Post-Test	3.0833333	3.0000000	2.6666667	4.0000000
Minimum	Pre-Test	1.0833333	1.4166667	1.3333333	1.9166667
	Post-Test	2.1666667	2.2500000	2.5000000	3.1666667



<b>Maximum</b>	Pre-Test	2.5000000	3.1666667	1.5000000	2.9166667
	Post-Test	3.2500000	3.7500000	2.8333333	4.4166667
<b>Interquar-tile deviation</b>	Pre-Test	0.70835	0.875	0.083335	0.375
	Post-Test	0.541665	0.75	0.166665	0.25
<b>Range</b>	Pre-Test	1.4166667	1.7500000	0.1666667	1.0000000
	Post-Test	1.0833333	1.5000000	0.3333333	1.2500000

The Wilcoxon Signed-Rank Test for a Paired Experiment (Wackerly, Mendenhall & Scheaffer, 2002) was used in order to test the statistical significance of these results. The test criterion on a 1% level of significance allows for the null hypothesis to be rejected if the p-value is less than ( $<$ ) 0.01. The null hypothesis ( $H_0$ ) states that the intervention had no effect. The alternative hypothesis ( $H_1$ ) states that the intervention did have an effect.

With regard to social interaction the following results are yielded by the Wilcoxon Signed-Rank Test for a Paired Experiment. The test statistic given is 0.0 and the p-value is 0.00025, therefore leading to the following conclusions:

- 0.00025 is less than 0.01%, which is considered the level of significance;
- Therefore the null hypothesis is rejected;
- The alternative hypothesis is accepted;
- This allows the conclusion that the intervention (the play technique programme) had a highly significant effect on the social interaction of the respondents.





#### 6.4.4 Challenging behaviour

According to Williams (1996: 8–9), autistic children may show “certain ‘bizarre’ behaviour/s and ‘bizarre’ responses to sensory stimuli”. Braude (1999: 24–26) commented that autistic children may display socially and emotionally inappropriate behaviour, with many parents of autistic children mentioning that their children displayed specific behaviours such as a dislike for bathing, food preferences, and/or mood swings and tics.

The researcher’s professional experience in working with autistic children leads her to assert that with an autistic child there are various obvious signs that one will notice. These may include the child displaying inappropriate behaviour in social settings, such as swearing, screaming or causing bodily harm to him/herself or others and the child not displaying normal play behaviour for his/her age. These can be considered challenging behaviours.

The researcher’s goal within this variable was to test the following sub-hypothesis:

- **If autistic children are involved in a play technique programme then their challenging behaviour/s will decrease.**

Based on the in-depth literature study, the following eight assessment areas of challenging behaviour/s were included in the self-constructed measuring instrument (see Addendum C):

- Repetitive behaviour
- Inappropriate behaviour
- Self-injurious behaviour
- Aggressive behaviour
- Agitation



- Anxiety
- Avoidance
- Distractibility

The researcher will firstly give an overview of the scores achieved by the respondents, through looking at the combined rating that each individual respondent achieved with regard to challenging behaviours. The focus will then shift to each individual assessment area as listed previously, and the combined pre- and post-test scores achieved by the respondents will be looked at. Then the researcher will give an overview of the combined scores achieved for each assessment area, highlighting the changes that a comparison between the pre- and post-test measurements yields.

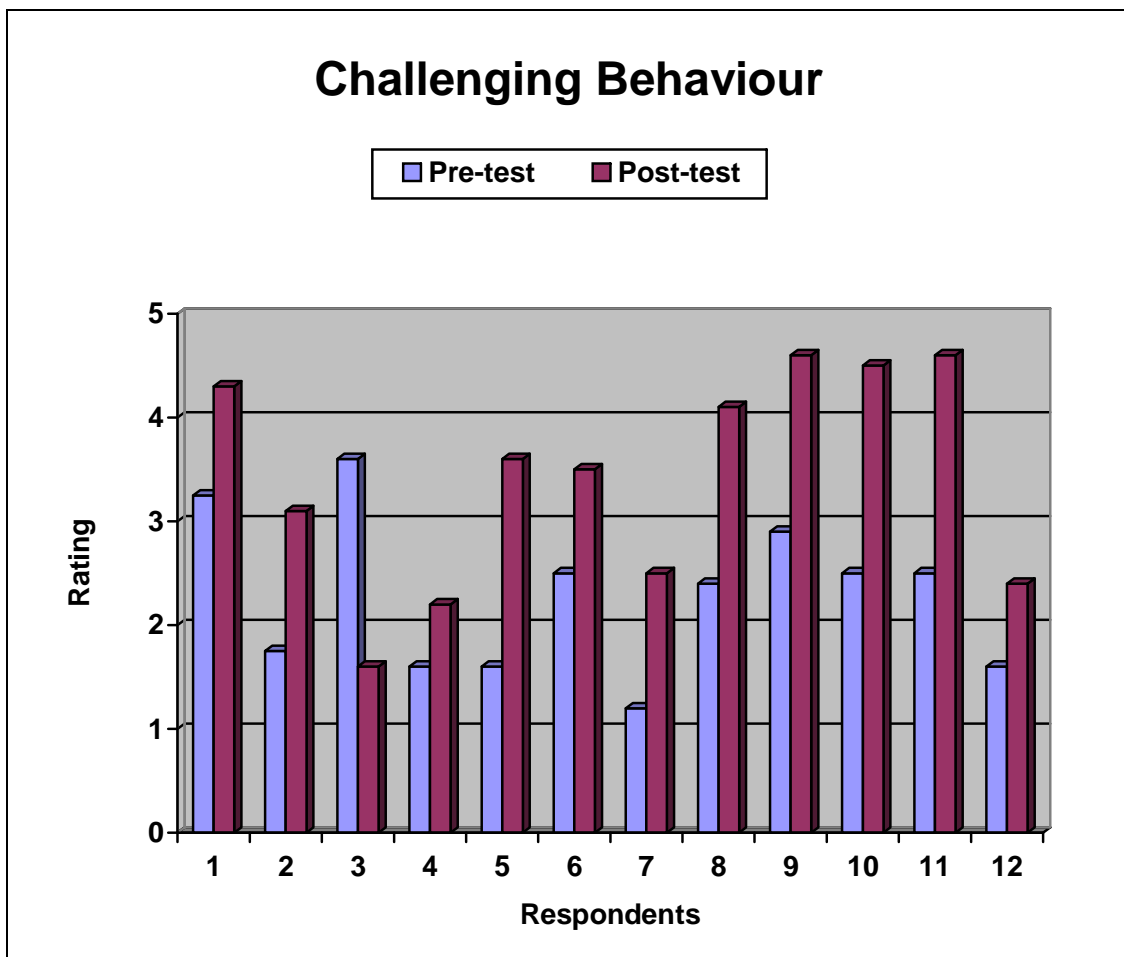
It is important to note once again that the ratings given on the five-point scale were counted/scored according to the following distinctions.

- **1:** Very Poor/Did not appear (no occurrence of the particular behaviour being measured)
- **2:** Poor/To a little extent (behaviour noted on one occasion within the time period of the measurement)
- **3:** Average/To some extent (behaviour noted on two occasions within the time period of the measurement)
- **4:** Good/ To a great extent (behaviour noted on three occasions within the time period of the measurement)
- **5:** Very good/Completely (behaviour noted on four or more occasions within the time period of the measurement)

Diagram 44 gives an indication of the pre- and post-test scores of each respondent individually, with regard to their challenging behaviour/s. The researcher obtained these scores by combining all the ratings that each individual respondent scored with regard to the eight assessment areas of

challenging behaviours, both in the pre- and post-test measurements, and then dividing each total score by eight in order to obtain an average score achieved by each individual.

If one compares the pre- and post-test scores of each respondent individually, as displayed in Diagram 45, one can clearly see the improvement that took place once the play technique programme was implemented.



**Diagram 45: Pre- and post-test scores for challenging behaviour**



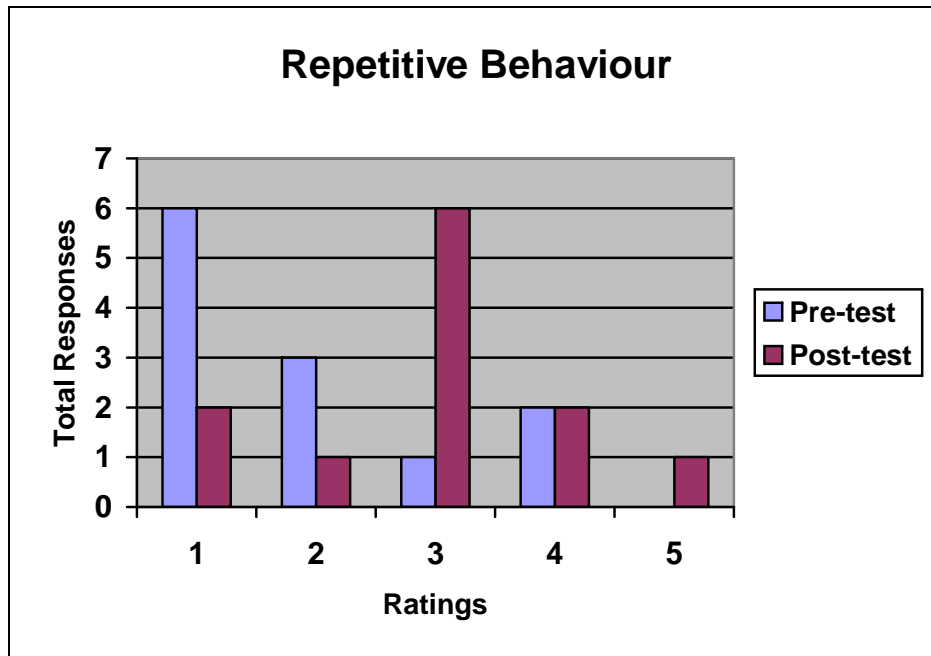
In order to gain a better understanding of the scores given in Diagram 45, it is necessary to focus on each specific assessment area, as has been done with all the previous assessment areas.

It is important to note when looking at these scores that the scoring was done according to the minimization of the behaviour. In other words, if a respondent obtained a rating of 1 (very poor/did not appear) it can be understood that the challenging behaviour was not minimized at all, whereas if the respondent achieved a rating of 5 (very good/completely) the challenging behaviour was minimized completely and was therefore no longer present – thus a positive improvement had taken place.

#### 6.4.4.1 Repetitive behaviour

The first assessment area focused on, with regard to challenging behaviour, was “repetitive behaviour”. Repetitive behaviour can be understood as a behaviour that recurs again and again.

Diagram 46 shows the pre- and post-test scores achieved with regard to this assessment area. One can see the progress that took place. The most noticeable difference, as occurred in previous cases, is the number of respondents who achieved a rating of 1 (very poor/did not appear) in the pre-test: in this case 50% of the respondents achieved this, whereas only 17% achieved this in the post-test.



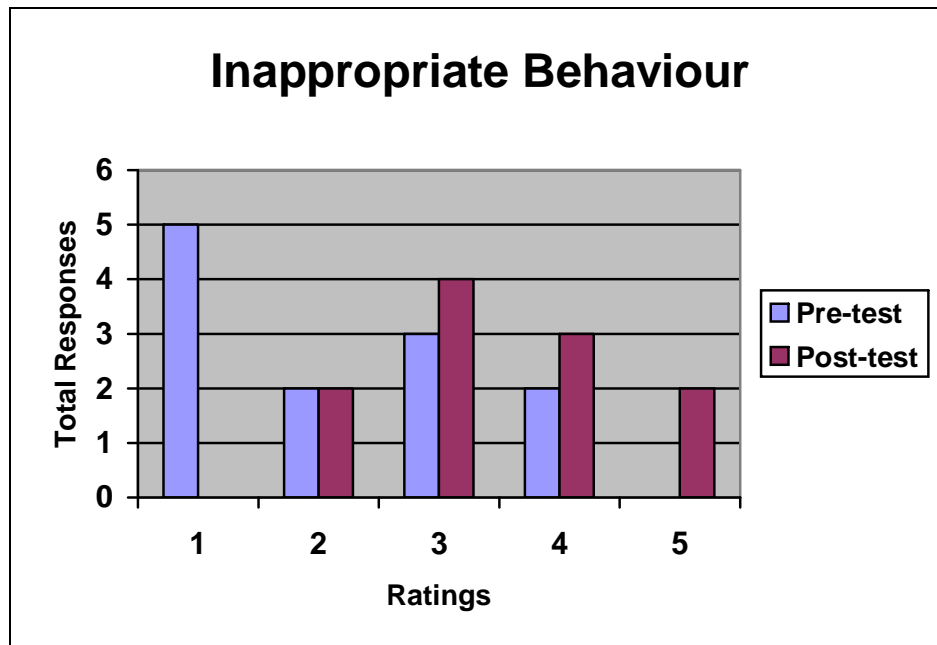
**Diagram 46: Pre- and post-test scores for repetitive behaviour**

It is important to note, however, that 50% of the respondents achieved a rating of 3 (average/to some extent) in the post-test, indicating that this skill remained a challenge for some of the respondents.

#### 6.4.4.2 Inappropriate behaviour

“Inappropriate behaviour” was the second area of assessment. Inappropriate behaviour can refer to any behaviour that is deemed inappropriate for a particular situation at a particular time.

Diagram 47 shows the pre- and post-test scores achieved with regard to this assessment area.



**Diagram 47: Pre- and post-test scores for inappropriate behaviour**

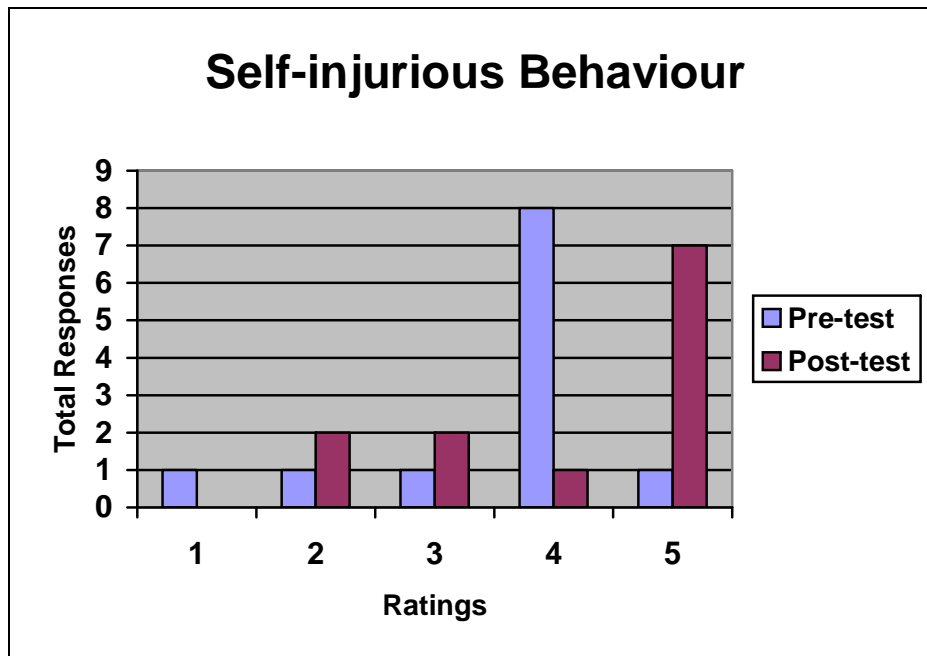
In the pre-test a large proportion of the respondents battled with inappropriate behaviour, with the majority (80%) not achieving a rating above 3 (average/to some extent) with regard to the minimization of this behaviour.

In the post-test, however, improvement can be seen, particularly with regard to the fact that none of the respondents achieved a rating of 1 (very poor/did not appear). The majority (75%) achieved a rating of 3 (average/to some extent), 4 (good/to a great extent) and 5 (very good/completely).

#### 6.4.4.3 Self-injurious behaviour

The next area of assessment was “self-injurious behaviour”. Self-injurious behaviour can be defined as “harm/damage by and on oneself” (Oxford School Dictionary, 2004: 406 & 235). When focusing on this assessment area the researcher was therefore observing the presence of such behaviour.

Diagram 48 shows the combined pre- and post-test scores achieved for this assessment area.



**Diagram 48: Pre- and post-test scores for self-injurious behaviour**

Diagram 48 shows that the majority of the respondents did not show a great deal of self-injurious behaviour when the pre-test was conducted. This is reflected in the fact that 65% of the respondents obtained a rating of 4 (good/to a great extent).

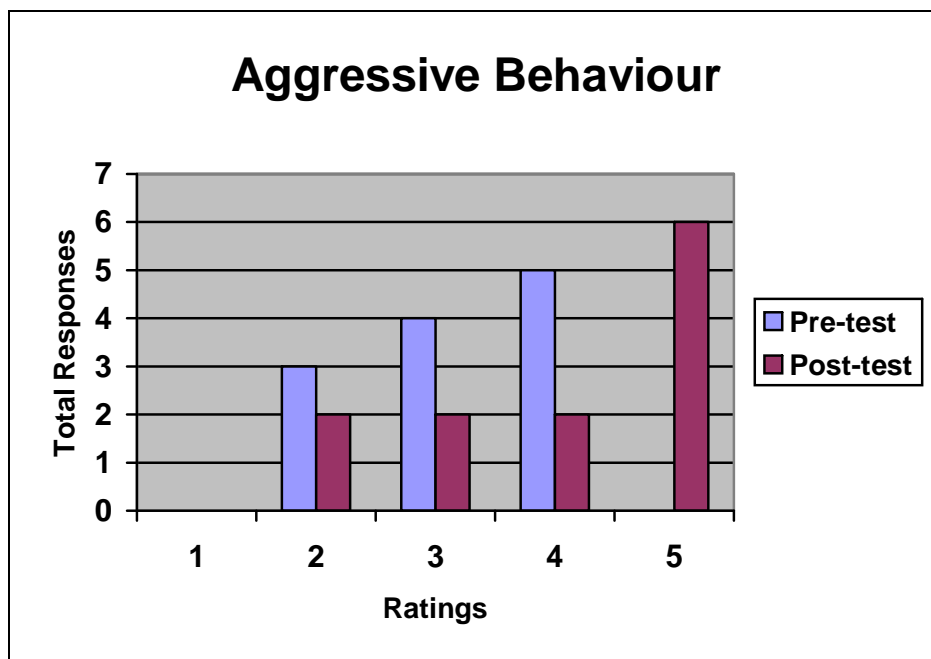
Improvement was still evident in the post-test, however, with seven (58,3%) of the respondents obtaining a rating of 5 (very good/completely), indicating that the self-injurious behaviour was no longer evident within the play phases.

It is important to note that some of the respondents showed an increase in their self-injurious behaviour when the post-test was conducted, although this occurred in only a few cases. This can be verified by the fact that four respondents (33,3%), two in each category, obtained a rating of 2 (poor/to a little

extent) and/or 3 (average/to some extent) in the post-test, as opposed to one respondent (8,3%) in the pre-test. The general improvement, however, can still be considered significant.

#### 6.4.4.4 Aggressive behaviour

The fourth area of assessment was “aggressive behaviour”. Aggressive behaviour can be defined as “likely to attack people; forceful” (Oxford School Dictionary, 2004: 10). Again it can be seen, as shown in Diagram 49, that the majority (75%) of the respondents did not show a high level of aggression when the pre-test was conducted; however, aggression was still evident.



**Diagram 49: Pre- and post-test scores for aggressive behaviour**

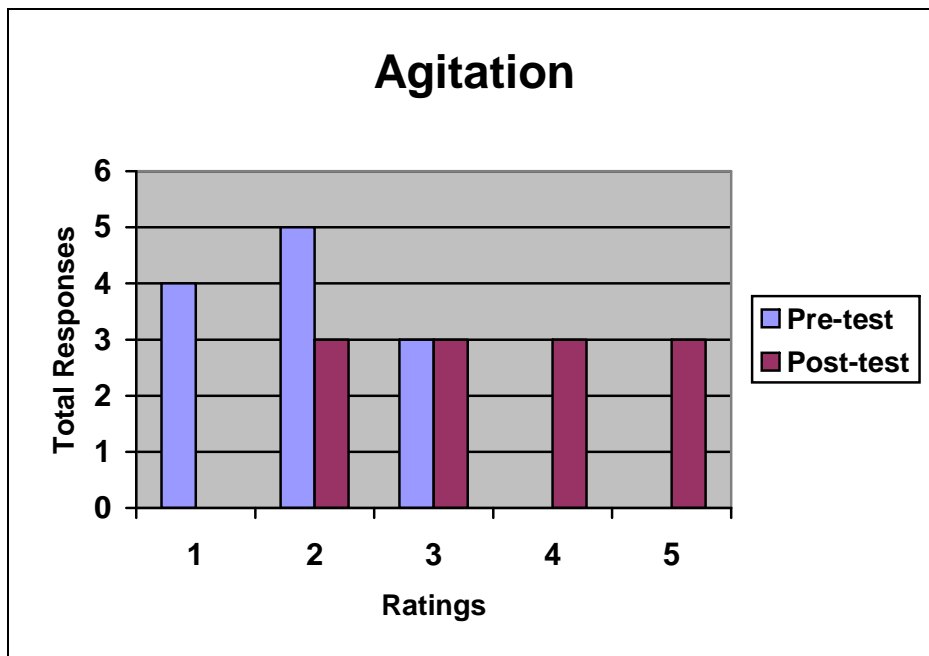
The improvement, however, can still be considered substantial, with 50% of the respondents obtaining a rating of 5 (very good/completely), indicating that these respondents were no longer showing any aggressive behaviour in the play



phases. None of the respondents was able to achieve this rating when the pre-test was conducted.

#### 6.4.4.5 Agitation

The next area of assessment was that of “agitation”, with the pre- and post-test scores achieved being shown in Diagram 50. The Oxford School Dictionary (2004: 10) defines agitation as “feel upset or anxious”. In the context of this study this variable means the amount of agitation present, thereby having an impact on the respondents’ social behaviour.



**Diagram 50: Pre- and post-test scores for agitation**

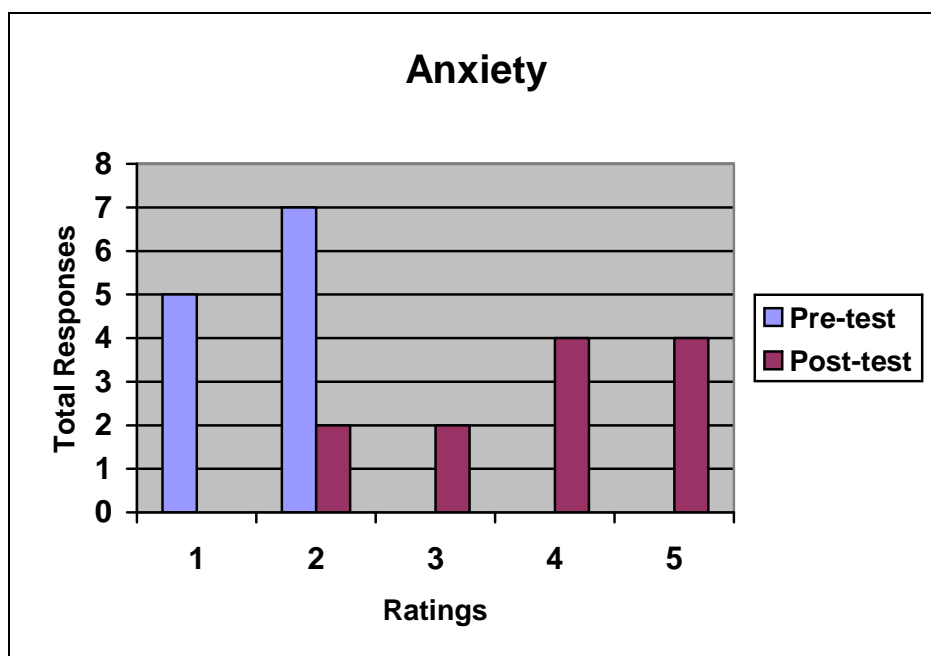
Diagram 50 shows that many of the respondents did battle with agitation when the pre-test was conducted: four (33,3%) of the respondents achieved a rating of 1 (very poor/did not appear), indicating that their agitation was not minimized at all; and five (41,6%) of the respondents achieved a rating of 2 (poor/to a little extent), indicating a slightly lower, but still evident, level of agitation.

When the post-test was completed improvement was noted. This can be seen in the fact that none of the respondents achieved a rating of 1 (very poor/did not appear), indicating that all the respondents did show some minimization of their agitation. All the other ratings received 25% of the respondents respectively. This indicates that agitation did remain a concern for some of the respondents, but 50% showed a positive decline in agitation.

#### 6.4.4.6 Anxiety

‘Anxiety’ was the next assessment area with regard to challenging behaviour. Anxiety can be defined as “being worried” (Oxford School Dictionary, 2004: 19). In this study with regard to the assessment area of anxiety, the researcher was observing the level of anxiety present within the respondents’ social behaviour.

Diagram 51 shows the pre- and post-test scores achieved with regard to this assessment area.



**Diagram 51: Pre- and post-test scores for anxiety**

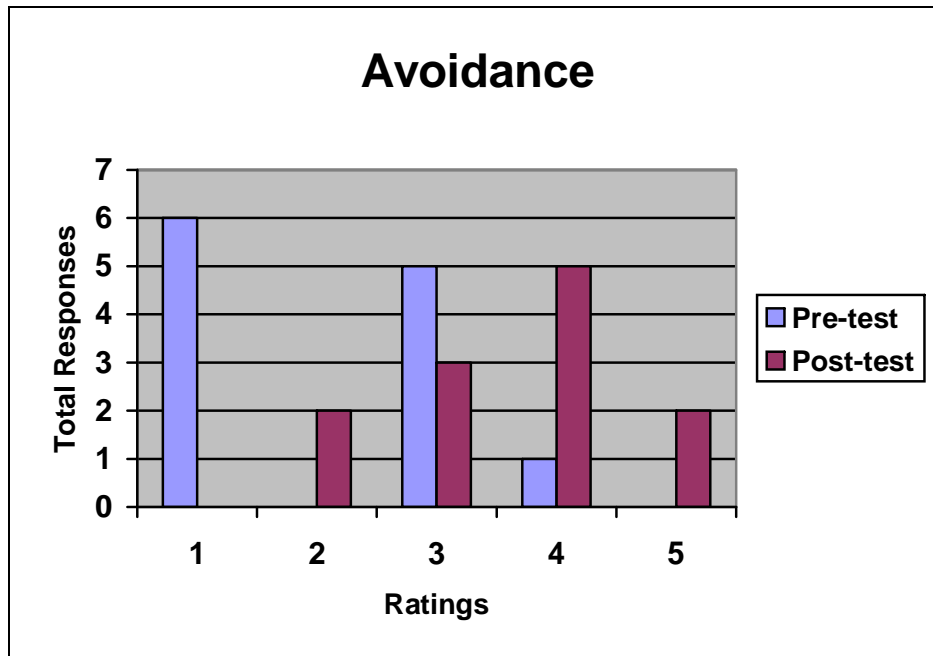


Diagram 51 shows that all the respondents showed significant levels of anxiety when the pre-test was conducted, with five respondents (41,6%) achieving a rating of 1 (very poor/did not appear) and seven respondents (58,3%) achieving a rating of 2 (poor/to a little extent).

When the post-test was conducted the respondents showed a significant decrease in their anxiety levels. This is indicated by the fact that none of the respondents achieved a rating of 1 (very poor/did not appear). Furthermore, four (33,3%) of the respondents achieved a rating of 4 (good/to a great extent) and 5 (very good/completely) respectively, indicating that their anxiety was eliminated.

#### 6.4.4.7 Avoidance

The seventh area of assessment was that of “avoidance”. Avoidance can be understood as “keeping yourself away from someone or something; refrain from” (Oxford School Dictionary, 2004: 31). When observing this assessment area the researcher was focusing specifically on the respondents’ avoidance of the previous three elements mentioned namely verbal communication, non-verbal communication and social interaction. Diagram 52 indicates the pre- and post-test scores achieved by the respondents with regard to avoidance.



**Diagram 52: Pre- and post-test scores for avoidance**

As can be seen in the Diagram 52, many of the respondents showed a high level of avoidance in the pre-test: 50% of the respondents achieved a rating of 1 (very poor/did not appear) in the pre-test, indicating that the behaviour of avoidance was present.

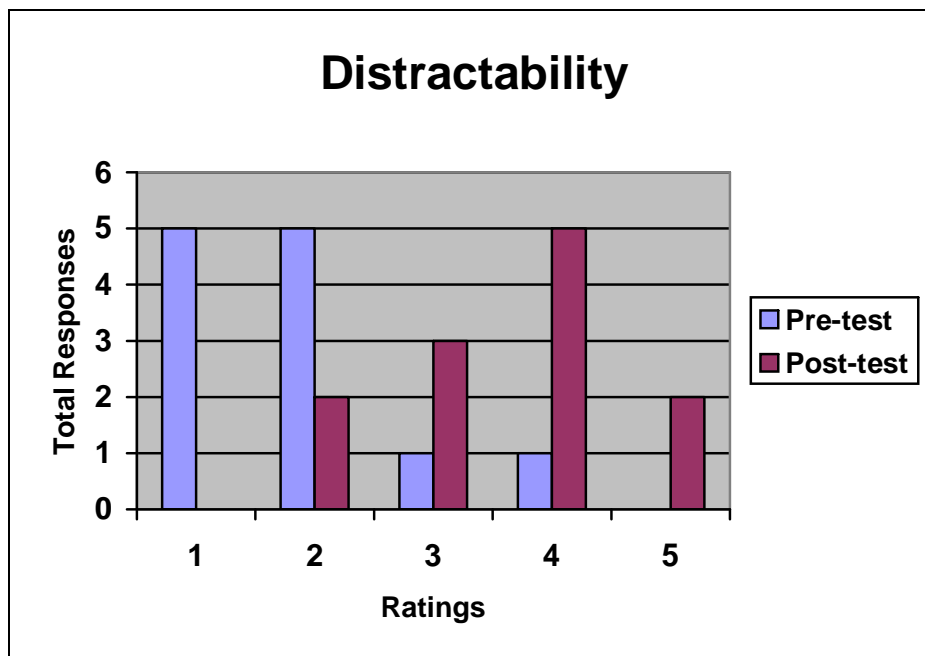
Once the intervention (the play technique programme) was introduced and completed, the respondents showed a decrease in their behaviour of avoidance. Two (16,6%) of the respondents did not show any avoidance when the post-test was conducted, achieving a rating of 5 (very good/completely), and five (41,6%) of the respondents showed a highly significant decrease in their degree of avoidance, achieving a rating of 4 (good/to a great extent).

#### 6.4.4.8 Distractibility

The final area of assessment, with regard to challenging behaviour, was “distractibility”. Distractibility is defined as “take attention away; distracting a

person's attention" (Oxford School Dictionary, 2004: 136). As previously mentioned, autistic individuals do battle with concentration and this has a direct impact on their distractibility.

Diagram 53 showed the combined pre- and post-test scores achieved with regard to distractibility.



**Diagram 53: Pre- and post-test scores for distractibility**

When the pre-test was conducted the majority of the respondents (83%) battled with being distracted, as can be seen in the fact that five (41,6%) of them achieved a rating of 1 (very poor/did not appear) and five (41,6%) a rating of 2 (poor/to a little extent).

The post-test scores show that significant improvement took place. The most obvious changes can be considered to be the fact that none of the respondents achieved a rating of 1 (very poor/ did not appear), five (41,6%) were able to obtain a 4 (good/to a great extent) and two (16,6%) a 5 (very good/completely).

This indicates that the respondents' distractibility was minimized through the use of the play technique programme.

Table 16 summarizes the scores achieved by presenting a frequency distribution of the respondents' combined ratings according to their challenging behaviour, by utilizing a pre- and post-test.

**Table 16: Frequency distribution of respondents' ratings regarding Challenging Behaviour**

Assessment areas	CHALLENGING BEHAVIOUR									
	Pre-Test					Post-Test				
	Very poor/ did not appear	Poor/ to a little extent	Average/ to some extent	Good/ to a great extent	Very good/ completely	Very poor/ did not appear	Poor/ to a little extent	Average/ to some extent	Good/ to a great extent	Very good/ completely
Repetitive behaviour	6	3	1	2	-	2	1	6	2	1
Inappropriate behaviour	5	2	3	2	-	-	2	4	3	2
Self-injurious behaviour	1	1	1	8	1	-	2	2	1	7
Aggressive behaviour	-	3	4	5	-	-	2	2	2	6
Agitation	4	5	3	-	-	-	3	3	3	3
Anxiety	5	7	-	-	-	-	2	2	4	4
Avoidance	6	-	5	1	-	-	1	3	3	5
Distractibility	5	5	1	1	-	-	2	3	5	2
<b>Total</b>	<b>32</b>	<b>26</b>	<b>18</b>	<b>19</b>	<b>1</b>	<b>2</b>	<b>15</b>	<b>25</b>	<b>23</b>	<b>31</b>

Table 16 summarizes the ratings achieved with regard to challenging behaviour as follows, by focusing on the total scores achieved for each rating in the pre- and post-test:

- All the children included in the study indicated some form of challenging behaviour, which is indicative of the diagnosis that they have received.

- The type of challenging behaviour that was evident was different with each child, with some children showing a combination of the challenging behaviours.
- The researcher feels that it is important to note that when the pre-test was administered it was the children's first encounter with the researcher, and this could have possibly caused an increase in the respondents' challenging behaviour. This would have had an impact on their ratings.
- There was a definite decrease in challenging behaviour when the post-test was conducted. This can be seen in the increase of a rating of 4 (good/to a great extent) or 5 (very good/completely), with a total combined increase of 34 points.
- Although there was a definite improvement, the children still displayed challenging behaviour, as can be seen in the majority of the ratings being 2 (poor/to a little extent) and 3 (average/to some extent).

Table 17 presents the median scores for the respondents' challenging behaviour/s.

**Table 17: Median scores of respondents' ratings with regard to Challenging Behaviour**

Class		1	2	3	4
Number of respondents		3	2	2	5
Median	Pre-Test	1.750000	2.6250000	1.3750000	2.5000000
	Post-Test	3.1250000	3.4375000	3.0625000	4.5000000
Minimum	Pre-Test	1.6250000	1.6250000	1.1250000	2.3750000
	Post-Test	2.3750000	2.2500000	2.5000000	3.5000000



<b>Maximum</b>	Pre-Test	3.2500000	3.6250000	1.6250000	2.8750000
	Post-Test	4.3750000	4.6250000	3.6250000	4.6250000
<b>Interquartile deviation</b>	Pre-Test	0.8125	1	0.25	0
	Post-Test	1	1.1875	0.5625	0.25
<b>Range</b>	Pre-Test	1.6250000	2.0000000	0.5000000	0.5000000
	Post-Test	2.0000000	2.3750000	1.1250000	1.1250000

The Wilcoxon Signed-Rank Test for a Paired Experiment (Wackerly, Mendenhall & Scheaffer, 2002) was used to test the statistical significance of these results. The test criterion on a 1% level of significance allows for the null hypothesis to be rejected if the p-value is less than ( $<$ ) 0.01. The null hypothesis ( $H_0$ ) states that the intervention had no effect. The alternative hypothesis ( $H_1$ ) states that the intervention did have an effect.

With regard to challenging behaviour/s the following results are yielded by the Wilcoxon Signed-Rank Test for a Paired Experiment. The test statistic given is 0.0 and the p-value is 0.00025, therefore leading to the following conclusion:

- 0.00025 is less than 0.01%, which is considered the level of significance;
- Therefore the null hypothesis is rejected;
- The alternative hypothesis is accepted;
- This allows the conclusion that the intervention (the play technique programme) had a highly significant effect on the challenging behaviour/s of the respondents.



### 6.4.5 Collective Summary of Social Behavioural Changes

Up to this point the focus has been on each individual social behavioural skill. It is now necessary to give an overview of the combined skills achieved, focusing on the general social behaviour of the respondents and the changes that took place.

Social behaviour is defined by Answers.com (2005) as “behaviour directed at other people ... it is more advanced than behaviour or an action”. Google (2005) states that social behaviour is “how the person interacts with others (e.g. habituated body signals; general voice characteristics; style of speech; visible handicaps)”.

Table 18 summarizes the four areas focused on within the self-constructed measuring instrument, with a combination of all the respondents’ scores represented.

**Table 18: Combination of ratings for social behavioural skills**

Skills	Pre-Test					Post-Test				
	Very poor/ did not appear	Poor/ to a little extent	Average/ to some extent	Good/ to a great extent	Very good/ completely	Very poor/ did not appear	Poor/ to a little extent	Average/ to some extent	Good/ to a great extent	Very good/ completely
Verbal communication	63	25	35	9	0	40	19	35	31	7
Non-verbal communication	45	47	37	3	0	5	23	59	35	10
Social Interaction	49	48	36	11	0	3	26	60	37	18
Minimizing challenging behaviour	32	26	18	19	1	2	15	25	23	31
<b>Total</b>	<b>189</b>	<b>146</b>	<b>126</b>	<b>42</b>	<b>1</b>	<b>50</b>	<b>83</b>	<b>179</b>	<b>126</b>	<b>66</b>

The following is therefore clear:

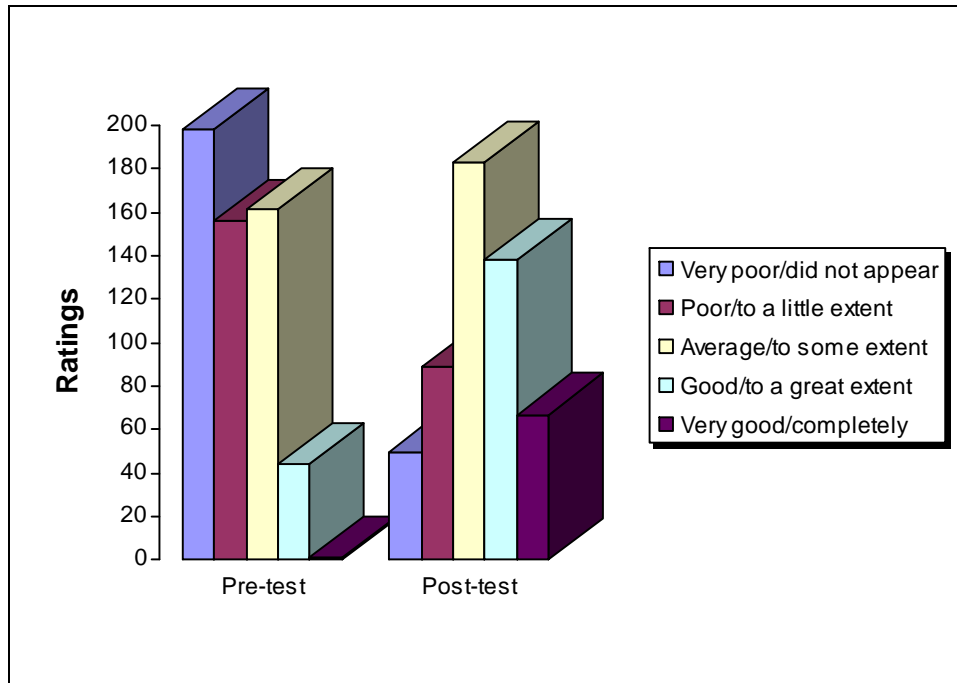
- In relation to all the elements of social behaviour focused on there was an improvement of some kind, as a comparison of the pre-test and post-test scores reveals. This can be seen in Table 19 as well.

**Table 19: Comparing pre-test and post-test scores**

Rating	Pre-test	Post-test
1	189	50
2	146	83
3	126	179
4	42	126
5	1	66

- There was a 58% decrease in the total number of 1 (very poor/did not appear) ratings and a 27% decrease in the total number of 2 (poor/to a little extent) ratings.
- There was a 17% increase of respondents managing to score a rating of 3 (average/to some extent).
- A great deal of improvement was seen with regard to a rating of 4 (good/to a great extent), with a 50% increase.
- However, the greatest range of improvement can be seen in the respondents achieving a rating of 5 (very good/completely), with a 98% improvement.

Diagram 54 presents this information graphically.



**Diagram 54: Combination of ratings for social behavioural skills**

The diagram shows that there was a large drop in respondents scoring a 1 or a 2, and a large increase in respondents scoring a 4 or a 5, when comparing the pre- and post-test results. This indicates a positive level of improvement with regard to the social interaction skills that were focused on.

## 6.5 Summary

In this chapter the researcher presented the empirical data that was gathered throughout this study.

The focus was firstly on the biographical details of the respondents involved in the study, such as their age, gender, home language and race.



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Attention then shifted to the results of the empirical data, which focused on the social behaviour skills of the respondents, namely verbal communication, non-verbal communication, social interaction and challenging behaviour.

The empirical data clearly shows the progress that took place after the completion of the intervention, namely the play technique programme.

The final chapter, Chapter 7, will summarize the study and present its conclusions and recommendations.