The effect of the Ron Davis programme on the reading ability and psychological functioning of children

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ABSTRACT

The purpose of this study was to ascertain whether certain Ron Davis techniques that have been applied by the *Davis Dyslexia Correction Center* in America the past two decades could, in the short term, have a significantly positive influence on the reading ability and psychological functioning of children with a reading disorder, especially regarded against the background of escalating concern about the reading ability of South African learners in general and learners with a reading disorder in particular.

A review was done on the different approaches regarding intervention programmes, the psychological models underlying the Davis techniques, possible causes of a reading disorder and its influence on the self-image of children with a reading disorder.

Twenty Afrikaans-speaking learners in grade 5 to 7 from a school for children with special educational needs in the Western Cape were randomly assigned to an experimental and a control group. These children had all been diagnosed with a reading disorder. The participants from both groups were then pre-evaluated by means of four measuring-instruments to determine their reading and spelling levels, and parents as well as educators were asked to fill out psychological questionnaires beforehand so that the participants' psychological functioning could be ascertained.

The participants of the experimental group were then subjected to an intervention programme based on certain Davis techniques. It comprised of seven weekly sessions of two hours each. The control group received no intervention. After the intervention the participants of both groups were again evaluated by means of the same four measuring-instruments and the parents and educators were asked to fill out the psychological questionnaire once again.

The parents and educators were also asked to fill out demographic questionnaires set by the researcher and a structured interview based on a similar questionnaire was held with participants of the experimental group. This information was used to draw up a psychological profile of children with a reading disorder.

Data analysis was done by means of two non-parametric tests, namely the Mann-Whitney U Test and the Wilcoxon Signed-Rank Test. The results of the Wilcoxon test indicated that the experimental group's reading and spelling ability as well as psychological functioning had improved significantly. Follow-up tests were performed 12 weeks later and the results showed that the improvement had been maintained although 70% of the participants had not tried to carry on with the programme on their own.

The assumption can thus be made that over a short term the Davis techniques had a positive effect on the reading and spelling ability of the participants and on their psychological functioning. The effect had furthermore been maintained after the intervention.

This opens up this field of study to further research. It also indicates that Davis techniques should be acknowledged as an alternative intervention in the field of learning problems, especially against the background of the escalating incidence of reading problems among and the impact thereof on children and adults in South Africa, as well as universally.

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CHAPTER 1

INTRODUCTION, MOTIVATION, GOALS, TERMINOLOGY AND RELEVANT LITERATURE

1.1 Introduction and motivation

Lots of people are unable to see all kinds of truths
right in front of their eyes (Koontz, 2003, p.498)

Reading is a development task that every child in today's society has to be able to master. Today children are being made aware of sounds, letters and words as early as the age of 5 years in order for them to find reading easier when they get to grade 1. From grade 1 to grade 3 children are taught how to master reading and to read fluently. From grade 4 onwards *learning to read* changes to *reading to learn* (Shaywitz, 2003). This means that at the age of 9 years a child should be able to read fluently, make headway in a scholastic sense as well as be able to read for pleasure. Unfortunately there are many children who struggle with this task and it means that they are largely at risk of suffering serious developmental problems, such as low self-esteem as well as anxiety, emotional and behavioural problems.

According to Sadock and Sadock (2003) 5% of America's school-going population have a learning disorder and a reading disorder is apparently the most prevalent form of these learning disorders. In 1998 the *Committee on Preventing Reading Difficulties in Younger Children* of the *National Research Council* determined that the educational career of 25 to 40% of American children was being threatened because they could not read fast or well enough (Shaywitz, 2003). According to Shaywitz (2003) the *Connecticut Longitudinal Study* determined that more or less 20% of children have a learning disorder. Mash and Wolfe (2002) also indicate that most estimates of the prevalence of learning disorders are based on the prevalence of a reading disorder, not only because it is by far the most common learning disorder but also because it often goes hand in hand with a mathematics and/or writing disorder. According to Sadock and Sadock (2003) adolescents with a learning disorder, furthermore, stand a 40% chance of not completing their school career. Adults with a learning disorder have a greater chance of developing career or social problems. This also relates to the incidence of major depressive disorder and dysthymic disorder (Sadock & Sadock, 2003).

In South Africa reading problems have been reaching alarming proportions (Sylvester, 2001; Williams, 2002). Researchers at the Holman Institute, in collaboration with the Independent Examination Board, have studied the outcomes-based standards to assess the system introduced by Curriculum 2005. Their report's conclusion was that the system does succeed in certain areas and that learners handle oral questions well, but they do not cope with the written word. According to Williams (2002) reading problems can also be blamed on insufficient pre-school education, education that is not provided in the mother tongue of the child, poor school education and overcrowded classrooms. Holman (quoted in Sylvester, 2001) says that learning success is a good predictor of managerial and professional success and that serious damage can be done to the effectiveness of future professional and managerial manpower in South Africa if something is not done about the situation.

According to the results of diagnostic tests that were written at the end of 2003 by 34 596 grade 6 learners from 1 079 schools in the Western Cape, only about a third (35%) could pass the literacy test. The testing included almost all the grade 6 learners of the Western Cape. More or less 63,3% of these

learners failed the combined numerical and literacy assessment which indicates that they did not meet the standards expected in grade 6 (Brits, 2004a, 2004b, 2004c).

With reference to these negative results the provincial minister of education, Cameron Dugmore, said that these results could be attributed to poverty, insufficient resources, education not provided in the mother tongue of the child as well as overcrowded classrooms. This is in correspondence with the observations made by Williams (2002). According to Dugmore outcomes-based education (OBE) could not be regarded as the cause of these results. To motivate his statement he mentioned that 64,2% of the children who came from affluent homes, passed and only 0,9% of the very poorest. Furthermore, the results of former model C schools were good but they only constituted a very small part of the total population (Brits, 2004a, 2004b, 2004c).

On account of these results many other experts expressed the opinion that overcrowded classrooms could well have contributed to these poor results, but that the way in which the new curriculum was being implemented, had to carry most of the blame. Their opinion regarding the way in which reading was being instructed, was that it had been a very big mistake to replace the phonic method by the holistic method. According to these experts the holistic method should rather be regarded as supplementary to the phonic method (Brits, 2004c, 2004d). Another contributing factor mentioned is the fact that remedial education has been phased out. Although the department of education had plans to reinstitute remedial teachers, there would still not be sufficient numbers because the idea was to have one teacher for about every three schools (Brits, 2004d).

Hugo (quoted in Rademeyer, 2004b), the national director of the *Read Educational Trust* (Read), maintained that between 6 and 8 million South Africans could not read or write. She also said that learners cannot do well academically if they cannot read or write. Rademeyer (2004b) referred to the findings made by researchers of the University of South Africa (Unisa) that the literacy skills of only about 39% of South African learners in grade R met with school-readiness criteria and 30% of the literacy skills of grade 9 learners did not meet with the demands of passing grade 12 successfully.

Shaywitz (2003) mentions that reading problems most probably do not occur due to specific cultural or regional phenomena, but that they rather are the expression of a bigger universal vulnerability since they appear across all nations. Learning disorders know no boundaries – neither geographically, nor ethnically or intellectually. It could therefore be derived that the problems of learners with a reading problem within the South African context could actually be exacerbated by additional factors such as insufficient pre-school education, education not given in the mother tongue of the child, poverty, insufficient resources, poor school education, overcrowded classrooms and also the unsatisfactory implementation of Curriculum 2005 which implicates educational methods.

According to Raskind (quoted in Broatch, 2003) the psychological influences that reading problems have on the child are much more distressing than the educational challenges. Many children with reading problems experience strong feelings of frustration, anger, sorrow and shame that could lead to psychological problems such as low self-esteem and depression, as well as conduct problems such as substance abuse and juvenile delinquency. In addition they often experience social problems that can exacerbate their low self-esteem (Broatch, 3003). Williams (2002) supports these opinions by adding that the conduct of learners who have not acquired the necessary reading skills often becomes destructive. With good reason Levine (2002) is of the opinion that failure can injure a child's psyche. The self-concept

of children with learning problems can suffer even when these children receive support and encouragement (Broatch, 3003).

In spite of the opinions of experts regarding language instruction there somehow does not seem to be consensus about the way in which reading-intervention programmes should be constructed. Shaywitz (2003) for instance maintains that sounds should be taught systematically and explicitly, not randomly or subtly. She says the holistic method concentrates on meaning and that supporters of this method assume reading is acquired naturally. According to Shaywitz reading is not a natural process but it is a skill that is mastered with difficulty. Whole-language interventions involve holistic, meaning-orientated activities and reading is regarded as integrated behaviour rather than behaviour divided into a collection of separate skills (Mercer, 1992).

The *Orton-Gillingham Institute for Multi-Sensory Education* in America focuses on each student's visual, auditive and kinesthetic developmental pathways to maximise mastery and retention (Drake, 1999). This institute also uses systematic phonic instruction.

Stowe (2000) says that there is not a standard way of intervention and that each student has to be assessed separately. Then a special programme has to be constructed for that individual. She adds that there should not be too much reliance on explicit phonic instruction, especially not to the exclusion of the whole-language (holistic) concept.

The basic method of approach used by Bell (quoted in Stowe, 2000) is that the individual should be able to create visual images to understand spoken and written language

Amidst all these different programmes and points of view there is the *Davis Dyslexia Correction* programme of Ron Davis (1997, 2003) that originated in 1984 in California and at present is being applied worldwide by facilitators in six different languages. What separates this approach from others is the fact that students are guided verbally and visually to obtain an orientation point which is for example reminiscent of the guided-imagery techniques described by Grové (1991, 1994, 1996, 1999).

According to Davis (1997, 2003) people with reading problems read differently in the sense that they see things around them from different orientation points - an attribute that stands them in good stead in the world of concrete images but lets them down when they have to interpret images that are one or two dimensional, such as writing. Then they "disorientate." He worked out how this disorientation could be stabilised when it for example comes to reading, and this forms the basis of his technique that he calls *Orientation Counseling*. As soon as a student has learned to stabilise his/her disorientation, multisensory techniques are used to further correct the reading problem. According to anecdotal reports and other data obtained from the website, http://www.dyslexia.com, the Davis programme has a success rate of more than 90% and empowers people of all age groups to control their reading problems.

One longitudinal study (Pfeiffer et al., 2001) of five years indicated that all learners, not only those suffering from a reading disorder, could benefit from the *Davis Learning Strategies*. The Davis *Alignment Procedure* was adapted to serve as complement to the curriculum in the grade classes (age 5 to 9 years). The purpose of this technique is to prevent any younger child from lapsing behind and is not aimed at the learner who already has problems due to a diagnosed reading disorder.

These *Davis Learning Strategies* were tested on 86 preprimary-school learners (grade K-1) in the San Francisco Bay-area and the Davis reading strategies were used to ascertain whether children would benefit from them regarding sight-word skills. *Symbol Mastery* techniques were mainly used, but the learners were also taught how to focus (*Focusing*). The latter is a group activity presented by the educator. The outcome was that children who followed the programme did significantly better in grade 1 than the control group concerning the mastery of 100 sight words. Follow-up data also indicated that not one of the experimental group's learners was referred for special education within 2 years and, furthermore, the referral of gifted children from this group was significantly higher than from the typical school population. It is therefore clear that even learners who do not have a reading disorder may benefit from the Davis techniques. According to the *Davis Dyslexia Association International* there are educators in South Africa who have received training in these strategies although no South African publications were available in this regard.

Fran Thompson, president of the *International Dyslexia Association, B. C. Branch,* has spoken out against systems that are not scientifically founded. She recommended that Davis document his alleged 90% success (quoted in Stainsby, 2001). At this stage there is the aforementioned American study (Pfeiffer et al., 2001) as well as other statistical data. No other completed studies have been published in a peer-reviewed journal concerning Davis's *Orientation Counseling* and its effect on learners with a learning disorder – the core of his whole approach.

Marshall (1999) wrote in her review of the Davis programme that Davis's book *The gift of dyslexia* (1997), was written due to the fact that educationists and established dyslexia organisations who were contacted by Davis, rejected this new and innovative approach to dyslexia. They would not investigate his methods or apply them.

Due to the abovementioned fact it seemed viable to do research about the Davis techniques in order to ascertain whether the positive results claimed by Davis were indeed scientifically significant. Should the techniques prove to be of scientific value, it would mean that individuals with a reading disorder as well as at-risk learners would have a alternative intervention programme to their disposal.

1.2 Broad research goals

The goals of this study were:

1.2.1 to compile a personality profile of the child with a reading disorder,
1.2.2 to ascertain whether the Davis programme can improve the reading ability of children with a reading disorder in the short term, and
1.2.3 to ascertain whether the psychological functioning of these children improves if their reading problems are diminished.

1.3 Terminology

The term *learning disorder* was introduced in the fourth edition of the *Diagnostic and statistical manual of mental disorders* (DSM-IV) of the *American Psychological Association* (APA) and in the text revision (DSM-IV-TR) four diagnostic categories were added (quoted in Sadock & Sadock, 2003). The term *learning disorder* overall refers to deficits in children or adolescents concerning the acquisition of reading, writing, speaking, listening, reasoning and mathematical skills in comparison with other children/adolescents of

the same age and the same intellectual capacity. The diagnosis of any learning disorder at present requires the learner's performance regarding the specific disorder to be significantly lower than expected and it has to interfere with academic performance or daily activities.

The DSM-IV-TR (quoted in Sadock & Sadock, 2003) defines *reading disorder* specifically as a reading performance that lies beyond the expected level of performance in comparison with children of the same age, education and intellectual capacity. It interferes significantly with academical success and daily activities, such as reading. If a neurobiological condition or sensory disorder is present, the manifestation of the reading disability is worse than would be expected. A learning disorder is thus diagnosed when a child's learning performance is significantly poorer than would be expected from a child of the same age and the same intellectual abilities.

This disorder can be distinguished by the individual's inability to recognise words, slow and inaccurate reading and poor comprehension. Children with a reading disorder make many mistakes when they read out loud and their reading is especially characterised by omissions, additions and distortions. They have problems with the printed as well as the written word. Most of them can copy text just as well as their peers, but they spell very poorly. Other problems include affected sound-discrimination and the correct sequencing of words. They also turn or change around letters due to a poorly established left-right following sequence and cannot recall letter names and/or sounds very well. Most of these children inevitably do not like reading and avoid it as much as possible. They become anxious when they have to execute assignments that entail written or printed language. This disorder causes humiliation, shame and frustration due to the constant failure. The older children get without being diagnosed and receiving intervention, the more they manifest low self-esteem, anger and depression. A reading disorder can usually be diagnosed before grade 2, but some children depend on their memory to hide it, especially if they are highly intelligent. Some succeed in acquiring some measure of knowledge about the printed word in the lower grades, but from grade 3 onwards they struggle keeping up with their peers. A few are only identified in grade 4 and even later. It is possible to diagnose a reading disorder as early as grade 1 and if early intervention is started, the problem can be curtailed before the end of grade 2. More serious cases might, however, need intervention until they are in high school (Sadock and Sadock 2003). A reading disorder can coincide with a mathematics disorder, a disorder of written expression, an expressive language disorder and also an attention-deficit/hyperactivity disorder (AD/HD), although children who are diagnosed with the latter do not always have a language disorder.

When Davis refers to dyslexia (1997, 2003) it indicates a learning disorder and not simply a reading disorder. Lichtman (2001) indicated that Davis uses the term dyslexia as a term covering anything that prevents a child or grownup from developing his/her full potential and this includes, among others, reading, writing, mathematics and co-ordination. As far as this study is concerned only the reading ability of learners was researched, since it is the most prevalent disorder and the other disorders usually coincide with it.

As far as *psychological functioning* is concerned it refers to anxiety levels, feelings of depression or detachment, somatic complaints, social problems as well as affective, mental and behavioural/conduct problems, hyperactivity and attention deficit, aggressive behaviour and the rule-breaking. It therefore also refers to the extent to which problems are internalised or externalised.

1.4 Relevant literature

Davis (1997, 2003) believes that dyslexia (as he calls it) is the result of an inborn gift or talent. It coincides with imagination and creativity, with problem solving by looking at the bigger picture rather than by means of a step-by-step analytical process. As far as this is concerned, he is supported by Gorman, Cuadros, Land, Scully and Song (2003), Levine (2002), Shaywitz (2003) and Stowe (2000). Levine (2002) for instance remarked that many learners with learning problems have creative tendencies and they undertake imaginative ventures. Gorman et al. (2003) said that there are many individuals with dyslexia among top artists, scientists and entrepreneurs. According to Davis, individuals with dyslexia have a predominantly visual and non-verbal way of thinking. It is this intuitive and multi-sensory way of thinking that for instance caused Einstein to have problems at school, but also made him such a brilliant mathematician. Shaywitz (2003) interviewed quite a number of celebrities with a learning disorder and they bore testimony of this ability to think in a different way. The well-known creator of TV shows, Stephen J. Cannell, for instance told her that he has a huge struggle with the written text, but he is able to see everything he writes as though in movie-form. Charles Schwabb, who revolutionised America's financial services, said he is able to visualise the way things look at the end of the tunnel. He has the ability to conceptualise extremely well (Jones, 2003). Gorman et al. (2003) argue that it seems as though people with dyslexia have the ability to think outside the box in an unusually lateral way.

Davis's method, among other things, utilises the individual's imagination and creativity to overcome his/her learning problems. This helps them approach learning in a different way and could most probably be connected with what Levine (2002) says about the higher mental systems. He mentions that some people seem to be most gifted as far as their higher mental abilities are concerned, but they are, for instance, not able to focus or arrange things well. Shaywitz (2003) adds to this by saying that a reading disorder is a very isolated weakness and the mental and reasoning ability of individuals who have this disorder is not affected but most probably enhanced. The Davis techniques perhaps provide the focus such individuals need to utilise these abilities.

Davis's technique (1997, 2003), called *Symbol Mastery,* is based on recognised multisensory methods (Miller, 1993; Stowe, 2000), and his *Orientation Counseling* is supported by specific psychological models. According to Hartmann (quoted in Davis, 2003) Davis's programme corresponds with certain principles of neuro-linguistic programming (NLP). Hall and Bodenhamer (2000) say the NLP viewpoint is that the human brain can be programmed like computer software. According to O'Connor and McDermott (quoted in Craft, 2001) people react to their map of reality and not to reality itself. They function and communicate according to this map. NLP is the art of changing this map and not reality. It provides the individual with the chance of controlling what is considered to be automatic neurological processing (*What is Neurolinguistic Programming ™?*, 1996).

Several NLP processes are based on the use of the imagination. Dilts (1998) proposed that by using the imagination and creating images, a person's neurological functions can be stimulated into a certain direction and self-organising processes can be set off that will automatically and subconsciously start working at the imagined. Grové (1999) relates to this when she says that the human brain does not discriminate between imaginary experiences and something that happens in actual fact. By means of visualisation and relaxation an individual can succeed in gaining control of his/her life (Grové, 1991). She refers to the example of the Bulgarian psychiatrist, Georgi Lozanov, who used various methods to teach

people a foreign language within 10 days. One of these methods was positive programming of the brain and this is basically the principle on which Davis's *Orientation Counseling* is founded.

Perception is the sensory observation of something in the environment and it leads to an internal image of the object (Sternberg, 1999). Sometimes an existing object cannot be perceived and sometimes an object that does not exist can be perceived (perceptual illusion). This means that what is perceived by human sensory organs, is not necessarily perceived by the mind. The human mind takes the available sensory information and manipulates it in a certain manner to create concepts in the mind of objects and spatial relationships in the environment. Davis (1997, 2003) proposes that orientation mainly has to do with perception. You are orientated when you are aware of your place and position by using all your modalities. If you are aware of the place of something in your environment you can place yourself in the correct spatial relationship with it providing your perceptions are accurate. According to Davis orientation therefore refers to the accurate observation of the environment. Hence the possibility exits that individuals with a reading disorder struggle to read because they disorientate when symbols do not make sense to them. Disorientation leads to the perception of a false reality.

Davis (1997, 2003) pays heed to the fact that there are two ways of conceptualising, namely verbally (by means of symbols) and non-verbally (by means of visual images). Levine (2002) confirms this. Most adults use both in some way or another but the verbal way is acquired and develops together with language development. The language development of children with dyslexia is often slow. Shaywitz (2003) substantiates this. Davis (1997, 2003) comes to the conclusion that the verbal conceptualisation of children with dyslexia develops slowly. Children with dyslexia use baby language much longer than children who reach their developmental milestones within the normal boundaries and their language also become intelligible at a later stage. This is confirmed by Shaywitz (2003). Davis (1997, 2003) reaches the conclusion that the verbal conceptualisation of children with dyslexia develops slower. Non-verbal thought is an innate characteristic of man and starts being used as soon as a child is born. It however has its limitations. And the problem lies in its construction. It can entail any element of a whole series of human perceptions (colour, form, sound, emotions, the perception of movement and touch, taste and smell). It usually also takes place on a subconscious level. A person can slow it down, but most often it takes place at such a pace that it usually feels as though conclusions and deductions have been made intuitively.

As has been mentioned previously, Davis (1997, 2003) says that people with dyslexia mainly think non-verbally. Because they think in "pictures" they usually excel at strategic planning, creative projects and insight into problems in the work environment, but they struggle with word-based, linear, step-by-step reasoning. They usually have vivid imaginations and if they do not understand something, they "disorientate" in order to be able to look at it from different perspectives in their mind. They learn to disorientate early in life and use it when they receive confusing sensory information or when they are busy with creative problem solving. This is, however, also the foundation of their reading problems. When they "disorientate", their perception of the reading symbols with which they are busy, becomes distorted. Because reading has so many confusing sources, they disorientate spontaneously. This once more corresponds with the NLP point of view that one of mankind's sensory channels of input is distortion, meaning that the human brain sometimes makes shifts when it experiences sensory data by misrepresenting reality (James, 1998). The confusion takes place because there are no images for the symbols. This concerns not only visual but also auditory inputs (Davis, 1997, 2003). Stowe (2000) supports this viewpoint by saying that learners with dyslexia sometimes experience visual confusion that

causes them to be unable to discriminate between small differences in letters. Shaywitz (2003), furthermore, says that learners often struggle with sight words because they are not supported by concrete images.

According to Shaywitz (2003), who recommends the phonic model, learners with reading problems often struggle with sight words (she calls them function words), such as *on* and *under*. They do not struggle with words that portray concrete images, since function words usually cannot be derived from the reading context, but the latter can indeed be. The learner guesses words by means of the context. Stowe (2002) adds that learners often guess words that have little inherent meaning to them. This also has a bearing on Davis's idea that these learners do not struggle with words they cannot visualise, but rather with words that do not have any concrete meaning for them, such as many sight words.

A significant aspect of Shaywitz's (2003) intervention programme is what she expects of a successful intervention programme. This entails early intervention and intensive high-quality education that lasts long enough. If a child does not receive intervention at an early stage, he/she will need 150 to 300 hours of intensive study. This means 90 minutes per day for a period of 1 to 3 years. The educator has an influence on the results and has to be well qualified. It is hard work to teach a child with dyslexia and a lot of interaction is needed to keep his/her attention. Gorman et al. (2003) support her opinions.

The Davis programme (1997, 2003) does not take up all that much time and could therefore also be cost-effective. It normally entails a week of intensive intervention, 6 hours per day, in other words 30 hours. The individual who receives the intervention can control his/her own reading focus after the intervention.

Programmes that are based on phonic instruction usually rely heavily on intensive training and repetition to strengthen the neural pathways. Hereby reading ability is embedded and rendered automatic and subconscious. Shaywitz (2003) works on the assumption that practice helps improve the talent of athletes and artists to develop and that it therefore should also help the person with dyslexia. According to Davis, drill work and repeated exercises seem to children with dyslexia who are disorientated as though they are being forced to practise something they precisely do not have. They think in a different way and these repeated exercises simply exacerbate the reading situation. Repeated exercises wear the child with dyslexia down because he/she disorientates. Davis's techniques teach individuals how to control their mind and how to orientate. Davis assumes that individuals with dyslexia can be taught how to come out of the state of disorientation and then they can be shown how to master symbolic information.

1.4.1 The causes of reading problems

It seems clear from literature that there are various viewpoints regarding the causes of learning disorders and therefore reading disorders.

Sadock and Sadock (2003) quote from the DSM-IV-TR that there are different possible causes of a reading disorder, among others a genetic predisposition, prenatal, perinatal and postnatal complications, neurological conditions such as weaknesses in encoding processes and working memory, other medical conditions, right-left confusion and environmental factors such as malnutrition. Strydom (quoted in Rademeyer, 2004a) maintains the point of view that right-left confusion can largely contribute to a reading disorder. Sillin (2003) is of the opinion that deep-seated psychological reasons may be the cause. The possibility may even exist that there are no specific risk factors present regarding many children and adolescents with a reading disorder. Sadock and Sadock (2003) refer to studies with magnetic resonance

imaging (MRI) and positron emission tomography (PET) by means of which no conclusive proof could be delivered of differences regarding the brains of individuals with and those without dyslexia.

On the other hand, research done by Shaywitz (2003) with functional magnetic resonance imaging (fMRI) showed that normal readers do not use the same areas of the brain during reading as readers with a reading disorder. There is activity in the left hemisphere of normal readers' brains and readers with a reading disorder show activity in their left as well as right hemispheres. Shaywitz says the poor reader's left-brain structures concerned with word analysis and the automation of reading (the parietal-temporal area and the occipital-temporal area) are underactive during reading activities. According to her this supports the hypothesis that these individuals' problems are of a phonic nature. Her explanation of the active right-brain structures is that it might point to alternative secondary developmental pathways, while it might just be in keeping with Davis's opinion that these learners think three-dimensionally and non-verbally. There is a general assumption that the right brain's functions, among others, deal with visual-spatial tasks and with the holistic and concurrent processing of information (Miles & Miles, 1990).

According to Thomson (quoted in Miles & Miles, 1990) children who are taught *kanjis* (writing in pictures) in Japan, have fewer reading problems than those who are taught *kana* (phonic symbols). This is in keeping with what Davis says about children with reading problems. Davis (2003) is of the opinion that the anomalies found in poor readers' brain imaging, could possibly be the *effect* of *how* they think rather than the *cause* of it.

Experts such as David Heeger (quoted in Stowe, 2000) think that the complete answer might not lie in thinking of dyslexia simply as a matter of the language centre of the brain. There may still be many undiscovered factors.

There is, however, consensus about one thing among all the abovementioned researchers and organisations providing programmes, namely that reading problems can be corrected without physical intervention (such as eye exercises) or chemical interventions. Davis is of the opinion that individuals' abilities and latent talents should be used to help them overcome these problems.

1.4.2 Reading problems and self-image

According to Pelser (quoted in Van Wyk. 1991) learning problems have different effects on children. He particularly refers to the child's self-confidence and self-esteem. Children evaluate themselves as inadequate if they repeatedly fail academically and especially because others are aware of this, such as their parents, educators and friends. It contributes directly to the formation of their self-image and usually it is unrealistic. If they do not receive help in time, it can worsen and can render them overly sensitive to criticism and reprimands.

A child's self-image already starts forming in early childhood (Botha, Van Ede, Louw, Louw & Ferns, 1999). Children start realising that they have certain skills and preferences that they have to meet certain social demands and they also develop ideas about the way they would like to be. Pelham and Swann (quoted in Newman & Newman, 2003) say that the human being is constantly evaluating every aspect of the self and awards it a certain worth, for instance the physical, active, social and psychological self. They also mention the fact that this evaluation is based on three components, namely the individual's specific skills and attributes, the love, support and approval of others, and the way in which individuals regard their own specific aspects and compare it to others and also to their ideal self.

Throughout life these three components change as the individual's experiences, social demands and influences change (Botha et al., 1999). Early affective experiences have an important influence in the child's general feeling of worth and worthlessness (Newman & Newman, 2003). Children learn from the experience of success and failure they have in their daily tasks and also from the challenges their skills are met with. It is, however, also true that specific skills have specific levels of importance for each individual. Selfworth is determined by the value a person attributes to specific skills in relation to his/her purpose in life and personal ideals. A person with a good self-image knows how to handle negative messages and possesses of the necessary strategies to minimise their influence on his/her life. But a person with a negative self-image regards failure as a sign that he/she is worthless (Brown & Mankowski; Brown & Gallagher, quoted in Newman & Newman, 2003).

During their first school years (grades 1 to 4) children often discover that their skills do not meet the demands of school life and it has a negative influence on their self-image. They are exposed to social evaluation and start realising that it is important to be accepted by their educators and friends. They start comparing themselves to others, and if they do not meet with expectations, it can lead to feelings of anxiety, depression and worthlessness, which can persevere, unless some positive intervention takes place.

Allport (quoted in Meyer et al., 2000) says that the opinions of others as well as the individual's direct experiences contribute to the formation of a human being's self-image, and especially children and adolescents are influenced by the opinions of others. Crooks (quoted in Newman & Newman, 2003) adds to this that children often depend on feedback from others in order to assess their own abilities and this includes academic performance, the remarks made by educators and the approval of parents and peers. If this feedback is positive, the attributes being praised, such as co-operation, intelligence and creativity, will most probably become part of the child's self-image. Such children will then be able to approach other challenges positively.

The opposite is equally true. Negative feedback leads to a pessimistic and antagonistic approach to challenges, such as reading. Zambo (2004) says that some children with dyslexia use disruptive behaviour as an effective strategy to avoid exposure of their inability to read and this impairs their academic development. In her qualitative research she mentions that the behaviour of children with a learning disorder is often disruptive and defying, but this is simply a way of defending themselves against the pain they suffer due to their inability to read. According to her, they feel unintelligent and defective and that is why they build up these defensive walls around them.

Davis (1997, 2003) also maintains that children with reading problems react emotionally, become frustrated, loose their self-esteem and develop a negative self-image due to repeated failure and negative feedback, such as poor academic performance, being teased by peers and pressure coming from educators and parents. Broatch (2003) adds to this feelings of loneliness, anger, sadness, denial, worry, shame and nervousness, that can lead to different psychological problems, such as anxiety, mood and behavioural/conduct disorders. Children with a reading disorder run the risk of developing anxiety; depressive and behavioural problems and they are also inclined to having problems concerning peer relationships. They also react less sensitively in ambiguous social situations (Sadock & Sadock, 2003).

Some of these negative outcomes are mentioned in the research findings of Wood, professor of neurology at the Wake Forest University in Winston-Salem, N.C. (quoted in Gorman et al., 2003). Children with dyslexia are more likely than those without to become early school-leavers, to withdraw from friends and family, to commit suicide or to go to prison where they are indeed over-represented. Broatch (2003)

supports these findings by mentioning drug abuse and juvenile delinquency as behavioural/conduct problems. Raskind (quoted in Broatch, 2003) adds that problems developed during childhood can endure into maturity. The hurt and humiliation of negative experiences during childhood can cause damage for life (Zambo, 2004).

Chandler, one of NLP's leaders, claims that NLP techniques can change feelings of depression, fear, anger, anxiousness and a negative self-image (quoted in *Beter werksituasie met neuro-linguistiese programmering*, 2004). The Davis techniques place the individual in control of processes that are usually subconscious. The person is put in control of his/her predisposition to disorientate and this can lead to more self-confidence and a better self-image (Marshall, 1999).

1.6 Overview

Reading problems occur worldwide, but especially in South Africa where it seems to be escalating. Although there are intervention programmes that deliver positive results, many of them are time-consuming and demand particular characteristics, skills and inputs of the educator who applies them. The Davis programme, grounded by the NLP model, is an intervention programme about which many positive anecdotal reports have been made. A scientific study has also been done about the Davis school programme (*Davis Learning Strategies*) and this has rendered positive results as well. However, no other completed studies have been published in any peer-reviewed journal as far as the principles and the steps are concerned that form the core of his programme. Since a reading disorder can have such a hugely negative influence on an individual's reading ability, academic performance and psychological functioning, and the usual method of intervention, namely phonic instruction, is in many cases not successful, scientific research regarding the Davis programme is justified.

CHAPTER 2

RESEARCH HYPOTHESES, METHODS, PROCEDURE AND DATA ANALYSIS

2.1 Research hypotheses

The aim of the present study was to test the following hypotheses:

2.1.1 The Ron Davis method can help individuals with a reading disorder to improve their reading ability in a short period of time.

2.1.2 The Ron Davis method can make a positive contribution to the psychological functioning of individuals with a reading disorder.

2.2 Research method and procedure

2.2.1 Participants and sampling

A pretest-posttest control-group design was used. The method used to obtain participants for the study was to identify a school for children with special educational needs in the Cape Peninsula (South Africa)

with a population consisting of learners with learning disorders. The population particularly had to include learners with reading problems. It would facilitate the control of extraneous variables if the participants came from a demographic group with certain common characteristics.

Due to the fact that the research programme was a pilot study, and also since it would be labour-intensive and the population of the school where the intervention took place, was not very big, the decision was made to choose an experimental group of 10 learners that would undergo the Davis intervention and a further 10 learners for the control group. Participants would therefore consist of 20 Afrikaans-speaking learners with a reading problem in grades 5 to 7, because most of them had already previously received some kind of intervention when they were younger and still had to receive special education due to their disorder.

The criteria for inclusion that had to help control threats to the validity of the study, were the following:

i. The research group had to include both boys and girls.

ii. There had to be as many boys as girls in the group as far as possible.

iii. Their global intelligence quotient (IQ) had to be 100 or higher.

iv. The participants were not to be on any form of medication that could interfere with the intervention, such as Ritalin for attention-deficit/hyperactivity disorder or any anticonvulsive medication.

v. Learners who were often absent from school would not be taken into account.

vi. Learners who were busy with any other form of individual reading intervention or therapy, such a psychotherapy or occupational therapy, would not be considered.

The researcher composed a spreadsheet of all the Afrikaans-speaking learners in grades, 5, 6 and 7 by using class lists and obtaining information about each learner from their school files to which she had gained access. On this spreadsheet all the abovementioned criteria were indicated to help eliminate learners who did not comply with them. Teachers and school therapist were asked to help in this process. The idea was to obtain a list of learners from which a group of 20 could be assigned randomly. The participants in the experimental group and the control group would then also be assigned randomly in pairs from this group of 20. The problem was that very few of the learners complied with the criteria for inclusion and eventually only 20 were left who did indeed comply with all the criteria. Among them there were 2 with a global intelligence score of 99 and they were included.

It has to be mentioned that, due to the nature of the school, some of the learners who participated in the research project, received audio and/or transcription aid, which meant that they received aid in the form of audio-taped questions and assignments to help them with homework, other assignments, tests and examinations. It also meant that learners could answer tests and examinations on audiotape or their oral answers could be taken down by a transcriber. They therefore did not have to depend on their own reading or writing abilities. There were 4 such learners in the experimental group (40%) and 3 in the control group (30%).

As far as the first research goal is concerned, information gained from the whole group of 20 participants was used, but regarding the second and third goals, an experimental and a control group were randomly assigned. The participants were randomly assigned according to gender and grade. The gender distribution was skew. There were only 6 girls but 14 boys and therefore 3 girls and 7 boys were assigned to each group. Every second boy and girl from grades 5, 6 and 7 on the spreadsheet was assigned to the control group and the rest to the experimental group. The learners were then arranged alphabetically according to each grade and numbered from 1 t0 10 (experimental group) and 11 to 20 (control group).

In Table 1 the distribution of the two groups according to the different criteria is given. For research purposes the learners' average initial age has also been provided in months.

Table 1

Distribution of the Participants according to Research Criteria (N = 20)

		Experimental group	Control group	Total
GIRLS	Grade 5	0	1	1
	Grade 6	1	0	1
	Grade 7	2	2	4
BOYS	Grade 5	1	0	1
	Grade 6	1	2	3
	Grade 7	5	5	10
Age in months $\bar{x}$		156,70	155,40	156,05
Intelligence quotient $\bar{x}$	Verbal	94,90	98,40	96,65
	Non-verbal	111,10	109,60	110,35
	Global	103,10	103,20	103,15
Often absent		0	0	0
On medication		0	0	0
Other interventions		0	0	0

2.2.2 Measuring-instruments

The following measuring-instruments were used:

a. The standardised *ESSI graded reading and spelling test for grades 1 to 7* (ESSI reading and spelling tests) (Esterhuyse, 1997) (standardised for South Africa)

The ESSI reading and spelling tests that make up a standardised South African measuring-instrument is used to test learners' reading and spelling abilities. The rationale for this series of tests is that learners who experience reading and spelling problems also experience learning problems at school and this can adversely affect their performance and progress at school. These tests aim at measuring the variables in

an objective, reliable and valid way. The tests internally measure highly consistently. All the coefficients are higher than, 80 according to the Kuder-Richardson-formula-20. The retest reliability and the predictive reliability are both significant at the 0,01% level (Esterhuyse, 1997).

b. The *Schonell silent-reading test R4 for children up to 14 years* (Schonell silent-reading test) *(*Schonell & Goodacre, 1974)

The Schonell silent-reading test was used to obtain a comparable measurement of the participants' silent-reading comprehension skills. Although it has not been standardised for South Africa but for the United Kingdom (UK) it was included since it at least would be useful in providing an indication of the participants' silent-reading ability. It has been translated into the Afrikaans and used by South African educators for many years and is regarded as a useful instrument. No information about reliability or validity was available.

c. The *Schonell one-minute reading test* (Schonell one-minute reading test) (Schonell & Goodacre, 1974)

The Schonell one-minute reading test was used to obtain a comparable measurement of the participants' ability to read out loud. Although it has not been standardised for South Africa but for the United Kingdom (UK) it was included since it at least would be useful in providing a measure to compare the participants' loud-reading speed. It has been translated into Afrikaans and used by South African educators for many years and is regarded as a useful instrument. No information about reliability or validity was available.

d. The *ASEBA school-age forms & profiles* (Achenbach & Rescorla, 2001)

The ASEBA format for parents, namely die *Child Behavior Checklist for Ages 6-18* (CBCL/6-18), as well as the format for educators, namely the *Teacher's Report Form for Ages 6-18* (TRF/6-18), were used to determine the nature and range of the emotional, behavioural/conduct and concentration problems of the participants. The test-retest reliability is supported by an average correlation coefficient of ,90 concerning competency scales and empirically-based problem scales and also the TRF/6-18 concerning adaptability scales and problem scales. There is also strong evidence of content, criterion-related and construct validity. This psychometric instrument has been successfully used the past 15 years in various research projects completed by the Department of Psychology of Stellenbosch University (South Africa).

e. Demographic questionnaires

Parents and educators of both groups had to complete questionnaires that the researcher compiled herself (Appendices 1 en 2). A questionnaire for learners (Appendix 3), also compiled by the researcher, was used to help with a structured interview that was held with participants of the experimental group at the beginning of the intervention programme. The objective of these questionnaires was to enable the researcher to compile a profile of the child with a reading disorder. The questions in the questionnaires covered the participants' biological, academic, social and emotional history and were set by the researcher with reference to literature about reading problems (Davis, 1997, 2003; Levine, 2002; Mash & Wolfe, 2002; Sadock & Sadock, 2003; Shaywitz, 2003; Stowe, 2000.).

2.2.3 Ethical questions

The parents and learners were thoroughly informed beforehand about the research programme and what it entailed. Written consent was obtained from the Western Cape Department of Education, the school's board of management, the headmaster and parents to test the learners, to interview them, to provide them with the intervention if they should be assigned to the experimental group or to assign them to the control group. The name of the school, the names of the parents and the names of the participating learners would in no way be made known.

The researcher also undertook to make the intervention programme available to the participants of the control group should it prove to bring about a scientifically significant change if the learners and parents desired it.

2.2.4 Procedure

After a suitable school had been identified, written consent to perform the research with learners of the school had to be obtained from the Western Cape Department of Education, the headmaster concerned and the school's board of management. The necessary permission was granted and the Department of Education stipulated that no intervention was to be done during the fourth term without special permission since it could interfere with the learners' preparation for their examinations.

The following step was to identify suitable candidates and to assign them to the experimental group and the control group. All the parents were contacted to obtain their permission for the children to partake of the research programme and they all gave their oral permission. They later received letters containing all the information as well as consent forms and the questionnaires they had to complete.

All the participants were tested within the first week of the second school term (2004). They did the ESSI reading and spelling tests as well as the Schonell one-minute reading test individually and the Schonell silent-reading test in two groups, namely the grade 5 and 6 learners in one group and the grade 7 learners in the other group. Their reading responses were audiotaped and checked by an independent research assistant to control the measurement.

After the tests had been completed the intervention programme was started. The participants in the experimental group received the programme in seven sessions of 2 hours each. The Davis programme, as mentioned previously, usually entails a course of 5 days, more or less 30 hours, but for the purpose of this intervention certain procedures were excluded and the programme was adapted to only concentrate on reading problems.

Only certain Davis techniques were used. These were obtained from two sources, namely *The gift of dyslexia* (Davis, 1997) and *The gift of learning* (Davis, 2003). The researcher obtained permission from the *Davis Dyslexia Association International* beforehand to do the research. The researcher was not a registered Davis facilitator, but merely used the techniques as they are explained in the two sources mentioned. The all-encompassing methods used by trained Davis facilitators were therefore not used, but only the *Davis Orientation Counseling* techniques and the *Symbol Mastery* techniques that apply to reading problems. In addition the researcher had to use Afrikaans dictionaries, magazines, readers, grammatical rules and spelling rules that naturally do not form part of the Davis programme since it was initially developed for English-speaking students. These materials were used during the programme to

practise the reading skills the participants were developing. The researcher is a trained educator (Afrikaans and French), is qualified to work with learners who have special educational needs and is familiar with the Davis techniques since she successfully applied them at a primary school where she did remedial work.

The first session with the participants of the experimental group consisted of the *Davis Perceptual Ability Assessment* (an exercise that determines whether a participant is able to visualise), interviews structured by the questionnaire for learners (Appendix 3), *Orientation Counseling* (that shows a participant how to remain orientated), and the *Review* and *Release* procedures (techniques that help the participant to relax and to maintain focus). All the participants of the experimental group proved to be good candidates for the programme and this meant that the sample size was not influenced by the fact that certain participants could not continue with the programme.

The purpose of the interview (structured by the questionnaire) was to obtain the learners' perspective of their situation and to collect information to help with the compilation of a profile of children with a reading disorder (goal 1).

The remaining six sessions briefly consisted of the following:

i. *Fine tuning* (to set the orientation point as well as possible) and *co-ordination therapy* (exercises that help with left-right co-ordination).

ii. Work with dictionaries, different fonts in magazines and readers, and writing exercises.

iii. *Symbol Mastery:* Working with modelling clay and remastering in a multisensory way the alphabet (upper and lower case), punctuation marks, numerals and sight words that cause problems. It is the mastery of words for which there are no images in the mind of a person with dyslexia and it helps to install sequencing and conceptual skills. According to Marshall (1999) it is not merely a multisensory method but it involves the individual's creativity and helps to establish long-lasting images of the specific word, together with conceptualisation and long-term retention of spelling and the meaning of words. It also helps to prevent the individual from disorientating in future. It can be used for the rest of an individual's life.

iv. Reading exercises: The Davis programme uses very specific exercises to help individuals with visualising and decoding written material.

A more comprehensive explanation of the programme is given in Appendix 4.

During the last session each participant was told how to maintain the programme at home. Each one received typed notes (Appendix 5) and were asked to work at it at least 10 minutes per day by using the *Symbol Mastery* technique to master words that cause disorientation and to use the different reading techniques as often as possible. Parents were also informed about this.

After the intervention all the participant of both groups were once again evaluated by means of the same measuring-instruments as before. The objective was to determine whether the participants of the experimental group had significantly improved regarding their reading ability and their psychological functioning compared to the control group's participants who had not received the intervention. All the

parents and educators were also asked to once more complete the CBCL/6-18 and the TRF/6-18 respectively and they could also add any written comments about the learners' progress or non-progress. The participants were re-evaluated at the end of the second term and the beginning of the third term.

The participants of the experimental group were again evaluate by means of the reading and spelling instruments after 12 weeks following the retests to ascertain whether the results had been maintained and the parents had to complete the CBCL/6-18 again. The educators were not asked to complete the TRF/6-18 again since the data of the retest had been compromised.

The parents of the control group were informed about the results and arrangements were made to tell them more about it during an information session. Should they be interested to have their own child receive the intervention after this session, the researcher would then assess these participants, do *Orientation Counseling* with them and show their parents how to continue the *Symbol Mastery* method. The researcher would do follow-up work on them every second week. Only two parents reacted and even they did not attend the information session.

2.2.5 Data analysis.

The raw scores that were used during the data analysis were as follows:

a. The Sc*honell one-minute reading test* (Schonell& Goodacre, 1974)

After the pretest, scores were obtained by determining the number of words read by the participants within one minute minus the number of errors committed. By means of these scores a participant's reading age was determined using the norm tables. The reading age in years and months was converted to months only. This was deducted from the participant's chronological age (also in months). These results then determined how many months each participant was behind regarding his/her loud-reading speed. The retest rendered the same kind of results. If a participant's retest score was *lower*, it indicated that there had been an improvement in the participant's loud-reading speed. The pretest and retest scores were used in the data analysis. The same method was followed regarding the follow-up test. The retest and follow-up scores were then used to be compared in the data analysis.

b. The *Schonell silent-reading test R4 for children up to 14 years* (Schonell & Goodacre, 1974)

The number of correct answers provided by the participants was converted to a silent–reading age by means of norm tables and this silent-reading age (in years and months) was converted to months as with the one-minute reading test. It was also subtracted from each participant's chronological age (in months). The result indicated how far each participant was behind regarding his/her silent-reading comprehension. The retest scores were used in the same way. A *lower* score would therefore indicate an improvement in the participant's silent-reading comprehension. These pretest and retest scores were used in the data analysis. The same method was followed regarding the follow-up test. The retest and follow-up scores were then used to be compared in the data analysis.

c. The standardised *ESSI graded reading and spelling test for grades 1 to 7* (Esterhuyse, 1997)

After the tests had already been conducted it became clear that the data provided by the ESSI reading and spelling tests could not be evaluated as the manual explained it, since the tests are supposed to be

used to ascertain the reading level of the learner at a certain stage and not to compare the levels before and after a certain intervention. The pretests and retests were performed according to the manual and the pretest scores were obtained by comparing each participant's scores in the reading and spelling tests with the norm tables. The norm tables indicated the reading level, for instance grade 4, second term. Since all the participants' reading levels were much lower than their own grade level, each one's level was recorded with the corresponding stanines and percentiles.

Also due to the fact that all the participants tested far below their own grade-level, they were once again given the screening test before the retest to ascertain whether there had been an improvement or not. In cases where the participants' scores were poorer in this second screening test, they were given the chance to do the same test as during the pretest. There were, however, cases in which the participants could not even manage two out of the five words in the screening tests they had managed before and this is why the resulting scores are indicated as negative. This way of evaluation was performed consistently regarding participants in both groups to ensure uniformity.

In order to obtain specific raw scores for the retest the stanines and percentiles of participants were taken into account to ascertain whether there had been an improvement or not in cases where the retest was on the same level as the pretest. Since not one of the participants had tested at his/her own grade-level during the pretest, this was the only way of determining whether there had been an improvement or not. The time lapse between the pretests and retests was not taken into account since it would make no difference when calculating the results. All the participants were so far beneath their own grade level that one extra term was of no importance and only the improvement or not mattered.

If there was an improvement and it extended over more than one grade, all the possible stanines and percentiles were compared. If a learner, for instance, had 13 out of 20 spelling words correct on grade 2 level in the pretest and then 13 out of 20 words correct on grade 3 level in the retest while he/she was in grade 4, the following procedure was followed:

i. First the stanines, percentiles and reading levels were determined:

<u>PRETEST: Grade 2 spelling test 13/20 obtained:</u>

stanine 5 and percentile 60 on fourth-term level in grade 2

stanine 6 and percentile 77 on third-term level in grade 2

stanine 7 and percentile 89 on first- and second-term level in grade 2

<u>RETEST: Grade 3 spelling test 13/20 obtained:</u>

stanine 5 and percentile 60 on third- and fourth-term level in grade 3

stanine 6 and percentile 7 on second-term level in grade 3

stanine 7 and percentile 89 on first-term level in grade 3

ii The *highest* stanine and percentile that *coincided* were then compared. Here it would be stanine 7 and percentile 89. This was compared and the difference in terms calculated. Here it would

mean grade 3, term 1 minus grade 2 term 2 and this implies an improvement of 3 terms. This was then used as the raw score.

iii. If a raw score could not be calculated in this way because there were no coinciding stanines and percentiles, the lowest term in the highest grade was taken and the highest term of the lowest grade was subtracted from it.

iv. This procedure was strictly adhered to regarding all participants.

v. If the posttest score was *higher* than the pretest score, it indicated an improvement in a participant's reading or spelling ability.

vi. The same procedure was followed regarding the follow-up tests. However, the participants were not given a screening test this time. Only if the participant had scored 20 in the spelling or reading retest, a screening test was given during the follow-up testing session.

v. The oral tests were audiotaped and evaluated by an independent research assistant to exclude bias.

d. The *ASEBA school-age forms & profiles* (Achenbach & Rescorla, 2001)

The parent format, namely the *Child Behavior Checklist for Ages 6-18* (CBCL/6-18), as well as the educator format, namely the *Teacher's Report Form for Ages 6-18* (TRF/6-18), each consists of 113 questions that have to be answered on a scale of 0 to 2. Each questionnaire's answers were processed by means of the computer program, Assessment Data Manager Version 5,0 (Achenbach & Rescorla, 1999-2004), which provided raw scores, t-scores and percentiles according to 17 subsections, for instance social problems, aggression, internalising problems and behavioural/conduct problems. The pretest and retest t-scores of each subsection were used in the data analysis.

If the t-scores were *lower* in any subsection of the retest it indicated that the participant's psychological functioning had improved regarding that specific subsection.

The same method was used for the follow-up test, but the TRF/6-18 was not used again.

As far as statistical techniques are concerned, descriptive statistics (averages, histograms and the Shapiro-Wilk Test for samples < 50) were used to determine whether the distribution was normal since the sample was so small, and these statistics confirmed that it was not. Therefore non-parametric tests were used to analyse the data, namely the Mann-Whitney U Test for two non-related groups (N = 20) and the Wilcoxon Signed-Rank Test for related groups (n = 10 each).

All the data were processed by the Centre for Statistical Consultation (Stellenbosch University) and a senior research assistant of the Department of Psychology (Stellenbosch University).

CHAPTER 3

RESULTS

3.1 A personality profile of the child with a reading disorder

The following results were obtained regarding the characteristics and functioning of the child with a reading disorder from the demographic questionnaires completed by the parents and the educators of the experimental group and the control group (Appendices 1 and 2), the CBCL/6-18 and the TRF/6-18, as well as the structured interviews held with the participants of the experimental group by means of the questionnaire for learners (Appendix 3).

3.1.1 Developmental history

Taking into consideration the section about the causes of reading problems (1.4.1) certain observations were made regarding the participants' developmental history.

According to the parents 14 of the 20 participants were born after a full-term pregnancy. Seven of these 14 children were born by means of a Caesarean section and 3 by means of suction or forceps. Four of these births were without any further intervention or complications. Of the 6 premature births 5 had also taken place by means of a Caesarean section. The reasons given for these premature births, were as follows: 1 Caesarean section due to fetal distress at 35 weeks, 1 incidence of natural birth due to spontaneous labour at 36 weeks, 1 emergency Caesarean section after spontaneous labour at 36 weeks with baby in breech position, and 3 emergency Caesarean sections at 38 weeks due to placental problems. There was 1 report of prenatal complications due to placental problems, which most probably gave rise to the premature birth of the child.

According to the parents 18 or the 20 participants had suffered from common children's ailments and diseases and 2 had had none. Chronic diseases refer to general ailments such as ear infections (otitis), tonsillitis, and allergies. There were 11 participants who had had some form of chronic problem. One participant had had meningitis when he was 8 months old as a result of measles..

As far as developmental milestones are concerned, participants who had not reached the normal milestones were in the minority. According to parents only 2 participants had not crawled at all, and 4 could either walk before they started crawling, only crawled for a few days and then started walking or had to be forced to crawl. This means that in the total group there were 6 participants who had either skipped the crawling stage or at least had not experience it in a normal way. As far as language development is concerned 6 participants' parents indicated that their child started talking at a late stage or used baby talk for a long period of time.

In the research group there were 2 participants who had a minor hearing deficit and 8 who had to wear glasses, mainly for reading. A further 11 participants' parents indicated that these children had a history of problems concerning hyperactivity, attention and/or concentration.

The distribution of these problems and complications is given in Table 2.

Tabel 2

Frequency Distribution of Problems during Participants' Developmental History (N = 20)

Problems		Experimental group	Control group	Total
Prenatal problems	Placenta insufficiency	1	0	1
Pregnancy:				
Full-term	Caesarean section	2	5	7
	Suction/Forceps	0	3	3
Premature birth	35 weeks, fetal distress, eCs*	1	0	1
	36 weeks, normal birth	1	0	1
	36 weeks, placenta, eCs*	1	0	1
	38 weeks, placenta, eCs*	3	0	3
Childhood diseases		8	10	18
Chronical/serious diseases:	Chronical otitis (grommets)	1	3	4
	Allergies, such as asthma	2	0	2
	Chronical tonsillitis	3	2	5
	Others (meningitis)	1	0	1
Milestones** not achieved normally:	Sitting (later than 5-7 months)	0	0	0
	Crawling abnormal	2	2	4
	Crawling phase skipped	1	1	2
	Standing (later than 8-12 months)	1	0	1
	Walking (later than 15 months)	1	0	1
	Talking intelligibly (later than 30-36 months)	4	2	6
Hearing problems:	Minor loss of hearing	1	1	2
Eye problems:	Wearing glasses for reading/myopia	5	3	8
Attention/ concentration problems		6	5	11

Note *eCs = emergency Caesarean section
**Milestones according to Louw et al. (1999), pp. 170, 189-191

3.1.2 Family situation

As far as the family situation is concerned, 10 of the participants came from families with both a biological father and mother. There were 7 divorced families and 3 where either the mother of father had passed away. There were only 2 reconstructed families. In the families where there had been a divorce or where one of the parents had passed away, 8 of the participants lived with their mother and 2 with their father. The birth distribution of all the participants was as follows: 7 eldest children, I middle child, 10 youngest children and 2 only children.

According to the parents who completed the questionnaires, there was at least 1 parent, brother or sister in 14 of these families who also had a learning problem. This entailed 21 individuals with a learning problem, which included problems with concentration. In 6 families there was no history of learning disorders. The distribution according to gender includes 11 female and 10 male relatives with a learning problem. Among these 21 relatives a further 5 specifically had concentration problems. The occupations of these parents were also examined and the results showed that 10 of these 13 parents were entrepreneurs. The distribution of information regarding the participants' family situation is given in Table 3.

Table 3

Frequency Distribution of Information regarding Participants' Family Situation (N = 20)

Family situation		Experimental group	Control group	Total
Marital status:	Married	4	6	10
	Divorced and single	2	3	5
	Divorced and remarried	2	0	2
	Widowed mother and single	2	0	2
	Widowed mother and remarried	0	0	0
	Widowed father and single	0	1	1
	Widowed father and remarried	0	0	0
Family set-up:	Two biological parents	4	6	10
	Child living with mother	5	3	8
	Child living with father	1	1	2
Child's position:	Eldest	5	2	7
	Middle	0	1	1
	Youngest	4	6	10
	Only	1	1	2
Siblings:	Sisters	4	6	10
	Brothers	6	5	11
	Half-brothers and half-sisters	7	0	7
	Stepbrothers and stepsisters	1	0	1
Siblings with learning problems:	Sisters	1	3	4
	Brothers	2	2	4
Parents with learning problems:	Mother	3	4	7
	Father	4	2	6
Siblings'/parents' type of problem:	Learning problems	7	9	16
	Concentration problems	3	2	

3.1.3 History of participants' learning problems

According to the questionnaires 19 participants attended a playgroup, nursery school or preprimary school before going to primary school and only 1 did not. Including this participant, 8 other participants' parents indicated that their child had not been ready for school. Some of the reasons were concentration problems and emotional problems such as anxiety. These participants' preprimary educators had mainly determined this. Three of these participants had to repeat grade 1, 1 had to repeat grade 2, and I grade 6. Another participant whose parents did not indicate that he had not been ready for school, had to repeat grade 6. This means there had already been indications that 45% of these participants might have had problems before they entered primary school, and 6 of these children's parents indicated that they realised their child had a problem before they entered primary school. Seven other parents said that they noticed their child's reading problem in grade 1. It was also noted by the children's educators. Another 2 participants' problem was noticed in grade 2, 1 in grade 3, a further 3 in grade 4 and 1 in grade 5. The distribution of this history of learning problems appears in Table 4.

Table 4

Frequency Distribution of Participants' History of Learning Problems according to their Parents (N = 20)

		Experimental group	Control group	Total
Play group, nursery school and/or preprimary school attended		9	10	19
Not ready for school as indicated by educators		8	1	9
Problems noticed:				
	Preprimary level	2	4	6
	Grade 1	6	1	7
	Grade 2	2	0	2
	Grade 3	0	1	1
	Grade 4	0	3	3
	Grade 5	0	1	1

There are various kinds of mistakes that learners with a reading disorder can make (Sadock & Sadock, 2003), for instance the omission of letters, addition of letters and the distortion of words. They struggle with distinguishing certain written letters, numerals and symbols. Their reading is laborious and with little comprehension. They often avoid reading activities. In Table 5 a list of problems is given with an indication of how many participants made such mistakes according to the parents, educators and the participants themselves.

Table 5

Frequency Distribution of Typical Problems Manifested at School (N = 20)

Typical problems	Experimental group	Control group	Total
Word reversal, for instance *dam* for *mad*	8	5	13
Letter transposition, for instance *trun* for *turn*	8	6	14
Reversal of letter forms, for instance *b/d*, *p/g*	9	3	12
Spelling problems, especially phonetical	10	10	20
Handwriting problems, especially untidy and illegible	7	8	15
Omission, for instance capital letters and punctuation marks	10	8	18
Written sentences immature	8	6	14
Grammar mistakes, for instance incorrect plurals and diminutives	8	9	17
Poor written vocabulary	10	10	20
Loses place when reading	9	8	17
Problems with reading out loud, for instance laborious and full of mistakes	10	8	18
Poor comprehension when reading out loud	8	7	15
Poor comprehension when reading silently	8	6	14
Poor comprehension when being read to or when listening	0	2	2
Avoids reading	9	7	16
Poor spoken vocabulary according to parents and educators	0	0	0
Pronunciation mistakes	10	8	18
Problems concentrating on schoolwork according to educator: often	7	8	14
Problems concentrating on schoolwork according to educator: sometimes	1	1	2
Daydreaming: mild	9	4	13
Problems with direction: often	2	3	5
Problems with direction: sometimes	2	0	2
Problems balancing: mild	3	3	6

3.1.4 Cognitive psychometric results

A summary of the participants' intelligence-test scores, namely, the Senior South African Individual Scales Revised (SSAIS-R) and the Junior South African Individual Scales (JSAIS), are given in Tables 6 and 7.

Seventeen participants had SSAIS-R-scores and 3 JSAIS-scores. Where certain subscores were unavailable an "x" was indicated. Each participant was awarded a number when the participants were selected and these numbers were used here.

Table 6

Summary of Participants' SSAIS-R-scores (n = 17)

SSAIS-R	Verbal Subtests					Non-verbal Subtests				Extras		Totals of Scores		
P	1	2	3	4	5	6	7	8	9	10	11	VIQ	NVIQ	GIQ
1	7	11	11	13	9	11	10	6	16	7	x	103	105	104
2	7	9	8	9	5	19	12	10	15	10	11	85	126	104
3	8	8	8	9	11	10	13	15	15	x	x	93	121	107
4	x	x	x	x	x	x	x	x	x	x	x	87	110	99
5	7	11	9	6	9	14	10	12	6	6	10	95	109	100
6	9	11	9	9	14	10	10	10	11	8	x	103	102	103
7	8	13	7	11	8	10	14	10	16	9	12	97	116	107
8	7	14	9	8	7	12	15	10	12	8	8	95	115	104
10	10	7	8	7	8	14	11	11	14	x	x	87	101	101
11	x	x	x	x	x	x	x	x	x	x	x	96	111	103
12	6	9	9	8	9	10	18	8	11	8	x	89	115	99
13	8	12	9	10	15	9	12	6	9	11	3	107	94	101
15	9	15	15	9	10	11	10	8	11	7	x	112	100	107
16	2	8	7	8	6	13	17	20	10	7	10	75	132	102
18	7	9	9	13	9	12	11	15	13	x	x	97	118	107
19	10	9	10	12	9	5	13	16	7	x	x	101	102	102
20	x	x	x	x	x	x	x	x	x	x	x	85	100	103
$\bar{x}$	8,9	10,4	9,1	9,4	9,2	11,4	12,5	11,2	11,9	8,1	9,0	94,5	110,4	103,1

Note *P*=Participants;1 = Vocabulary; 2 = Comprehension; 3 = Similarities; 4 = Numerical Problems; 5 = Story Memory; 6 = Completing Patterns; 7 = Block Patterns; 8 = Missing Parts; 9 = Form Board; 10 = Digital Memory; 11 = Encoding; VIQ = Verbal Intelligence Quotient; NVIQ = Non-verbal Intelligence Quotient; GIQ = Global Intelligence Quotient

The results indicate that the participants' scores regarding numerical memory, encoding ability and verbal ability (except vocabulary) were below the averages of 10 and 100. Their non-verbal scores were, however, on an average all above 11 and 110.

Table 7

Summary of Participants' JSAIS-scores (n = 3)

P	1	2	3	4	5	6	7	8	9	10	11	12	13	VIQ	NVIQ	GIQ
9	14	10	8	8	x	11	13	9	12	9	9	8	10	104	110	102
14	x	x	x	x	x	x	x	x	X	x	x	x	x	109	113	108
17	x	x	x	x	x	x	x	x	X	x	x	x	x	75	132	102
$\bar{x}$	14	10	8	8	x	11	13	9	12	9	9	8	10	96,0	118,3	104,0

Note P = Participants; 1 = Form Board; 2 = Vocabulary; 3 = Ready Knowledge; 4 = Numeric and Quantitative Comprehension; 5 = Digital Memory; 6 = Block Patterns; 7 = Picture Puzzles; 8 = Word Association; 9 = Absurdities A; 10 = Absurdities B; 11 = Form Discrimination; 12 = Numeric; 13 = Memory; VIQ = Verbal Intelligence Quotient; NVIQ = Non-verbal Intelligence Quotient; GVT = Global Intelligence Quotient

Since only one participant's subtest-scores were available, the averages were not really representative, except the VIQ-, NVIQ- and GIQ-scores and these once more indicated verbal scores less than the average of 100 and non-verbal scores substantially above the average, namely 118,4. The average of the global intelligence quotients was also above the average of 100.

Certain participants had also undergone other tests, such as the Gardner Test for Non-Motor Visual-Perceptual Skills (Gardner Test), the Hammill Developmental Test of Visual Perception 2 (Hammill Test) and the Beery-Buktenika Developmental Test of Visual-Motor Integration (Beery Test) used by many therapists. A few participants had also undergone some other tests, such as the Bender Visual-Motor Gestalt Test and the Goodenough-Harris-Draw-A–Person Test, but the results had not been reported well enough to be used.

A summary of the available Gardner-Test scores is provided in Table 8 because the scores were quite complete. A score of 10 and a global score of 100 indicate that the participant scored according to his/her age expectation.

Table 8

Summary of Participants' Gardner-Test scores (n = 7)

P	1	2	3	4	5	6	7	8
1	19	13	10	11	12	9	8	112
8	15	13	12	11	12	11	11	x
9	19	17	14	4	14	16	19	134
11	15	16	14	11	16	12	4	118
12	4	10	11	11	13	9	13	101
16	16	12	14	11	10	9	14	117
17	6	2	11	9	5	6	9	x
$\bar{x}$	13,4	11,9	12,3	9,7	11,7	10,3	11,1	116,4

Note P = Participants; 1 = Visual Discrimination; 2 = Visual Memory; 3 = Visio-Spatial Relations; 4 = Visual Form-Constancy; 5 = Visual-Sequential Memory; 6 = Visual Foreground-Background; 7 = Visual Closure; 8 = Perceptual Quotient

In all the subtests, except visio-spatial relations, individual participants did not perform according to the age expectation of 10 and the average for visual form-constancy was also less than 10. Yet the five perceptual-quotient scores that were available indicate that the participants had performed above average, even above the age-expectation average.

Although only 3 learners had undergone the Hammill Test, these scores were also provided because the same participants who underwent the Gardner Test were involved and this means that they could be compared. The summary is given in Table 9. A score of 10 and an average of 100 indicate that the participant performed according to age expectation.

Table 9

Summary of Participants Hammill-Test Scores (n = 3)

P	1	2	3	4	5	6	7	8	9	10	11
8	7	11	11	8	14	14	8	13	105	103	105
9	14	6	10	15	9	12	10	9	104	110	100
11	14	15	10	16	16	6	9	10	114	112	115
$\bar{x}$	11,7	10,7	10,3	13,0	13,0	10,7	9,0	10,7	107,7	108,3	106,7

Note P = Participants; 1 = Eye-Hand Co-ordination; 2 = Position in Space; 3 = Tracing; 4 = Foreground-Background; 5 = Spatial Relations; 6 = Visual Closure; 7 = Visual-Motor Speed; 8 = Form Constancy; 9 = General Perception Quotient; 10 = Visual-Perception Quotient; 11 = Visual-Motor-Integration Quotient

According to Table 9 individual participants did not perform according to age expectancy (in all the subtests except tracing). In the visual-motor-speed subtest the average performance was less than 10. However, all the participants had global scores above age expectancy regarding the general perception quotient and the visual-motor-integration quotient. The three participants under discussion also performed above the age expectancy regarding the Gardner Test's perceptual quotient

As far as the Beery Test is concerned, only the global visual-motor-integration scores were available and are provided in Table 10. The same 7 participants of the previous two tests were once again involved and this provided an opportunity for comparison. A score of 100 indicates a performance according to age expectancy.

Table 10

Summary of Participants' Beery-Test Scores (n=7)

Participants	Visual-Motor-Integration Quotient
1	131
8	115
9	99
11	99
12	118
16	123
17	96
$\bar{x}$	111,6

Two of the participants (who were involved in the previous two tests) performed below the age expectancy (99) and one who had not undergone the other tests, scored 96. This is below average. The total average, however, is substantially more than the age expectancy of 100, namely 111,6.

3.1.5 History of participants' social development

As far as the participants' social performance is concerned, their family, school and other relationships were scrutinised. Not one parent or child indicated that their family relationships were problematic. The usual difficulties that parents, children and siblings have with one another were reported, but they were not markedly different from those that present themselves in families where there are not children with learning disorders. According to the educators most of the parents were supportive of and interested in their child and they reacted to school correspondence.

As far as relationships involving school and other social areas are concerned, the indication was that 10 of the participants found it easy to make friends, but the other 10, in turn, found it difficult and only had one or two friends.

The conduct of the participants at school, such as their attitude towards the school, their educators and other learners, was indicated as being acceptable to good. There was one participant who did become aggressive towards other children under certain circumstances. He and his parents were aware of his tendency to be short-tempered. The educators and parents of another participant indicated that his

classmates teased him, but according to them this had nothing to do with his reading problem. The educators also indicated that some of the older boys sometimes were difficult in class.

3.1.6 History of participant's emotional problems and schoolwork motivation

The prevalence of emotional problems was determined in two ways, namely by means of answers to questions asked during the interviews with the participants, as well as the CBCL/6-18 that the parents had to complete. No direct questions were asked in the demographic questionnaire about the participants' emotional problems or the effect it had on their self-image, but going by the answers to the question asked about the effect of the reading disorder on these participants, the deduction could be made that all of them had suffered some kind of emotional problem due to it. According to the answers it seemed as though at least 6 of the participants of the experimental group still experienced problems. Two said that they had fewer emotional problems since attending the specific school they were in, and the other 2 said that they no longer had any emotional problems. The parents of I of the participants of the control group indicated that she still had many emotional problems, 8 said that there had been an improvement due to the fact that they were in their present school and 1 parent said that the participant's emotional problems had disappeared completely.

It also became apparent from the questionnaires and interviews that the participants' reading problems had a very important influence on their motivation regarding their schoolwork, especially while they still attended mainstream schools. In the experimental group there were 9 and in the control group 5 who reported this tendency. Another 6 indicated that it had no influence on their motivation, but this only included 1 participant from the experimental group. In Table 11 the distribution is given of emotional problems and schoolwork motivation according to the history provide by the parents and the participants in the experimental group.

Table 11

Frequency Distribution of Participants' History of Emotional Problems and Schoolwork Motivation (N = 20)

	Experimental group	Control group	Total
Emotional problems experienced previously	10	10	20
Emotional problems experienced at present	6	1	7
Fewer emotional problems at present	2	8	10
No emotional problems at present	2	1	3
Schoolwork motivation low	9	5	14
Schoolwork motivation good	1	5	6

In Table 12 the different kinds of emotional problems that were reported and their distribution are given. The two emotions that had the highest report rate, was anxiousness and feelings of inferiority. It has to be kept in mind that the parents and participants were not provided with a list of various emotions from which they had to choose. They personally indicated these emotions. It also has to be kept in mind that interviews were only held with participants of the experimental group and not with the others. This might have had an effect on the profile.

Table 12

Frequency Distribution of Participants' Different Emotional Experiences (N = 20)

	Experimental group	Control group	Total
Aggression	1	1	1
Anxiousness	2	2	4
Depression and withdrawal	4	0	4
Frustration	1	1	2
Inferiority	5	4	9
Little self-confidence	0	1	1
Despondency	2	0	0
Negativity	3	0	3
Self-consciousness	1	1	2
Anger	2	0	2

3.1.7 Strong characteristics, interests and ideals

The continuity of certain themes was salient. There were 13 participants who were interested in sport and 8 of them did extremely well. Furthermore, 7 were skilled in the use of or showed an interest in computers, 6 in mechanical and technical matters, 11 in art, 11 in animals and nature and 4 in entrepreneurial enterprises. These interests were also reflected in their ideals for the future. As far as the experimental group is concerned 5 indicated that they would like to work with animals, (nature conservator, veterinary surgeon). 3 wanted to become entrepreneurs, 1 an engineer and 1 a pilot.

A distribution of these characteristics and interests are given in Table 13.

Table 13

Frequency Distribution of Participants' Strong Characteristics and Interests (N = 20)

	Experimental group	Control group	Total
Interested in sport	8	5	13
Excelling in sport	6	2	8
Interested in computers	4	3	7
Interested in mechanical objects, such as machinery	3	3	6
Artistic, creative abilities	6	5	11
Interested in nature and animals	6	5	11
Interested in entrepreneurial matters	2	2	4

3.1.8 Psychological functioning according to the CBCL/6-18 and the TRF/6-18

An analysis was made of the CBCL/6-18 and TRF/6-18 that parents and educators had to complete before the intervention. This was done to ascertain whether there were corresponding behavioural problems among the participants. This included problems that were, for instance, grouped together as anxiousness/depression, withdrawal/depression, somatic complaints, social complaints, thought problems, attention problems, rule-breaking behaviour and aggressive behaviour. The analysis also indicates to what extent the participants' were internalising and/or externalising their problems. There was quite a number whose behaviour was indicated as being on a clinical level or at least on the border between normal and pathological behaviour. The parents' questionnaires indicated that 5 participants' conduct problems were clinically diagnosable and 4 of them were borderline cases. The educators' questionnaires indicated that 2 participants were on a level of being clinically diagnosable, with 4 as borderline cases. Three of these 15 participants overlapped. This means that there were 12 participants whose CBCL/6-18 and TRF/6-18 scores did not fall within a normal conduct framework.

A frequency distribution of the conduct problems that appeared among 50% or more of the participants is given in Table 14 (CBCL/6-18) and Table 15 (TRF/6-18). The emotional aspects mentioned in Table 14 can be compared to the results in Table 12.

Table 14

Frequency Distribution of Participants' Behavioural Problems according to the CBCL/6-18 (N = 20)

CBCL/6-18 subtests		Experimental group	Control group	Total
ANXIOUSNESS/DEPRESSED	Perfectionism	5	5	10
	Feels unloved	7	4	11
	Feels worthless	5	8	13
	Nervous	7	5	12
	Self-conscious	7	7	14
	Feels worried	7	5	12
WITHDRAWN/DEPRESSED	Won't talk	5	6	11
	Secretive	6	6	12
	Sad	4	6	10
SOMATIC COMPLAINTS	Headaches	9	5	14
	Sleepwalking	7	4	11
SOCIAL PROBLEMS	Lonely	6	6	12
	Jealous	6	6	12
	Teased	4	6	10
ATTENTION PROBLEMS	Fails to finish tasks	8	10	18
	Concentration problems	6	9	15
	Cannot sit still	8	5	13
	Daydreams	6	5	11
	Impulsive	8	8	16
	Poor schoolwork	4	6	10
	Inattentive	7	7	14
RULE-BREAKING PROBLEMS	Breaks rules	5	8	13
	Tells lies/cheats	4	7	11
	Prefers older friends	7	4	11
AGGRESSIVE BEHAVIOUR	Argues	10	10	20
	Demands attention	8	9	17
	Disciplinary problems at home	5	8	13
	Stubborn	8	9	17
	Moody	7	6	13
	Sulks	5	7	12
	Teases others	7	7	14
	Temper tantrums	7	7	14
INTERNALISING PROBLEMS		10	8	18
EXTERNALISING PROBLEMS		7	9	16
TOTAL OF PROBLEMS: BORDERLINE LEVEL		0	4	4
TOTAL OF PROBLEMS: CLINICAL LEVEL		3	2	5

Tabel 15

Frequency distribution of Participants' Behavioural Problems according to the TRF/6-18 (N = 20)

TRF/6-18 Subtests		Experimental group	Control group	Total
ATTENTION PROBLEMS	Acts younger than peers	4	6	10
	Noisy	6	4	10
	Fails to finish tasks	6	5	11
	Concentration problems	8	7	15
	Cannot sit still	7	6	13
	Fidgets	8	7	15
	Daydreams	7	6	13
	Impulsive	7	5	12
	Learning problems	7	6	13
	Talks out of turn	6	5	11
	Inattentive	6	5	11
	Talks too much	8	7	15
AGGRESSIVE BEHAVIOUR	Argues	5	8	13
INTERNALISING PROBLEMS		7	6	13
EXTERNALISING PROBLEMS		6	9	15
TOTAL OF PROBLEMS: BORDERLINE LEVEL		3	1	4
TOTAL OF PROBLEMS:OP CLINICAL LEVEL		1	1	2

To summarise the participants' emotional experiences by means of the information obtained from the CBCL/6-18 and the TRF/6-18 (Tables 14 and 15) as well as the demographic questionnaires (Table 12) it can be said that these participants suffered mainly from anxiousness and depressive feelings (inferiority, worthlessness, little self-confidence, self-consciousness and negativity). Regarding the behavioural/conduct problems, it seems as though there were many problems with aggression, (temper tantrums), rule-breaking behaviour and attention (especially impulsiveness and attention deficit).

3.2 Results of reading and spelling tests

As mentioned previously, descriptive statistics (such as averages, histograms and the Shapiro-Wilk Test for samples < 50) were used to determine whether the distribution was normal or not due to the small sample size. The Shapiro-Wilk Test confirmed that it was not normal and the results of this test are given in Table 16.

Table 16

Shapiro-Wilk Statistics that point to Non-normal Distribution of Data (N = 20)

Tests	p
Schonell silent-reading test	,02
Schonell one-minute reading test	,77
ESSI spelling test	,00
ESSI reading test	,00
CBCL/6-18:	
1. Anxious/depressed	,09
2. Withdrawn/depressed	,02
3. Somatic complaints	,15
4. Social problems	,03
5. Thought problems	,01
6. Attention problems	,11
7. Rule-breaking behaviour	,01
8. Aggressive behaviour	,05
9. Internalising problems	,03
10. Externalising problems	,66
11. Problems: total	,60
12. Affective problems	,10
13. Anxiety problems	,02
14. Somatic problems	,04
15. ADHD*-problems	,68
16. OD**-problems	,02
17. Conduct problems	,34

Note *ADHD= Attention Deficit/Hyperactivity; **OD = Oppositional Defiant
p < ,05, two-way value

Eleven of the 21 tests had a non-normal distribution (p < ,05) and therefore non-parametrical tests were used, namely the Mann-Whitney U Test for two non-related groups (N = 20) and the Wilcoxon Signed-Rank Test for related groups (n = 10 each).

To ascertain whether the experimental group and the control group could be compared as far as their reading and spelling levels were concerned, the significance of any differences was ascertained by means of the Mann-Whitney U Test. The results are given in Table 17.

Table 17

Comparison between the Mann-Whitney U Values of the Experimental Group and the Control Group regarding Results of the Four Reading and Spelling Pretests (N = 20)

Tests	Experimental group $\bar{x}$	Control group $\bar{x}$	Mann-Whitney U	p
Schonell silent-reading test	56,30	48,20	36,00	,29
Schonell one-minute reading test	58,50	42,40	29,00	,11
ESSI spelling test	6,50	6,20	50,00	,00
ESSI reading test	7,50	8,20	39,00	,40

p < ,05, two-way value

The results showed that there were no significant differences between the participants as far as any of the reading or spelling tests was concerned. All the p-values were bigger than ,05, namely p = ,29; p = ,11; p = 1,00 and p = ,40 for the Schonell silent-reading test, the Schonell one-minute reading test, the ESSI spelling test and the ESSI reading test respectively. The groups were therefore comparable.

After the Davis intervention had been done with the experimental group, the Wilcoxon Signed-Rank Test was performed on the results of both groups to ascertain whether the intervention had brought about any significant changes. The results are given in table 18

Table 18

Comparison between the Wilcoxon Signed-Rank Values of the Experimental Group and the Control Group regarding the Four Reading and Spelling Pretests and Retests (N = 20)

Tests	Pretest $\bar{x}$	Retest $\bar{x}$	Z	p
EXPERIMENTAL GROUP (n = 10)				
Schonell silent-reading test	56,30	47,10	-2,81	,00
Schonell one-minute reading test	58,50	56,50	-0,89	,19
ESSI spelling test	6,50	11,50	-2,54	,01
ESSI reading test	7,50	9,80	-2,54	,01
CONTROL GROUP (n = 10)				
Schonell silent-reading test	48,20	45,70	-1,23	,11
Schonell one-minute reading test	42,40	45,80	-2,09	,02
ESSI spelling test	6,20	6,30	-0,27	,40
ESSI reading test	8,20	8,10	-0,68	,25

p < ,05, one-way value

The hypothesis was that the Davis programme would improve the reading ability of children with a reading disorder in a short period of time. Since an improvement had been predicted, the one-way values were taken into account and according to this, there had been a significant improvement regarding the experimental group's Schonell silent-reading test (p = ,00), the ESSI spelling test (p = ,01) and the ESSI reading test (p = ,01) but not as far as the Schonell one-minute reading test (p = ,19) was concerned, although there had been a slight improvement in the latter's raw scores since the average deficit had been reduced from 58,50 months to 56,50 months (Table 18).

The control group showed no significant improvement in any of the three tests in which the experimental test had significantly improved, namely the Schonell silent-reading test (p = ,11), the ESSI spelling test (p = ,40) and the ESSI reading test (p = ,25), and there had been a significantly negative change regarding the raw scores of the Schonell one-minute reading test (p = ,02). The average deficit of 42,40 months had become even bigger, namely 45,50 months (Table 18).

Due to the fact that the experimental group showed a significant improvement regarding three of the four reading and spelling tests as well as an improvement regarding the fourth test (taking the raw scores into account), all the participants of the experimental group were once again tested 12 weeks after the intervention had been completed. All four the reading and spelling tests were again given to determine whether the improvement had been maintained. The data was again analysed by means of the Wilcoxon Signed-Rank Test and the results are given in Table 19.

Table 19

Comparison between the Wilcoxon Signed-Rank Values of the Experimental Group's Reading and Spelling Retests and Reading and Spelling Follow-up Tests (n = 10)

Tests	Retest $\bar{x}$	Follow-up test $\bar{x}$	Z	p
Schonell silent-reading test	47,10	52,50	-1,19	,12
Schonell one-minute reading test	56,50	53,60	-0,62	,27
ESSI spelling test	11,50	11,70	-1,14	,08
ESSI reading test	9,80	10,30	-1,19	,12

p < ,05, one-way value

There were no significant differences between any of the reading or spelling tests' retests and follow-up tests (p > ,05), and this signifies that the improvement had been maintained.

According to 7 of the participants they had not continued with the programme (Appendix 5). One tried to keep it up 3 times a week; another said he did it once a week and a third said he tried to do it every now and again.

3.3 Results of the CBCL/6-18 and the TRF/6-18

As mentioned previously non-parametric tests were used to analyse the data, namely, the Mann-Whitney U Test for two non-related groups and the Wilcoxon Signed-Rank Test for related groups.

3.3.1 Results of the CBCL/6-18

Al the data obtained were processed by means of the computer program, Assessment Data Manager Version 5,0 (Achenbach & Rescorla, 1999-2004), and the t-test scores were used as raw scores. The Mann-Whitney U Test was used to ascertain whether the results obtained regarding the two groups of participants before the intervention were comparable due to the fact that they did not differ significantly. The results are given in Table 20.

Table 20

Comparison between the Mann-Whitney Values of the Experimental Group and the Control Group regarding the Pretest of the CBCL/6-18 (N = 20)

Subtests	Experimental group $\bar{x}$	Control group $\bar{x}$	Mann-Whitney U	p
1. Anxious/Depressed	61,30	57,50	37,50	,34
2. Withdrawn/depressed	56,60	57,40	47,00	,82
3. Somatic complaints	63,90	56,40	24,50	,05
4. Social problems	59,80	58,80	46,50	,79
5. Thought problems	57,20	57,60	49,50	,97
6. Attention problems	58,10	59,70	39,50	,43
7. Rule-breaking behaviour	53,90	55,90	47,50	,85
8. Aggressive behaviour	60,10	59,80	48,00	,88
9. Internalising problems	61,60	55,20	32,50	,18
10. Externalising problems	57,20	58,40	43,50	,62
11. Problems: Total	58,70	58,20	49,00	,94
12. Affective problems	59,70	59,40	48,00	,88
13. Anxiety problems	59,50	54,80	30,50	,14
14. Somatic problems	60,80	56,10	30,50	,14
15. ADHD*-problems	58,50	61,20	35,00	,26
16. OD**-problems	57,90	59,40	41,50	,52
17. Conduct problems	55,20	55,80	47,50	,85

Note *ADHD = Attention Deficit/Hyperactivity; **OD = Oppositional Defiant
$p < ,05$, two-way value

The results indicated that, except somatic complaints (p-value = ,05), there was no significant difference between the participants regarding any of the other 17 subtests ($p > ,05$). Therefore the two groups were comparable. .

After the experimental group had received the Davis intervention, the Wilcoxon Signed-Rank Test was performed on both groups' pretest and retest results regarding their psychological functioning. The results are given in Table 21.

Table 21

Comparison between the Results of the Experimental Group and the Control Group regarding the CBCL/6-18 Pretest and Retest according to the Wilcoxon Signed-Rank Values (N = 20)

Subtests	Pretest $\bar{x}$	Retest $\bar{x}$	Z	p
EXPERIMENTAL GROUP (n = 10)				
1. Anxious/depressed	61,30	55,90	-2,52	,01
2. Withdrawn/depressed	56,60	54,10	-1,05	,15
3. Somatic complaints	63,90	57,60	-1,95	,03
4. Social problems	59,80	57,00	-1,54	,06
5. Thought problems	57,20	53,60	-2,53	,01
6. Attention problems	58,10	56,90	-0,85	,20
7. Rule-breaking behaviour	53,90	52,70	-1,95	,03
8. Aggressive behaviour	60,10	55,80	-2,04	,02
9. Internalising problems	61,60	52,50	-2,69	,00
10. Externalising problems	57,20	50,90	-2,20	,01
11. Problems: Total	58,70	51,90	-2,67	,00
12. Affective problems	59,70	55,40	-2,21	,01
13. Anxiety problems	59,50	53,80	-2,32	,01
14. Somatic problems	60,80	56,70	-1,33	,09
15. ADHD* problems	58,50	56,40	-0,68	,25
16. OD** problems	57,90	54,20	-2,32	,01
17. Conduct problems	55,20	53,00	-1,83	,03
CONTROL GROUP (n = 10)				
1. Anxious/depressed	57,50	54,60	-2,03	,02
2. Withdrawn/depressed	57,40	57,20	-0,25	,40
3. Somatic complaints	56,40	54,40	-1,02	,16
4. Social problems	58,80	56,80	-1,36	,09
5. Thought problems	57,60	56,20	-0,68	,25
6. Attention problems	59,70	57,20	-2,05	,02
7. Rule-breaking behaviour	55,90	55,20	-0,24	,41
8. Aggressive behaviour	59,80	59,10	-0,49	,31
9. Internalising problems	55,20	53,00	-0,61	,27
10. Externalising problems	58,40	56,80	-0,77	,22
11. Problems: Total	58,20	56,10	-1,25	,11
12. Affective problems	59,40	56,30	-0,95	,17
13. Anxiety problems	54,80	54,40	-0,68	,25
14. Somatic problems	56,10	53,50	-1,26	,10
15. ADHD* problems	61,20	58,80	-2,75	,00
16. OD** problems	59,40	57,80	-0,89	,19
17. Conduct problems	55,80	56,50	-0,49	,31

Note *ADHD = Attention Deficit/Hyperactivity; **OD = Oppositional Defiant

$p < ,05$, one-way value

The hypothesis was that Davis methods would contribute positively to the psychological functioning of individuals with a reading disorder. Due to the fact that an improvement had been predicted, the one-

way values were taken into account and according to the Wilcoxon Signed-Rank Values the experimental group showed a significant improvement in the following 12 of the 17 subtests (Table 21): anxious/depressed (p = ,01), somatic complaints (p = ,03), thought problems (p = ,01) rule-breaking behaviour (p = ,03), aggressive behaviour (p = ,02), internalising problems (p = ,00), externalising problems (p = ,01), problems: total (p = ,00), affective problems (p = ,01), anxiety problems (p = ,01), oppositional defiant problems (p = ,01) and conduct problems (p = ,03). They did not show any significant improvement (p > ,05) regarding the following subtests: withdrawn/depressed (p = ,15), social problems (p = ,06), attention problems (p = ,20), somatic problems (p = ,09) and attention deficit/hyperactivity problems (p = ,25). If the averages of the t-scores are however taken into account it is clear that there was at least a decrease in each of these scores. This means that the participants improved, although not significantly, as far as these subtest are concerned

The control group improved significantly in the following 3 of the subtests: anxious/depressed (p = ,02), attention problems (p = ,02) attention deficit/hyperactivity problems (p = ,00). This includes two of the subtests in which the experimental group did not show a significant improvement, namely attention problems (p = ,20) and attention deficit/hyperactivity problems (p = ,25).

Due to the fact that the experimental group showed an improvement in 12 of the 17 CBCL/6-18 subtests, the parents of the experimental group were asked to complete the CBCL/6-18 questionnaire again 12 weeks after the intervention programme in order to ascertain whether the improvement had been maintained. The data were once again analysed by means of the Wilcoxon Signed-Rank Test. The results are given in Table 22.

Table 22

Comparison between the Results of the Experimental Group's CBCL/6-18 Retest and Follow-up Test according to the Wilcoxon Signed-Rank Test (n = 10)

Subtests	Retest $\bar{x}$	Follow-up test $\bar{x}$	Z	p
1. Anxious/depressed	55,90	52,10	-1,753	,04
2. Withdrawn/depressed	54,10	52,20	-1,403	,08
3. Somatic complaints	57,60	52,50	-2,023	,02
4. Social problems	57,00	55,50	-0,850	,20
5. Thought problems	53,60	50,80	-1,753	,04
6. Attention problems	56,90	54,00	-1,781	,04
7. Rule-breaking behaviour	52,70	52,00	-0.594	,28
8. Aggressive behaviour	55,80	54,40	-1,084	,14
9. Internalising problems	52,50	47,30	-1,863	,03
10. Externalising problems	50,90	48,50	-1,687	,05
11. Problems: Total	51,90	46,20	-2,405	,01
12. Affective problems	55,40	51,40	-1,778	,04
13. Anxiety problems	53,80	51,60	-1,841	,04
14. Somatic problems	56,70	52,80	-1,841	,04
15. ADHD* problems	56,40	53,70	-1,974	,03
16. OD** problems	54,20	53,90	-0,085	,47
17. Conduct problems	53,00	52,10	-0,932	,20

Note *ADHD = Attention Deficit/Hyperactivity; **OD = Oppositional Defiant; p < ,05, one-way value

All the scores indicated that the improvement of the experimental group's participants in the 12 subtests of the CBCL/6-18 after the intervention had been maintained. (p > ,05) and that in 7 of these 12 subtests there had been another significant improvement, namely: anxious/depressed (p = ,04), somatic complaints (p = ,02), thought problems (p = ,04), internalising problems (p = ,03), problems: total (p = .01), affective problems (p = ,04) and anxiety problems (p = ,04).

Regarding the 5 subtests in which there had been no improvement after the retest, there was an improvement in the following of these tests after the follow-up test: attention problems (p = ,04), somatic problems (p = ,04) and attention deficit/hyperactivity problems (,03). In the other 2, namely withdrawn/depressed and social problems there was no significant improvement but the averages of the t-scores compared to the averages of the pretest and retest did show a slight improvement. These scores respectively were: 56,60 - 54,10 - 52,20 and 59,80 - 57,00 - 55,50.

3.3.2 Results of the TRF/6-18

The results of the educators' questionnaires (TRF/6-18) were compromised due to the fact that the same educators could not be used to complete the pretest and retest. Regarding the pretest two, educators were used – one to complete the questionnaires concerning the grade 5 and grade 6 participants and one concerning the grade 7 participants. Only two participants' pretest and retest questionnaires were completed by the same educators and these results showed a continuous pattern. The other results were, however, considerably divergent and therefore could not be used to analyse. Only the information of the pretest was used for the profiling. The results of the data analysis were thus not used to test the hypothesis.

CHAPTER 4

DISCUSSION

4.1 Personality profile of the child with a reading disorder

4.1.1 Developmental history (See Table 2)

As far as birth complications are concerned Sadock and Sadock (2003) said that pre- and perinatal problems generally appear in the history of children with a reading disorder. In the research group there was 1 recorded incident of prenatal complications due to placenta problems. Furthermore there were 10 recorded incidents of deliveries by means of Caesarean section, suction or forceps (which could include the possibility of complications). Six premature births were reported due to placenta problems, fetal distress and spontaneous premature labour. According to the parents 4 (20%) of these children were born without any problems, which means that pregnancy and/or birth complications do not necessarily have to be regarded as causal. It can, however, not be excluded.

Common children's ailments and diseases can possibly bring about complications. For instance, one of the participants had meningitis at the age of 8 months as a side effect of measles. This lead to the fact that brain fluid had to be drained twice and he remained in a coma for 3 weeks. Although his mother said the electroencephalogram (EEG) that had been taken showed no abnormalities, this disease cannot be excluded as a contributing factor. Two participants' parents indicated that their child had not had any children's diseases.

Although 11 learners had had or still suffered from some chronic medical problem, there were also 9 who never had any sign of such problems. According to Sadock and Sadock (2003) no studies have been done to support the idea that allergies can cause a reading disorder or contribute to it.

A far as developmental milestones are concerned, the number of participants who did not reach them at a normal stage, were in the minority. Davis (1997, 2003) says that many children skip the crawling stage. Shaywitz (2003) also refers to this. Although only 2 parents said that their child had not crawled at all, 4 others reported that their child had walked before he/she could crawl, only crawled a few days or had to be forced to crawl. There were therefore 6 (30%) of these participants who had not undergone the crawling stage in a normal way, which could indicate a causal association.

Regarding language development, 6 parents indicated that their child started talking at a late stage or used baby talk for a long period of time. Davis (1997, 2003) and Shaywitz (2003) both point to the fact that children with a reading disorder often are late in their language development. The fact that the other 14 reached normal language milestones could possibly be an indication of the fact that dyslexia does not necessarily manifest itself in the same way. Shaywitz (2003) calls it the "hidden" disorder. One does not know what to expect of it or how it is going to present itself.

Eye and ear problems are not regarded as causal, but can lead to a diagnosis of a reading disorder if they are not identified beforehand. Sadock and Sadock (2003) say they have to be eliminated before any screening tests for a reading disorder can be performed. In the research group there were 2 participants with minor hearing deficits and 8 had to wear glasses, mainly for reading or due to myopia. According to reports by the parents and educators the other 10 participants did not suffer from either eye or ear problems. These problems had therefore been excluded as possible causes regarding the present study.

According to Sadock and Sadock (2003) children with a reading disorder have an above-average chance of presenting with other conduct disorders, and they particularly mention studies indicating that 25% of such children also have an attention deficit/hyperactivity disorder. This indicates the possibility of a general genetic factor being implicated. In the group of 20 of the present study there were 11 participants who had a history of hyperactivity, attention deficit problems and/or concentration problems. This represents 55% of the group that is much more than the percentage mentioned by Sadock and Sadock (2003). Davis (1997, 2003) supports this point of view and says that many children with dyslexia may have characteristics of hyper- and/or hypo-activity.

4.1.2 Family situation (See Table 3)

Most of the family variables that were studied were distributed evenly and conclusions could not be made as far as its causality regarding reading problems is concerned.

According to the distribution it does seem as though a genetic predisposition toward a reading disorder (such as reading, spelling and concentration problems) played quite a big part. In 14 families there was at least one father/mother/brother/sister with a learning problem. This entailed 21 individuals with a learning problem, including concentration problems. In 6 families there was no history of a learning disorder. It can therefore be said that 70% of these participants had a family history of a learning problems (particularly a reading problem). According to Sadock and Sadock (2003) studies indicated that 35 to 40% of first-degree blood relatives of children with a learning disorder suffer from a similar disorder. In this study a much higher percentage was found.

The distribution according to gender showed interesting results, namely 11 female and 10 male blood relatives, and this is in keeping with the point of view held by many researchers that there are not necessarily more boys than girls with this disorder. Mash and Wolfe (2002) have speculated that there are in fact just as many girls as boys, who have reading problems, but the reasons why more boys than girls are for instance referred for special education, are often distorted. They say that up to 4 times as many boys as girls are referred because they often have more conduct problems. The Connecticut Longitudinal Study (Shaywitz, 2003) also indicated no significant differences between boys and girls and showed that the school-identification procedure had a lot to do with it. Boys are more readily identified than girls. The sampling distribution in the present study itself points in this direction, namely 14 boys and 6 girls, and if the whole research population of 78 boys and 23 girls is taken into account, it becomes even clearer. This amounts to 3,48 more boys than girls and is in keeping with Mash and Wolfe's (2002) speculation.

Of the 21 blood relatives with learning problems, 5 presented with concentration problems, thus 23,80%, and this again is in keeping with Sadock and Sadock (2003) who refers to studies which have indicated that 25% of such children may also have an attention deficit/hyperactivity disorder.

The occupations of the parents who themselves presented with learning problems, were scrutinised. Out of these 13 parents 10 had their own enterprises, which included the creation and selling of paintings, garden services, the production and selling of leather ware and oil products, labour consultation and engineering. This could possibly be in keeping with Davis's (1997, 2003) opinion that someone with a learning disorder does not necessarily think in a step-by-step manner, but sees the bigger picture that is for instance necessary in the business world. Gorman et al. (2003) also found that there was an over-representation of individuals with dyslexia among top artists, scientists and businessmen

4.1.3 History of participants' learning problems (See Tables 4 en 5)

The information gained from the questionnaires indicated that 65% of the children in the present study already presented with problems before grade 2. This is in agreement with what Sadock and Sadock (2003) have to say. Yet, with some children it becomes manifest at a later stage because they often use their memory, association and often an above-average intelligence to hide it. This means that it only becomes obvious in grade 4 and even later, as was the case with some of the participants in the present study.

From Table 5 it becomes clear that these participants had many problems regarding spelling, the use of punctuation and capital letters, grammatical construction, the construction of written sentences, written vocabulary, loud-reading, silent-reading, handwriting and pronunciation. But what also became obvious regarding the different kinds of problems children with a reading disorder have, is the fact that these participants had good comprehension when they did not have to do the reading themselves, were listening to someone else or had to repeat something they for instance saw on television. Their spoken vocabulary was also much better than their written vocabulary. Shaywitz (2003) supports these observations. A further salient point was that the educators, parents and children themselves thought their general knowledge was quite good. It was also observed that some of the participants had a good knowledge of things they were interested in, such as motorcycles, computers, art and sport.

According to parents and educators 16 participants had concentration problems, particularly concerning schoolwork, and 13 had problems daydreaming. This is once again in keeping with Sadock and Sadock's

(2003) reference to studies that indicate a correlation of 25% between a reading disorder and an attention deficit/hyperactivy disorder. Davis (1997, 2003) also refers to the fact that children with dyslexia have problems with daydreaming and concentration.

Furthermore, other tests mentioned previously showed that 7 participants had perceptual-motor problems, and this agrees with Sadock and Sadock's (2003) reference to right-left confusion as one of the possible causes of a reading disorder. Strydom (quoted in Rademeyer, 2004) also mentions this as a contributing factor and Davis (1997, 2003) specifically mentions it as one of the typical characteristics of a child with dyslexia. His programme includes exercises to help overcome right-left confusion.

According to parents and educators there were 6 participants who had mild problems with balancing and this is also one of the characteristics of a child with dyslexia according to Davis (1997,2003).

4.1.4 Cognitive psychometric results (See Tables 6, 7, 8, 9 and 10)

According to the verbal-intelligence scores and the various subscores of the SSAIS-R (Table 6) and the JSAIS (Table 7) all the participants (20) showed deficits in their receptive and expressive language skills. As far as the vocabulary subtest is concerned they obtained an average score, which could be in keeping with the observation that the participants' written vocabulary was poor but not necessarily their spoken vocabulary.

As far as the participants' non-verbal intelligence scores are concerned, only 2 participants showed much lower non-verbal intelligence scores than verbal intelligence scores, and there were 2 participants whose intelligence scores were more or less the same. There were therefore 16 participants whose non-verbal intelligence scores were much higher than their verbal scores. Stowe (2002) warns against the interpretation of intelligence tests because according to her there does not necessarily have to be a big difference between the verbal and non-verbal scores. It is, however, salient that 80% of the participants in the present study had non-verbal intelligence scores that were much higher than their verbal intelligence scores. It leads to the question to what degree Davis's (1997,2003) point of view is in keeping with these data that children with dyslexia are non-verbal thinkers rather than verbal thinkers. No assumptions can however be made on this evidence alone.

In the Gardner (Table 8), Hammill (Table 9) and Beery (Table 10) Tests there were participants who scored under the expected age level and such underachievement indicates some kind of problem a child experiences regarding reading, spelling and writing. There were, however, other subsections in which the same participants had an average and even an above-average performance. This may be in keeping with Davis's theory (1997, 2003) that such individuals "disorientate" when symbols have no meaning to them and this causes them to make perceptual mistakes. Also that their particular perceptual skills cause their disorientation.

To sum up, the remark could be made that it might be expected of a child with a learning problem to have severely sub-normal intelligence scores and/or perceptual and motor scores. This was not the case regarding the present study's participants. This could be in keeping with Davis's (1997, 2003) opinion.

4.1.5 History of participants' social development

It was not very clear whether the learning disorder of the participants who indicated that they had difficulty making friends (50%) had anything to do with this, although a few parents indicated that it indeed had an influence on the child's social interaction with people. It probably has a lot to do with the emotional influence it has on the child (see 3.1.6 and 4.1.6). Woods (quoted in Gorman et al., 2003) said one of the several negative outcomes is that children with dyslexia tend to withdraw from family and friends.

The fact that the children in this research group generally showed positive social conduct, could possibly be attributed to their school where they received a lot of support, where they were not the exceptions and therefore did not have to bear the extra burden of being different. Reports made it clear that many of these children had suffered problems while they were in a main-stream school where they were often teased, could not get along well with friends, did not like school and felt inferior. This is in keeping with Pelser's (quoted in Van Wyk, 1990) point of view about the affective and conduct problems manifested by children with learning disorders. He mentioned that these learners have little self-confidence and self-esteem, have a poor risk-taking attitude, disrupted emotional experiences, poor interpersonal relationships and a negative experience of school.

4.1.6 History of participants' emotional problems and schoolwork motivation (See Tables 11 and 12)

The emotional problems the participants struggled with, for instance withdrawal, feelings of inferiority, depression, feelings of worthlessness, aggression, frustration, fear, sorrow, despondency, and a predisposition to commit suicide, are in keeping with literature indicating that learners with a learning problem often suffer from emotional problems and problems with their self-image (Botha et al., 1999; Newman & Newman, 2003). All the problems that have been mentioned relate to the children's evaluation of themselves in comparison to their peers and the demands made regarding academical skills, such as reading, spelling and writing. The fact that there were participants who, according to their parents, had no emotional problems could possibly be attributed to the way in which others (especially their parents) accepted them, supported them and made then feel safe; to their own specific characteristics and also to the way in which they compared themselves to others (Botha et al., 1999). It therefore seems to be apparent that children with a severe reading disorder do not necessarily have to suffer from emotional, conduct or social problems.

4.1.7 Strong points, interests and ideals (See Table 13)

The fact that there were continuous themes of interest in sport, art, mechanical and technical matters, nature and entrepreneurial issues, which were also reflected in the participants' ideals for the future, is closely in keeping with Davis's opinion that individuals with dyslexia have particular conceptual and perceptual talents (1997, 2003). Shaywitz (2003), the same as Gorman et al. (2003), pointed out that these individuals are very well represented in business, finances, the visual arts and the sciences (see 4.1.2).

4.1.8 Psychological functioning according to the CBCL/6 and the TRF/6-18 (See Tables 14 and 15)

If the characteristics that were evaluated by the CBCL/6-18 and the TRF/6-18 are scrutinised, it becomes apparent that in the first subtest (anxiousness/depression) self-consciousness was the most salient characteristic revealed by most of the participants. This was followed by feelings of worthlessness, nervousness and worrying, which is in keeping with the opinions of Newman and Newman (2003) and Levine (2002), among others, about the effect of failure on a child's psyche.

Another prominent feature was the variety of behavioural patterns presented by these individuals, and this is in keeping with research done by Wood (quoted in Gorman et al., 2003) which indicated that children with dyslexia have a greater chance than children who are non-dyslexic to leave school at an early age, to withdraw from family and friends, to commit suicide or to be imprisoned. The results of the present study showed that the participants tended to withdraw from social interaction (would not talk, were secretive, reticent and sad), they did not abide by rules, told lies, were argumentative, gave disciplinary problems, were stubborn, moody, sulky, impulsive and threw temper tantrums.

It was also clear that many of these children had concentration problems. They did not complete tasks, could not sit still, daydreamed, were inattentive and talked out of turn or too much. The question might be asked whether it is the reading disorder that gives rise to these problems or whether it is the other way round. As has been mentioned previously, Davis (1997, 2003) is of the opinion that the way children with a reading disorder think might be the cause of their concentration problems.

According to the indications of the CBCL/6-18, the psychological functioning of 5 of the 20 learners (thus 25%) was at a clinically diagnosable level and the psychological functioning of 4 more was at borderline level. Strictly speaking this means that 45% of the participants actually needed psychotherapy. According to the educators this number was lower, namely 2 at clinical level and 4 at borderline level, which still means more or less 33% of this group. This might be an indication of the severe psychological influence a reading disorder can have on a child.

4.2 Discussion of the results of the reading and spelling tests

The hypothesis was confirmed that the Davis programme can help individuals with a reading disorder in a short period of time. According to the Wilcoxon test the experimental group that undergone the Davis intervention did significantly better in three of the tests, namely the Schonell silent-reading test ($p = ,00$), the ESSI spelling test ($p = ,01$) and the ESSI reading test ($p = ,01$). Although there had not been a significant improvement in the Schonell one-minute reading test ($p = ,19$), the learners' average loud-reading speed deficit did indeed show a decrease, namely from 58,50 months to 56,50 months. The control group, on the other hand, showed no significant improvement in any of the tests and furthermore did significantly worse in the Schonell one-minute reading test ($p < .02$). Their loud-reading speed deficit increased from 42,40 months to 45,80 months (Table 18).

Many of the participants were very anxious during the retest (this included the members of the control group) and this especially influenced them during the tests where they had to read out loud – the Schonell one-minute reading test and the ESSI reading test. They said they were influenced by the fact that they knew what the testing entailed and felt they had to perform well. These participants had been subjected to so many tests in their lives due to their learning problems, that it was quite difficult to convince them not to be anxious about the tests. Under the circumstances it was difficult not to inform

them what the tests where about. In spite of this the participants in the experimental group still improved significantly.

This means that there could be concluded that the Davis techniques did indeed lead to an improvement in individuals' reading ability within a short period of time. If it is taken into account that the sample was very small and that non-parametrical tests can more readily lead to a Type II error, the results must be regarded as substantially important. In addition there were factors that could have had a negative influence on the results and they should be taken into account. These factors are discussed next.

Although the distribution of the experimental group and the control group initially seemed equal, the qualitative information obtained led to the conclusion that the participants of the experimental group generally speaking had more problems than those of the control group and their improvement should therefore also be regarded against this background. According to the parents the language development of 4 (40%) of the experimental group's participants was late, while only 2 (20%) of the control group were indicated. According to the parents and educators 8 (80%) of the experimental group's participants had not been ready for school, while only 1 (10%) of the control group was indicated. Furthermore all the participants (100%) of the experimental group were identified as in need of special education as early as preprimary school and not later than grade 2, while 5 of the control group's participants were only identified between grades 3 and 5.

According to Table 5 it is clear that the participants of the experimental group generally manifested more typical reading problems before the intervention than those of the control group. Table 11 shows that 9 (90%) of the experimental group's participants indicated that they were not very motivated as far as their schoolwork was concerned and only 5 (50%) of the control group. If this information is taken into account, the experimental group's improvement could from a clinical point of view be regarded as very significant.

Although Stowe (2000) warns against the interpretation of intelligence tests since the difference between the verbal and the non-verbal intelligence scores does not have to be very significant, there was a big difference between these two scores as far as the participants in general were concerned and in addition the experimental group's average difference was bigger than that of the control group (16,20 to 11,20). If a big difference between the verbal and the non-verbal intelligence score is indeed to be considered as a sign of a reading disorder, it would mean that the participants of the experimental group on average had a bigger problem than those of the control group. This would in turn render the improvement in their test results even more significant.

According to the categoric model (Shaywitz, 2003) there is a natural division between fluent and poor readers, but according to the dimensional model there is a continuum on which reading ability and reading inability lie. Shaywitz is of the opinion that most disorders naturally occur in degrees, although there might be a need to be able to refer to the disorder by means of a specific diagnostic label. The point of view of Mash and Wolfe (2002) also is that reading problems can occur on a continuum of reading abilities and most probably do not appear as a discrete phenomenon. Children with reading problems are those at the bottom end of the continuum. If the assumption could be made that the participants of the present study were at the far end of the inability side of this continuum due to the fact that they had been diagnosed as learners with special educational needs at a young age, and the Davis programme helped them, the conclusion could be made that it would possibly present even better results regarding learners with a reading disorder who can still cope in a main-stream school. As far as

the new educational policy of inclusive education is concerned, such an intervention programme could probably provide very positive results.

As mentioned before, there were 3 (30%) of the control group's participants who received aid in the form of audio recordings and transcription and 4 (40%) of the experimental group (see 2.2.1). This could perhaps indicate that the control group had slightly fewer problems regarding reading than the experimental group. Although the difference was slight, it could be taken into count when considering the results of the programme. It could perhaps also be used to place the experimental group's results in an even better perspective.

Shaywitz (2003) mentions that phonic instruction teaches children how to sound words and to pronounce them and that this promotes reading accuracy and reading comprehension, but that the older children get, the more difficult the words get and then the effect of this kind of instruction becomes less and less effective regarding a child's spelling. The fact that the participants were between 10 and 15 years of age and still improved significantly in their reading and spelling tests, can most probably be regarded as further proof of the Davis programme's efficacy.

Furthermore Shaywitz (2003) says that word identification alone is not enough to determine whether a child has a reading problem or not. The individual has to read slowly in general. The fact that the experimental group's silent-reading scores improved, could indicate that they were reading more fluently after the intervention, but that they found it difficult due to tension to identify single words, especially during the one-minute reading test that tests speed. This might have caused disorientation, since they had no had enough time to let the Davis orientation process take place automatically. It has to be taken into account that the participants had much less time than the usual Davis course presents.

Some participants received the intervention at home and others at school. The problem in both cases was that the circumstances were not always suited for this kind of programme. There was often a lot of noise from the environment as well as other disturbances. A peaceful and quiet atmosphere is recommended for this kind of intervention. The working surfaces were also not always equally suited, although this did not seem to bother the participants too much. The programme requires a working surface that is quite big. The person who presents the intervention must be able to sit opposite the participant and must also be able to move with ease. This was not the case under all the circumstances. The fact that the participants performed well in spite of these circumstances could be regarded as a further sign of the programme's efficacy.

Although the Davis programme is supposed to be preformed over a much longer period of time and only certain techniques were used, the study showed that within less than 14 hours of intervention a significant improvement had taken place in the participants' reading ability. There is a clear indication that this programme can render positive results within a short period of time and that it could therefore also be regarded as time and cost effective. This is especially significant if the requirements made by Shaywitz (2003) regarding successful learning intervention are taken into account. She mentions early, high-quality intervention of 90 minutes per day over a period of 1 to 3 years. This makes it clear that the Davis programme (even if not in all cases) could at least be of great aid to many individuals within a short period of time. Not all the learners in the experimental group individually improved to an equal extent, but Davis's claim (1997, 2003) to 90% success is for instance supported by the scores of the Schonell silent-reading test. Furthermore 80% of the participants improved in the ESSI reading and spelling tests.

Shaywitz (2003) adds that this is hard work, demands a lot of interaction and the attention of the individual has to be kept. With the Davis programme there are very few problems of keeping the individual's attention since it entails a lot of interaction and the individual is kept involved constantly. The participants of the present study received the intervention in the afternoons after school and each session lasted 2 hours. They never complained of being tired or bored. They also showed very fews signs of concentration problems, even those whose parents or educators indicated that they had problems concentrating. In view of the significant improvements that had taken place, it would perhaps be applicable to have a further look at the participants' strong characteristics and their interests to try and ascertain whether this is in keeping with Davis's statement (1997, 2003) that dyslexia is a gift, that individuals with dyslexia have the ability to think non-verbally and creatively and that this is the reason why his techniques work. With reference to the information obtained from the questionnaires (Appendices 1, 2 and 3) and from conversations with the participants during the intervention, it was striking how many of these learners were interested in art and were good at it, were technically or mechanically talented, and had an interest in entrepreneurial enterprises. This supports Davis's whole premise regarding learning disorders and the way in which it can be approached.

In America effective scientifically grounded reading programmes are funded. Since 2001 the slogan has been that no child may be left behind (Gorman et al., 2003; Shaywitz 2003). There are also programmes available for older children and the parents of children with reading problems. At this stage such sources are not necessarily available in South Africa. The American programmes could perhaps be used for English speaking individuals, but it still would have to be adapted since these programmes are aimed at the American reader and use the distinctive American spelling and grammar. The Davis techniques are ready to be used for any individual of any age in any country. The only adaptation that has to be made has to do with vocabulary, dictionaries and readers, but they do not have to be particular readers. Those that are available can be used.

4.3 Discussion of the results of the psychological tests

The hypothesis was confirmed that the Davis programme can have a positive effect on the psychological functioning of individuals with a reading disorder. The results of the retest clearly showed an improvement and a further improvement was shown after the follow-up test that was performed after 12 weeks without any intervention. In 12 of the 17 subtests there had been a significant improvement ($p < ,05$) and the remaining 5 subtests' t-scores had decreased throughout although this improvement was not scientifically significant. In the follow-up test 5 of the 12 subtests' significant improvement had been maintained and in the other 7 there had been a further improvement. The one-way p-values were taken into account with $p < ,05$. The conclusion to be drawn is that the Davis programme not only has the ability to improve participants' psychological functioning but, that this improvement can be maintained and even improved. This means that over time it can have an escalating positive effect on participants.

By merely taking into account the average t-scores of the experimental group's pre-, re- and follow-up tests it seems as though the subtests in which there had been the biggest improvement with a decrease of more than 5 (the border between normal and clinical) in the average of the t-scores, were the following: anxious/depressive (9,2), somatic complaints (11,4), thought problems (6,40), aggressive behaviour (5,7), problem internalising (14,3), problem externalising (8,7), problems: total (12,5), affective problems (8,3), anxiety problems (7,9) and somatic problems (8,0). The subtests in which there had been a decrease of less than 5, were: withdrawn/depressive (4,4), social problems (4,3), attention problems (4,1), rule-breaking behaviour (1,9), attention deficit/hyperactivity problems (4,2) oppositional defiant

problems (4,0) and conduct problems (3,10). Looking at Tables 14 and 15 the conclusion could be made that these attention and conduct problems in which there had not been such an improvement actually were the psychological areas in which there had been the biggest difficulties before the intervention. Yet there were signs of an improvement after the intervention. Davis (2003) has developed specific techniques for individuals with attention deficit/hyperactivity problems, which have not been used in the present study due to its focus on reading problems.

The control group, just as the experimental group, significantly improved in the subtest anxious/depressed (p = ,02) which might imply an extraneous variably having an influence on both groups that had not been provided for in the study. The mere fact that the participants in the control group took part in the research process has to be taken into account since this might have had a placebo effect on them that could have reduced their anxiety.

The fact that the control group improved significantly concerning attention problems (p = ,02) and attention deficit/hyperactivity problems (p = ,00), while the experimental group did not improve significantly, can possibly also be attributed to an extraneous variable since the experimental group's t-scores in these subtests had also improved although not significantly. The experimental group's p-values in these two subtests do show a significant improvement in the follow-up test, but once again it cannot be said that the intervention was the cause of this. Since both the groups show similarities regarding these two tests their results should not be taken into account (see CHAPTER 5).

As Brown and Mankowski as well as Brown and Gallagher (quoted in Newman & Newman, 2003) found, children learn about success and failure from experiences that challenge their skills. During the programme the participants acquired new skills and this could have contributed to the mainly positive results the CBCL/6-18 showed. Since these children had already met with so many failures in their lives, the experience of many positive outcomes during the intervention could have contributed to a better self-validation.

The same authors also said that children often discover during their first school years (grade 1 to 4) that their skills do not meet the demands of school life and this has a negative influence in their self-image. The participants in the experimental group were all diagnosed with a learning disorder between their preprimary school year and grade 2 and therefore were exposed to social evaluation at a very early age. There were indications that to a certain degree all of them suffered from some form of psychological malfunctioning that improved significantly after the Davis intervention. Their psychological functioning improved significantly as far as the following aspects are concerned: anxiety and depression; somatic complaints; thought, affective, anxiety and conduct problems; as well as their rule-breaking, aggressive and oppositional defiant behaviour was concerned. Furthermore, there had also been a significant decrease in their internalising and externalising of problems. According to the CBCL/6-18 pretest 3 of the participants in the experimental group's scores regarding the internalising and externalising of problems were at a clinical level while they returned to normal after the intervention. Only 1 participant's scores regarding the externalising of problems were still indicated as borderline scores. A conclusion might be drawn that the Davis programme would be particularly effective if it could be applied before a child with a learning disorder has become too severely affected psychologically speaking.

On the other hand it has to be taken into account that the experimental group possibly only improved significantly due to the fact that they received individual attention as well as a lot of positive feedback,

and also experienced a feeling of achievement. Crooks (quoted in Newman & Newman, 2003) refers to the fact that children depend on the feedback of others to assess their own abilities and during the intervention there were many such opportunities. They could possibly have assimilated such positive feedback in their self-image. Zambo (2004) comes to the conclusion that it benefits such learners if they are told about the dyslectic brain. The information they obtain helps them to understand themselves better and contributes to an improved self-esteem. In the light hereof it could possibly be concluded that the Davis programme contributes to improved psychological functioning since participants are informed about the way their minds (brains) work and the fact that they are different precisely because their minds function differently and not because there is something wrong with them (Levine, 2002). Because it is administered individually the success of the Davis programme could possibly also be attributed to the relationship between the therapist and the participant, but this was not part of the research programme.

CHAPTER 5

RECOMMENDATIONS AND CONCLUSION

There are many issues that have to be taken into account regarding scientifically grounded reading approaches. According to the results of the present study there are significant signs that the Davis programme can have a positive influence on individuals' reading ability and psychological functioning. It would obviously have been better if the sample had been bigger, but there were many practical problems involved in obtaining a group that would have been big enough and also representative enough. The groundwork has, however, now been done for further research regarding this field.

Something that will have to be taken heed of is trying to prevent the participants from becoming aware of the implications of the tests, especially if they previously have been exposed to testing. It causes unnecessary anxiety and this can influence the outcome. The participants in the present study were very anxious, especially during the retests, and this could possibly be ascribed to the fact that they had been informed about the aim thereof.

It is also important to see to quiet and tranquil surroundings and a satisfactory working area. These are prerequisites for the Davis programme.

Shaywitz (2003) remarked that individuals with a reading problem should be given continuous text rather than word-identification tests for loud reading. Another challenge of the present study was to find such a standardised measuring-instrument. In America there apparently are such instruments but in South Africa there are, excepting the ESSI tests, no modern standardised instruments to help ascertain whether a certain intervention is successful or not. It would probably have been better to measure the participants' reading speed by means of continuous text, but it would have created problems regarding validity and reliability.

The question whether individuals whose non-verbal intelligence scores are significantly higher than their verbal scores are more inclined to present with a reading disorder, deserves further investigation.

Research done by Shaywitz (2003) with fMRI techniques showed that phonic instruction has an influence on the development of the left-brain systems and that the developmental pathways of the right hemisphere become less prominent. They then become more comparable to those of accurate and fluent

readers. Research could possibly be done in the same way to ascertain what effect the Davis programme has on the brain.

The researcher only concentrated on the Davis techniques that are directly involved in reading problems. Davis's other techniques (2003) that are aimed at individuals with attention deficit/hyperactivity disorder, mathematics and handwriting problems could also be researched. Especially regarding the first-mentioned it could be worthwhile to ascertain whether these techniques indeed deliver significant results in view of the fact that there had been quite a number of participants in the present study who struggled with attention deficit/hyperactivity problems.

Since the longitudinal study in the USA of Pfeiffer et al. (2001) indicated that the Davis techniques adapted for younger schoolchildren (*Davis Learning Strategies*) can benefit any learner, also learners who do not have a learning disorder, it could possibly provide an alternative reading method within the South African context. Although this would mean discussions with the Davis Association, it might be considered, especially in view of the present problems with literacy among South African children. For children from communities where the preschool education is poor, for situations where poverty reigns and resources are insufficient, even in over-crowded classrooms, these techniques could probably be very useful.

The conclusion is that, should the Davis programme merely be used as an alternative method for individuals with a reading disorder, it would help a large group of individuals to read that would hold many benefits for their future development - a new life - and this as such is important enough.

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APPENDIX 1: QUESTIONNAIRE FOR PARENTS

QUESTIONNAIRE FOR PARENTS

1. Child's full names and surname:_____
2. Name called by:_____
3. Gender:_____
4. Date of birth and age:_____
5. Grade:_____
6. Home language:_____
7. School:_____
8. Father's occupation:_____
9. Mother's occupation:_____
10. Age when mother started working (if applicable):_____
11. Marital status:_____
12. If divorced, how old was child during divorce?_____
13. If remarried, with whom does child reside?_____
14. If adopted, at what age was child adopted?_____
15. How many children in the family? (Please indicate age and gender.)_____
    _____
    _____
16. What is the position of the child in the family (for instance oldest/youngest)?_____
17. Developmental history:
    - If there were any prenatal problems please indicate them:_____
      _____
    - Child's birth weight:_____
    - Was birth normal or were there any complications? If complications, please explain:_____
      _____
      _____
    - Children's diseases child had:_____
      _____
      _____
    - Any other serious/chronic diseases, such as heart disease/allergies: _____
      _____
      _____
    - At what age did the child reach the following milestones:
      sitting:_____
      crawling:_____
      standing:_____
      walking:_____
      talking:_____
    - At what age did the child speak in such a way that others could understand?_____

- Describe any behavioural problems, such as hyperactivity, concentration problems, emotional problems: _____

_____

_____

18. Indicate whether the child is using any medication, and what it is being used for:_____

_____

_____

19. If the child has hearing problems, indicate the degree of the problem and who determined the problem:_____

_____

20. If the child has any eye problems, indicate the degree of the problem and who determined the problem:_____

_____

21. Did the child attend any day-care facility/nursery school/preprimary school?_____
22. If so, indicate at what age he/she started and till when:_____

_____

23. Describe the child's emotional development (indicate for instance whether the child was ready for school and whether he/she is at the same emotional level than children of his/her own age):_____

_____

_____

24. Does any of the other children in the family have learning problems (if applicable)?_____
25. If so, indicate the age and gender of the child(ren) as well as the kind of problem:_____

_____

_____

26. Does/did any of the parents have a learning problem? If so, indicate which parent as well as the nature of the problem:_____

_____

_____

27. When did you start noticing that the child might have a learning problem?_____

_____

28. Did you notice it first or did the school inform you about it?_____

_____

29. If you noticed it yourself, what were the signs that made you suspect that your child might have a problem?_____

_____

_____

30. Problem areas that the child has presented with since he/she was still very young and/or still presents with. Indicate and provide a short explanation where possible:
    - Late language development_____
    - Spelling problems:_____

- Letter transposition, for instance writes *dam* instead of *mad:*_____
_____
- Punctuation marks and capital letters are omitted when writing:_____
_____
- Reversal of letters, syllables and words when writing:_____
- Construction of written sentences not age-appropriate:_____
_____
- Grammar mistakes, for instance incorrect plurals or diminutives:_____
_____
- Untidy or illegible handwriting:_____
- Confuses words that can be read in both directions, for instance *dam* instead of *mad:*_____
- Reverses letters and numbers when he/she has to identify them while reading:
_____
- Loses place while reading:_____
- Loud-reading problems – for instance has to concentrate very hard, reads slowly and laboriously, reads inaccurately, guesses words:_____
_____
- Poor comprehension during loud-reading:_____
- Poor comprehension during silent-reading:_____
- Poor comprehension when being read to, watching TV, video or movie:_____
_____
- Avoids reading activities:_____
- Limited vocabulary (written/spoken):_____
_____
- Sounds/words mispronounced, especially names, foreign, long or difficult words:_____
- Little interest in school and poor motivation due to failure:_____
- Finds it difficult to learn:_____
- Does not know how to learn actively – learning style not yet established:_____
_____
- Limited ability to concentrate:_____
- Problems balancing:_____
- Poor sense of direction:_____
- Hyper-/hypo-active (over/underactive):_____
- Excessive daydreaming:_____
- General knowledge:_____

31. Has the learner undergone any form of intervention for his/her problem?_____
32. If so, specify
    - the nature of the intervention:_____
    - the duration:_____
    - the child's relationship with the person who administered the intervention:_____
    _____

33. When did your child start attending the present school?_____
34. Did it have a influence on your child's learning problem and general self-image ? Explain:
_____
_____
35. Provide any information concerning the relationship between the members of the family, especially regarding the child in question: _____
_____
_____
36. How regularly does your child do his/her work, especially schoolwork?_____
_____
37. What responsibilities does the child have at home?_____
_____
_____
38. Describe the child's social development, such as his/her relationship with his/her friends, does he/she find it easy to make friends, does he/she have many friend or only a few?_____
_____
_____
39. As far as you are concerned, to what extent does your child's learning problem influence his/her personality, self-esteem and/or behaviour?_____
_____
_____
40. Name your child's strong points. (Personality, organisation, sport, art, anything that is striking. Mention accomplishments.)_____
_____
40. What particular interests does your child have? (Anything in which he/she is interested and/or is knowledgeable about, such as sport, animals, computers.)_____
_____
_____
41. Mention any other issues that you would regard as important concerning his/her school and/or social situation and/or learning problems:_____
_____
_____
_____
_____

APPENDIX 2: QUESTIONNAIRE FOR EDUCATORS

QUESTIONNAIRE FOR EDUCATORS

1. Learner's full names and surname:_____
2. Name called by:_____
3. Gender: _____
4. Grade:_____
5. Boarder/not:_____
6. Has the learner completed the JSAIS/SSAIS-R? Indicate which._____
7. If so, when?_____
8. What do the subtest–scores indicate?_____
   _____
   _____
9. The names and results if other intelligence/aptitude tests completed: _____
   _____
   _____
   _____
10. Academic performance from grade 1 to the present time, if available. (Indicate the grade, year and average mark/percentage for Afrikaans, English and Mathematics as well as the grand total):

Grade and year	Afrikaans	English	Mathematics	Grand total

11. Problem areas. Indicate the areas and provide a short explanation where possible:
    - Late language development:_____
    - Spelling problems:_____
    - Letter transposition, for instance writes *dam* instead of *mad:*_____
      _____
    - Punctuation marks and capital letters are omitted when writing:_____
      _____
    - Reversal of letters, syllables and words when writing:_____
    - Construction of written sentences not age-appropriate:_____
      _____
    - Grammar mistakes, for instance incorrect plurals or diminutives:_____
      _____

- Untidy or illegible handwriting:_____
- Confuses words that can be read in both directions, for instance *dam* instead of *mad:*_____
- Reverses letters and numbers when he/she has to identify them while reading: _____
- Loses place while reading:_____
- Loud-reading problems – for instance has to concentrate very hard, reads slowly and laboriously, reads inaccurately, guesses words:_____ _____
- Poor comprehension during loud-reading:_____
- Poor comprehension during silent-reading:_____
- Poor comprehension when being read to, watching TV, video or movie:_____ _____
- Avoids reading activities:_____
- Limited vocabulary (written/spoken):_____ _____
- Sounds/words mispronounced, especially names, foreign, long or difficult words:_____
- Little interest in school and poor motivation due to failure:_____
- Finds it difficult to learn:_____
- Does not know how to learn actively – learning style not yet established:_____ _____
- Limited ability to concentrate:_____
- Problems balancing:_____
- Poor sense of direction:_____
- Hyper-/hypo-active (over/underactive):_____
- Excessive daydreaming:_____
- General knowledge:_____

12. What is the learner's schoolwork like in general?_____ _____
13. How often does the learner do his/her homework? Always/usually/irregularly?_____
14. What is the learner's school attendance like?_____
15. Has the leaner attended any other schools?_____
16. If so, name school/schools and period(s) of time:_____ _____ _____
17. Has the learner repeated any grade/grades?_____
18. If so, mention grade/grades and year/years:_____
19. Describe learner's conduct in school:_____ _____ _____
20. Describe learner's attitude towards you:_____ _____

18. Describe learner's attitude towards other learners in his/her class:_____
_____

22. Describe learners responsibilities in class (if any):_____
_____

23. Describe how learner socialises in the classroom as well as outside as far as you know:_____
_____
_____

24. Participation in sport and/or accomplishments:_____
_____
_____

25. Other strong points (such as artistic talent, leadership, creative thought). Indicate accomplishments: _____
_____
_____
_____

26. Domestic background:
    - Have you met the parents?_____
    - Are they supportive? Explain:_____
_____
_____
    - Are they interested in the school and the learner? Explain:_____
_____
    - Describe their attitude towards the school: negative/positive. Explain:_____
_____
    - Do you know whether the parents take note of the learner's homework and see to it that the work is done? Explain:_____
_____
    - Do the parents react to school correspondence:_____

27. Please provide any other information that you may deem to be important with regard to the learner, such as self-esteem, adjustment and/or behaviour._____
_____
_____
_____
_____

APPENDIX 3: QUESTIONNAIRE FOR LEARNERS

QUESTIONNAIRE FOR LEARNERS

1. Full names and surname:_____
2. Name called by:_____
3. Gender:_____
4. Date of birth and age:_____
5. Grade:_____
6. Home language:_____
7. School:_____
8. Problem areas that you have presented with since you were still very young and/or still present with. Indicate and provide a short explanation where possible:
   - Spelling problems:_____
   - Letter transposition, you for instance write *dam* instead of *mad:*_____ _____
   - Punctuation marks and capital letters are omitted when writing:_____ _____
   - Reversal of letters, syllables and words when writing:_____
   - Construction of written sentences not age-appropriate:_____ _____
   - Grammar mistakes, for instance incorrect plurals or diminutives:_____ _____
   - Untidy or illegible handwriting:_____
   - You confuse words that can be read in both directions, for instance *dam* instead of *mad:* _____
   - Reverse letters and numbers when you have to identify them while reading: _____
   - You lose place while reading_____
   - Loud-reading problems – for instance you have to concentrate very hard, read slowly and laboriously, read inaccurately, guess words:_____ _____
   - Poor comprehension during loud-reading:_____
   - Poor comprehension during silent-reading:_____
   - Poor comprehension when being read to, watching TV, video or movie:_____ _____
   - You avoid reading activities:_____
   - Limited vocabulary (written/spoken):_____ _____
   - Sounds/words mispronounced, especially names, foreign, long or difficult words:_____
   - Little interest in school and poor motivation due to failure:_____
   - Find it difficult to learn:_____
   - Do not know how to learn actively – learning style not yet established:_____ _____

- Limited ability to concentrate:_____
- Problems balancing:_____
- Poor sense of direction:_____
- Hyper-/hypo-active (over/underactive):_____
- Excessive daydreaming:_____
- General knowledge:_____

9. What influence has the intervention you previously had had on your learning problem?_____
_____

10. What influence has the intervention you have had at your present school had on you leaning problem?_____
_____

11. How regularly do you do your homework? Supply reasons:_____
_____

12. Supply any information concerning the relationship between the members of your family, especially your relationship with your parents and your siblings:_____
_____
_____

13. Describe your relationship with the other learners in you class and with other people besides members of your family? _____
_____
_____

14. Describe the influence your so-called learning problem has had on you personally:_____
_____
_____
_____

15. Describe your strong points. (Personality, organisation, sport, art, anything that stands out):_____
_____
_____
_____
_____

16. What particular interests do you have?_____
_____
_____
_____
_____

17. Describe your dreams and ideals:_____
_____
_____
_____

APPENDIX 4: INTERVENTION PROGRAMME

INTERVENTION PROGRAMME

Session 1

- Talk to the learners in the experimental group to make them feel at ease, but also to motivate them and to explain to them that they have to assume responsibility for their participation and involvement in the intervention programme. They must be willing to participate. The researcher is a facilitator and the learners have to co-operate, otherwise no change will be possible.

- Each learner is evaluated to ascertain whether *Orientation Counseling* can be done to help him/her gain orientation status. This is called the *Davis Perceptual Ability Assessment* and entails visualisation. It a brief form of evaluation that helps indicate the learner's preferred style of thinking.

- If the learner finds it easy to follow all the steps, *Orientation Counseling* is performed. If not, the *Alignment* procedure is followed. This is meant for learners who are mainly kinesthetic or tactile learners and for those younger than 7 years of age. This, however, did not fall within the parameters of the present study, due to the fact that it could be construed as an extraneous variable. The *Orientation Counseling* helps to establish an orientation point that enables the learner not to disorientate. Visualisation is used.

- After the orientation point has been established, the learner is given some relaxation exercises that help him/her to eliminate stress and tension. This is called the *Release* procedure.

- Hereafter follows the *Review* procedure, a simple way of helping the learner to initially control the position of the orientation point after the original orientation session.

Sessions 2 and 3

- *Fine-tuning for Orientation Counseling:* This is a method whereby the learner is enabled to find the best orientation point. This is also attained by means of visualistion.

- *Co-ordination therapy:* If the learner demonstrates poor co-ordination or delayed motor development, these exercises can be added from this point onward. Small bean bags (koosh balls) are thrown towards the learner while he/she balances on one foot and remains orientated. This also helps the learner to cross the midline.

From this point onward the most important issue is that the learner must remain orientated. If there are signs of confusion or if the learner gets stuck, he/she must be asked to orientate. When the learner shows signs of exhaustion, he/she must be given a break. A good break activity is the co-ordination therapy.

Start with *Symbol Mastery*: *Alphabet Mastery*.

First control the orientation point (OP). The facilitator provides paper strips on which the letters of the alphabet have been printed (upper and lower case) as well as modelling clay. During this session the learner is provided with a strip of paper containing upper-case letters. The learner then has to mould strips of clay, cut off the required lengths and form the letters of the alphabet according to the examples on the strip of paper. The clay letters are placed next to each other and the learner must say each letter's name as he/she completes it.

During the research project cardboard squares were used for these letters, since the work could not always be completed in one session. The squares were then kept in a safe place until the next session when the work could be resumed.

The learner *compares* his/her clay letters with the printed version and mistakes are corrected. The facilitator provides help when necessary without criticising the learner's work. The facilitator also takes note of the letter(s) with which the learner struggles.

Then the learner *touches* each letter from A–Z and says each one's name. If he/she makes a mistake and/or if the learner hesitates, the facilitator asks questions to lead the learner to the correct name.

Then the learner *touches* each letter from Z-A and says the name. Once again the researcher helps.

Then the learner *looks* at the letters from A-Z and says each letter's name. This is once more repeated from Z-A.

Then the learner has to say all the names of the letters from A-Z *without looking at them.* This is repeated from Z-A. He/she may look at the letters if he/she gets stuck. If the learner hesitates at the same letter repeatedly, the OP must be checked. Ask questions such as, "What is the same/differs?" or "Name words starting with this letter."

Keep on doing this until the learner can say the letters from A-Z and Z-A without hesitation and without looking.

Sessions 3 en 4

- ***Symbol Mastery*** continued: Repeat everything with the lower-case letters as with the upper-case letters, but *start with z and end with a* initially.

  Repeat until the learner can recite the upper- and lower-case letters of the alphabet fluently from memory. Then the learner can be asked to repeat the names of the letters as pointed out at random by the facilitator and additional exercises can be done to embed the alphabet. Words can be looked up in a dictionary, surnames in a telephone directory, different fonts can be looked at in magazines, letters can be identified and their written form can be practiced.

Sessions 4 and 5

- ***Punctuation marks*** are made with clay, named, touched and their functions discussed.

  The following punctuation marks are modelled and discussed: full stop (period), comma, question mark, exclamation mark, semicolon, colon, dash, parentheses, brackets, quotation marks, ellipsis, slash (virgule), hyphen, apostrophe.

- ***Numerals from van 0 tot 10*** are modelled. Above each numeral the correct number of clay balls are placed in a column. Underneath each numeral comes the name spelled in clay. The learner in turn points at the balls, the numeral and the word, indicates what the number is and that it means the number of balls above it.

- ***Create a new word.*** The learner creates something in clay that represents an idea, an action, an object that is the learner's own invention. He/she must say what its function is, must provide it with a made-up name and then make the name in letters of the alphabet. It can be spelled any way the learner wants to spell it. This is done to establish the purpose of words and especially the written form.

Sessions 6 to 8

- *Procedure with ordinary words*

  The same is done with existing words using words with different functions, such as verbs, nouns and adjectives. Simple words are used and each word's meaning is looked up in a dictionary. Only one definition is used where more that one definition is involved. If the learner struggles, the facilitator helps. It is important that the learner must know what the word means. The learner then makes a clay model of the concept and also spells the word in clay placing it underneath the model. If the word has more than one definition a model must be made that depicts each meaning. Build as many words as time allows.

- *The small words* (List at end of programme)

  Let the learner read through the list and then choose those that made him/her disorientate. The learner looks up the word in a dictionary, models the concept in clay, and models the word in clay, just as in the previous exercises.

- ***Reading techniques:*** These are used when the learner starts to do *Symbol Mastery* on the small-word list:

- Spell reading:

  Start at a much lower level than the grade in which the child is. As soon as the reader can read most of the words at this grade correctly, the next level may be attempted. The learner spells each word and then reads it. The facilitator helps where necessary. The learner is reminded to remain orientated. This technique is not meant for comprehension. The goal is simply to help the learner recognise letters and words and also to train his/her brain and eyes to read form left to right.

  Sweep-Sweep-Spell:

  The facilitator covers the words in a line and then slowly opens up one by one word with a piece of paper or a ruler. The learner must try and read each word. A word may be swept twice. If the learner still cannot read the word, it has to be spelled and then pronounced. The facilitator helps. Again the aim is not comprehension, but recognition and training the brain and eyes to read from left to right.

  Picture-at-Punctuation:

  The goal is full and complete comprehension. The learner reads up to a punctuation mark and explains what he/she has read. He/she is asked to form a picture in his/her mind of what has been read. Then reading is continued and the process repeated.

After the programme was completed, the learners were asked to try and maintain the work (see Appendix 5). They had to look up the meanings of words they struggled with (parents and educators could help), model it in clay and spell it in clay as well. They were reminded to orientate when they got confused or hesitated. The idea was that they would, in time, learn to orientate automatically. As with any programme good results depend on maintenance.

LIST OF SMALL WORDS (not all the words provided by Davis, 1997)

a
about
again
ago
almost
also
an
and
another
any
anyhow
as
at
away
back
be
become
before
between
but
by
can
come
do
down
each
either
else
even
ever
every
everything
for
from
front
full
get
go
have
he
he's
her
hers
him
his
how
I
if
in
into
isn't
it
its
it's
just
last
leave
least
less
let
let's
like
make
many
may
maybe
me
mine
more
most
much
my
neither
never
no
none
nor
no
now
of
off
on
one
onto
or
other
others
otherwise
our
ours
out
over
put
run
same
see
she
she's
shall
should
so
some
soon
stand
such
sure
take
than
that
that's
the
their
theirs
them
then
there
there's
these
they
they're
this
those
through
to
too
unless
until
up
upon
us
very
we
we're
what
when
where
where's
whether
which
while
who
who's
whose
why
will
with
within
without
won't
would
yet
you
your
you're
yours

APPENDIX 5: MAINTAINING THE PROGRAMME

MAINTAINING THE PROGRAMME

Start you own "dictionary":

- **Spell reading**

  Spell each word and pronounce it. If you cannot pronounce it, write it down in your "dictionary" and ask somebody to pronounce it for you (your mother/father/educator). Find out what it means, also form the dictionary. Model the meaning of the word in clay and spell the word in clay.

  See if you can write the word without looking in your "dictionary". Check the spelling. If you spelled it incorrectly, you must try and get a clearer picture of the meaning in your mind and adjust your clay model.

- **Sweep, sweep, spell**

  Sweep over each word once or twice with a piece or paper or ruler and try to pronounce it. If you cannot, follow the steps mentioned under spell reading.

- **Reading for comprehension**

  Read up to each punctuation mark and form a picture in your mind of what you have just read.

- Remember to **orientate** whenever you get stuck or cannot read a word.

- Try to practice reading and spelling each day for at least **10 minutes.**

- Ask someone to help you **revise** each week's words.

- Remember that this is a **process** and you must not stop doing it.