

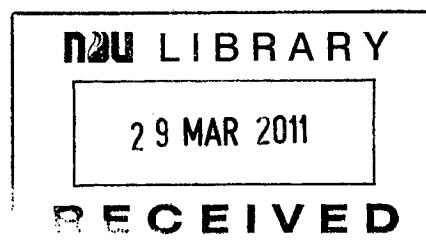
**DYSLEXIA:  
A CASE STUDY ON MULTISENSORY METHODS OF TEACHING**

A Thesis  
Submitted in partial fulfillment  
of the requirements for the degree of  
Master of Arts in English / Applied Linguistics

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Spring 2005



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## DEDICATION

This work is in memory of my mother, Marie Nader – Hojeij, whose influence is great on everything I do. Although she is no longer with us, she is ever present in all I do. Her memory is my motivation.



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## Abstract

This thesis presents the results of a case study that investigates the use of a variety of teaching methods, based on a multisensory approach, as part of the remediation program of dyslexic students in elementary English classes. In order to do this, a review of the literature surrounding the main concepts of disabilities has been carried out, in which the theory of learning disabilities is explained and then linked to dyslexia. Then, a discussion of the different teaching methods that are used in a dyslexic classroom is presented.

A research pilot case study, which is presented in the form of a series of sessions, was undertaken. The pilot case study was based on the monitoring of elementary school children. Five students in the fourth grade participated in this study, which was conducted in the Learning Support Department of a school in the Metn, Lebanon.

It was found that after seven sessions of instruction, the students (n=2) who were instructed following a multisensory approach, performed higher in class than did the students (n=3) whose instruction did not include any multisensory work. Keeping in mind all the variables involved in this pilot case study, such as the relatively small number of students observed, and the time constraints, it was concluded that following a different methodology based on a multisensory approach to teaching dyslexic students proved to be more effective.

## Chapter One: Introduction

Speech and language problems are often the earliest indicators of a disability in learning. People with academic skills disorders are often behind their classmates in developing reading, writing or arithmetic skills. Lerner (1997) briefly notes the common characteristics of disabilities in learning found in most definitions. First there are the disorders of attention. Students have short attention spans and cannot focus in class. They can easily be distracted, and may even have attention-deficit disorders (ADD). The second feature is having poor motor abilities. Students are often awkward and clumsy because of spatial problems. The third characteristic is the perceptual and information processing problems. Students have problems in processing auditory and visual information or in short-memory tasks. Next is the failure to develop and mobilize cognitive strategies for learning. Many students have no organization skills and do not know how to study. Another feature is having oral language difficulties. Students have problems with listening, speaking, vocabulary development, and basic language. The sixth characteristic is reading difficulties. The majority of students with learning disabilities have problems with reading. They cannot decode words nor do basic reading comprehension. Next, there are written language difficulties. Students do very poorly with written tasks because writing is very difficult for them. The eighth characteristic is mathematical difficulties. Students have problems with arithmetic, time, space, and calculation facts. The ninth and final characteristic according to Lerner (1997) is inappropriate social behaviors. Students with learning disabilities have problems with social skills. They do not know how to act in social situations and have a hard time making and keeping friends.

Some studies suggest influences of gender differences when dealing with learning disabilities - LDs. Lerner (1997) believes that more boys than girls are identified as having learning disabilities, precisely four boys for every one girl. However, recent research suggests that girls with learning disabilities constitute an under-identified group because boys “exhibit more physical aggression and loss of control, whereas girls exhibit more problems in the cognitive, language and social realm” (p. 17). Boys have more problems with “visual-motor abilities, spelling, and written language mechanics, whereas girls with learning disabilities have more severe academic achievement deficits in some aspects of reading and math” (p. 17). Lerner (1997) offers three reasons why more boys are identified with learning disabilities. First, there are biological causes. Boys are biologically more vulnerable to learning disabilities. The second cause is the cultural factors involved. Boys exhibit more disruptive behaviors than girls; therefore more boys may be identified with disabilities. Finally, the expectation pressures to succeed are much greater for boys than for girls, thus putting boys under tremendous stress and so they may be clearly identified if they have any disability.

Additionally, Palombo (2001) states that the standard for diagnosing disabilities of learning differs between boys and girls. The reason for this difference is that boys tend to cover their learning difficulties with conduct problems. They act out their learning disabilities through behavioral problems and not academic achievement. Girls, on the other hand, are sometimes overlooked because they are not expected to excel in some subjects. For instance, boys are expected to be better than girls at mathematics, and so if a girl performs lower than a boy in this subject, not much thought is given to the possibility of her having a learning disability. Palombo (2001) believes that boys are

'overrepresented' because they exhibit behavioral problems more than girls, which leads to their identification as having LDs.

The American Psychiatric Association (2000) lists categories of disorders that affect learning. It lists Learning Disorders as the second type of disorder after mental retardation. The association mentions four subcategories under Learning Disorders: Reading Disorder, Mathematics Disorder, Disorder of Written Expression, and Learning Disorder. Understandably, a definition of LDs is first in order to set the framework for this study. According to the American Psychiatric Association (2000):

"Learning disabilities are diagnosed when the individual's achievement on individually administered, standardized tests in reading, mathematics, or written expression is substantially below that expected for age, schooling, and level of intelligence. The learning problems significantly interfere with academic achievement or activities of daily living that require reading, mathematical, or writing skills. The term 'substantially below' is defined as discrepancy of more than two standard deviations between achievement and IQ" (p. 48).

Moreover, the American Psychological Association says that a language disorder may be diagnosed if,

"An individual's difficulty with language interferes with academic or occupational achievement with social communication. There may be underlying abnormalities in cognitive processing (e.g. deficits in visual perception, linguistic processes, attention, or memory, or a combination of these) that often precede or are associated with Learning Disorders" (p. 50).

In this thesis, chapter two will discuss learning disabilities (LDs) in details referring to additional definitions, types, and causes of LDs. Chapter two will place dyslexia in a learning environment, as one of the major types of LDs. Chapter three will define dyslexia, explain types and causes of the disorder, and discuss the various teaching methods involved when dealing with dyslexia. Chapter four will include a presentation of the case study method including an explanation of sample, instrument, design and

procedures followed in the pilot case study. Results and discussion of the findings will be presented in chapter five. Finally, chapter six will present conclusions including the limitations and implications of the case study.

The research question to be answered in this pilot case study is: Would following a multisensory approach as a teaching method improve the academic performance of fourth grade dyslexic English students as compared to the same group of fourth grade dyslexic English students not exposed to multisensory methods?

Based on readings and classroom observations, I believe that there should be more emphasis on the use of ears, mouth and hands. This multisensory approach was completely ignored in the learning support program at the school in question. As a result and despite the importance of the book being used, *Alpha to Omega*, the students are not improving or benefiting. The case study focused on multisensory work because when a child hears a sound, sees it represented visually, and feels it being produced in his mouth and reproduced with his hand, he is then somehow in control of this sound sequence. The disabled child becomes aware of this sound sequence and can use it in his communication. Additionally, drilling and repetition are necessary when working with dyslexic children. However, if teachers are going to repeat something over and over to the child for him/her to learn it, then it has to be presented in many different forms. Teachers have to make it as interesting as possible for the disabled child to want to learn and be involved. This can be accomplished by involving the child's oral, visual and kinesthetic senses. Children learn by doing, not by watching. This is especially true of children who have learning problems, specifically a learning disability.

## Chapter Two: Learning Disabilities

Lerner (1997) notes that learning disabilities are recognized among educators and parents, but are still not fully understood. In this chapter, I will present several definitions of learning disabilities, and then discuss the types and causes of these disabilities. I believe there is a need to focus on learning disabilities because it is essential to understand these disorders in order to explain the symptoms many children, in our classrooms manifest. It is important for all teachers to be familiar with LDs because at one point or another in their careers, they are bound to come across a student with a learning disability. I think teachers need to recognize that learning disabilities are real. A person can be of average or above-average intelligence and still struggle to keep up with others of the same age in learning and regular functioning because of an LD. Lerner (1997) believes that it is essential to realize that learning disabilities do not only concern the education field, it is an interdisciplinary field, which involves education, psychology, medicine and language.

Palombo (2001) notes that the term learning disabilities is used by “educators, educational psychologists, and neurophysiologists” (p. 16) when they are assessing children who have academic problems and need to be placed in special education programs. School teachers should be aware of the signs of LDs in order to detect cases in the classrooms. This is important because the earlier a learning disability is detected; the better chance a child has of succeeding in school and later in his/her adult life.

Learning disabilities are universal. They occur in all cultures, countries, and language groups. These difficulties may be mild, moderate or severe. Learning disabilities can also be specific, like when a child experiences problems with a particular

task such as reading, or they can be general, like when a child faces learning problems across a range of tasks (Lerner, 1997).

#### A. Definitions:

What exactly are learning disabilities? There is no easy answer for this question. Forming a single definition for learning disabilities has proven to be challenging; however, a number of acceptable and agreeable definitions have been generated and used over the years. Four major definitions will be referred to:

- The National Information Center for Children and Youth with Disability

(NICHY) (April 2002) gives the following definition:

“Learning disability is a general term that describes specific kinds of learning problems. A learning disability can cause a person to have trouble learning and using certain skills. The skills most often affected are: reading, writing, listening, reasoning, and doing math” ([www.ldonline.org](http://www.ldonline.org)).

- The following definition first appeared in 1975 in Public Law 94-142 in the United States, Education for All Handicapped Children Act, and then was revised in the 1990’s version of the Individuals with Disabilities Education Act (IDEA) (PL 101 – 476). It states:

“The term ‘specific learning disability’ means those children who have a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include a learning problem which is primarily the result of visual, hearing, or motor handicaps, or mental retardation, or emotional disturbances, or of environmental, cultural, or economic disadvantage” (Lerner, 1997, p.9).



- The National Joint Committee on Learning Disabilities gave the following definition in 1994:

“Learning disabilities is a general term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual and presumed to be due to central nervous system dysfunction. Problems in self-regulatory behaviors, social perception, and social interaction may exist with learning disabilities but do not by themselves constitute a learning disability. Even though a learning disability may occur concomitantly with other handicapping conditions (for example, sensory impairment, mental retardation, social and emotional disturbance) or environmental influences (such as cultural differences, insufficient/inappropriate instruction, psychogenic factors), it is not the result of those conditions or influences” (Lerner, 1997, p. 10).

Keogh (1994) in Lerner (1997) stresses the need for several definitions of learning disabilities. These definitions are necessary for various populations, ages, professionals, and degrees of severity. Moreover, different types of learning disabilities have different characteristics, which cannot all be listed under one single definition.

Despite the existence of all the various definitions, they all have several common elements. Lerner (1997) lists and examines these as:

1. Central nervous system dysfunction - since all learning takes place in the brain, then a disorder in learning can be caused by a dysfunction in the central nervous system. Many of the definitions imply that learning disabilities are related to neurological factors. Since in many cases the neurological condition is impossible to determine through medical test, dysfunction of the central nervous system is therefore determined through observation of behavior.
2. Uneven growth pattern – this refers to an “uneven development of the various components of mental ability” (p.13). Intellect, or mental ability, is composed of many sub-abilities and not just a single capacity. In the case of a person with

learning disabilities, these sub-abilities do not develop in a normal fashion, meaning that while some abilities develop at an even rate, others lag behind, thereby appearing as symptoms of learning disabilities.

3. Difficulty in academic and learning tasks – different people with learning disabilities have different types of problems in learning. While some may struggle with acquiring speech and oral language, others may have problems with math, reading, handwriting, motor skills, thinking or psychological skills.
4. Discrepancy between potential and achievement – the definitions state that an individual with learning disabilities has a discrepancy between his/her potential and achievement in one or more areas. This means that there is a gap between what this person is potentially capable of doing and what s/he can actually achieve, given the environment or educational setting s/he is in.

#### B. Signs:

For many individuals, a learning disability is a lifelong problem. There is no one sign that shows a person has a learning disability, so how can it be determined if a child has a learning disability or not?

Dockrell and McShane (1995) say that to identify a learning disability, an assessment must be carried out. Based on the results, a treatment program may be set up and implemented. To better understand learning disabilities, they suggest a three-part framework: the task, the child, and the environment. Analyzing each of the three parts helps in dealing with learning disabilities. The task(s) with which the child has difficulties must be analyzed so that each component skill for successful performance is understood. Second, the child is the one who is obviously having problems, so it is

necessary to assess him/her for signs of LD. Finally, the environment plays a big role in contributing to the child's difficulty. A child with learning disabilities is generally more dependent on his environment than a normal child.

According to NICHY (2002), if a person shows a number of the following problems, then s/he is considered to have a learning disability, keeping in mind the different types of LD. A child may have trouble learning the alphabet and connecting letters to their sounds. S/he may also make many mistakes when reading in addition to not understanding what s/he reads. Moreover, the person may have trouble spelling, may struggle to express his/her ideas in writing, and may mispronounce words or use a wrong word that sounds similar.

When testing a child to determine if s/he has an LD, various academic skills must be looked at. The child's ability to "listen, speak, read, write, do mathematics, and reason" (Bergert, 2000, p. 18) must be closely examined. A child who is diagnosed with LDs may have problems with listening – s/he is not able to discriminate between similar sounds or may have problems with speaking, or reading, or writing, or may have problems with mathematics – s/he is unable to solve problems with multiplications or divisions, or finally reasoning (Palombo, 2001).

Many different characteristics are associated with learning disabilities; however, each individual is unique and may exhibit only some of these characteristics. For example, a student may have great difficulty with math, while another might excel at math. Moreover, certain kinds of characteristics may be clearly present at specific age levels. During assessment, the assessor determines which characteristics are present and how they affect the individual's learning.

### C. Causes:

In its executive summary of the year 2001, the National Research Council of the National Center for Learning Disabilities in the United States claims that experts are not sure concerning the exact causes of LDs. However, they maintain that LDs may be due to:

- Heredity – LDs often run in the family
- Problems during pregnancy – such as illness or injury, drug or alcohol use, low birth weight, lack of oxygen, premature or prolonged labor.
- Incidents after birth – head injuries, nutritional deprivation, or exposure to toxic substances

Despite the absence of a single apparent cause for LDs, the Council clearly clarifies that LDs are not caused by economic disadvantage, environmental factors or cultural differences. It implies that they are purely biological.

According to Dockrell and McShane (1995), learning disabilities occur for different reasons. The first and most important reason is that some children have “inherent cognitive” (p. 9) difficulties that make learning a specific skill extremely challenging. Another reason is that some difficulties are the result of educational or environmental problems, not related to cognitive abilities. Such factors can be ineffective teaching strategies lack of self-confidence, early scholastic failure, home situations, and others. These external factors affect the child’s performance and level of achievement. It is worth noting here that there must be a distinction between learning difficulties and learning disabilities in Dockrell and McShane’s (1995) explanation of causes. I believe that difficulties can be done away with, if a child has learning difficulties due to external

factors, then these factors can be solved or eliminated. Once this is done, the child then can be free of his/her learning difficulties. In contrast, learning disabilities are not curable. Once a child has a learning disability, it is a lifetime problem. They cannot be eliminated; however, they can be treated and the child can learn to cope with his/her disability.

#### D. Types:

Learning disabilities are usually divided into four main categories. The 23<sup>rd</sup> annual report of the US Department of Education to Congress on learning disabilities (2001) lists the following as the four major categories of learning disabilities:

1. Dyslexia – The area of difficulty is processing language and the symptoms include trouble with reading, writing, and spelling.
2. Dyscalculia – The area of difficulty is math skills and the symptoms include trouble with computation, remembering math facts, and concepts of time and money.
3. Dysgraphia – The area of difficulty is written expression and the symptoms include trouble with handwriting, spelling, and composition.
4. Dyspraxia – The area of difficulty is fine motor skills and the symptoms include trouble with coordination, and manual dexterity.

The American National Institute of Health (1993) also divides learning disabilities into categories:

#### A. Academic Skills Disorders:

1. Developmental Reading Disorder – person is unable to distinguish the sounds in spoken words. Person has trouble sounding out words. Person has problems with rhyming and comprehension.

2. Developmental Writing Disorder – person is unable to compose complete, grammatical sentences. Person has trouble with vocabulary, grammar, handwriting, and memory.

3. Developmental Arithmetic Disorder – person has problems with numbers or basic concepts. Person has trouble in reasoning.

#### B. Other Learning Disorders:

1. Motor Skills Disorders

2. Coordination Disorders – these can lead to poor handwriting, spelling and memory disorders.

Over the years, many terms have been coined to refer to dyslexia, such as specific dyslexia, minimal brain dysfunction, and minimal cerebral damage. Other labels have referred to specific designations of dyslexia: agraphia and dysgraphia – disorders in handwriting, agnosia and dysgnosia – disorders in remembering specific language factors, and acalculia and dyscalculia – disorders in mathematics (Jordan, 1977). A full discussion of dyslexia will be presented in chapter three of this research.

Concerning dysgraphia, Lerner (1997) declares that writing “requires many related abilities, including facility in spoken language, the ability to read, skills in spelling, legible handwriting, or skills with computer keyboarding, knowledge of the rules of written usage, and cognitive strategies for organizing and planning the writing” (pp. 455-58). People with LDs lack many of these critical abilities and this leads them to poor skills in written communication and sharing thoughts.

As for dyscalculia, Dockrell and McShane (1995) believe that children, in general, have a natural readiness for numbers. However, while most children can easily

learn how to count and solve basic mathematical problems, others do not. These children struggle with arithmetic, fall behind their peers, and sometimes never grasp the mathematical skills necessary for everyday life. Additionally, dyscalculia is related to other learning disabilities; “number difficulties often occur in the context of reading difficulties, but they can also occur independently of reading difficulties” (p. 123). Even though number problems are quite prevalent among school children, there is not much research attention focused on them. Mathematical disabilities have not received as much attention as reading / writing disabilities. This may be due to the fact that some students who have severe reading disability do well in math. While it is true that each student is unique, there are a number of characteristics of math LDs that affect “quantitative learning, such as problems in special relationships, visual perception, symbol recognition, language and communicative abilities, memory, graphomotor skills and cognitive strategies” (Lerner, 1997, p.497).

#### E. Teaching Strategies:

There are a number of teaching strategies that educators and teachers can follow in their treatment of children with learning disabilities. There are many general actions school teachers can take in their classes to help students with learning disabilities. The National Information Center for Children and Youth with Disabilities (NICHD) Fact Sheet #7 (2002) states that teachers can break tasks into small steps, give directions verbally, and in written form, give students with learning disabilities more time to finish their work, and let students with writing problems to use a computer with specialized software. Moreover, teachers are advised to take the time to learn about the different types of learning disabilities and how they can modify their exercises and tests to suit

their students' organizational skills, study skills and learning strategies in addition to helping them develop self-understanding and gain the confidence necessary to cope with their learning disabilities.

Finally, several disciplines participate in the study of learning disabilities, making it an interdisciplinary field. These disciplines are education, psychology, language, medicine, and other professions (see Appendix A). According to Lerner (1997), each specialization has important contributions to make to the field. The contributions of education are the most practical. Educators are the ones who deal with the reality of teaching students with learning disabilities. They need to be knowledgeable of the materials, methods, and subject areas as well as the learning situation.

Psychologists also have a significant impact on this field, especially specialists in child development, cognitive psychology and school psychology. School psychologists are the ones who observe, evaluate and characterize the behavior of children in schools. Psychologists have enriched the field with their analyses and contributions of theories and teaching implications (Lerner, 1997).

Thirdly, professionals in the fields of speech and language pathology, language development, linguistics, and psycholinguistics are extremely valuable to the study of learning disabilities. Concepts in psycholinguistics and language development have increased the understanding and knowledge of children with learning disabilities; knowing how a normal child learns language is crucial when diagnosing and treating children with learning disabilities (Lerner, 1997).

Lerner (1997) also discusses the medical field, in both its practitioners and researchers, which has also added to the study of learning disabilities. School nurses are



one of the key elements in this field. Medical specialists view learning disabilities pathologically and therefore have contributed to identifying the causes of learning disabilities as well as remarkable discoveries about the brain and learning. Finally along with the above-mentioned fields, many other professionals also play important roles in dealing with learning disabilities. These are optometrists, audiologists, social workers, occupational therapists, guidance counselors and others. Additionally, parents are vital contributors because they know the children the best. The parents' help, support and input are necessary to better understand children with learning disabilities.

In conclusion, learning disabilities are disorders that affect the ability to understand or use spoken or written language, do mathematical calculations, coordinate movements, or direct attention. Such difficulties sometimes have clear biological causes like a hearing, speech, or visual impairment; other times the causes are more difficult to explain. Although learning disabilities occur in very young children, the disorders are usually not recognized until the child reaches school age. There are children who have difficulties in reading, writing, and spelling worldwide. Learning disabilities are lifelong conditions. In some people, several overlapping learning disabilities may be apparent, one of which is the focus of the next chapter, dyslexia.

## Chapter Three: Dyslexia

For many years, educators have observed a mysterious dilemma in the classroom. Certain intelligent children never learn to read, write, spell or do math at their grade level, no matter what methods their teachers use. Many of these children are identified as dyslexic. This chapter will discuss dyslexia with its definition, types and causes. Moreover, several teaching methods, which are followed in dyslexic classrooms, will be presented and discussed.

Dyslexia is a disorder that affects millions of people all over the world. It is one type of brain-based type of learning disability that specifically impairs a person's ability to read. The word dyslexia comes from Greek: 'dys' meaning difficulty and 'lexis' meaning words. Thus, dyslexia is a difficulty with words. Dyslexics learn at their own level and pace, and typically excel in one or more other areas. They read at levels significantly lower than expected despite having normal intelligence. The dyslexics' experiences include difficulties with concentration, perception, memory, verbal skills, abstract reasoning, hand-eye coordination, social adjustment, poor grades and underachievement. Often, people with dyslexia are considered to be lazy, rebellious, class clowns, or of low intelligence. These misconceptions, without understanding dyslexia's effect on the person's whole life, lead to rejection, isolation, feelings of inferiority, discouragement, and low self-esteem (Osmond, 1994).

### A. Definition:

Many professionals have attempted to define dyslexia, and great differences exist among the various definitions in the field. There is no such thing as a typical dyslexic. The dyslexic symptoms can sometimes be found in people who are just poor readers.

Thus, making a clear diagnosis based on the existence of certain signs and symptoms is not always easy for practitioners to make. To better understand dyslexia, Elliot and Place (1998, p. 193) refer to the 1994 Orton Dyslexia Society's definition of the disorder as: "...one type of several distinct learning disabilities. It is a specific language-based disorder of the constitutional origin characterized by difficulties in single word decoding, usually reflecting insufficient phonological processing abilities. These difficulties in single word decoding are often unexpected in relation to age and other cognitive and academic abilities; they are not the result of generalized developmental disability or sensory impairment. Dyslexia is manifested by variable difficulty with different forms of language, often including, in addition to problems reading, a conspicuous problem with acquiring proficiency in writing and spelling."

Nowadays, the term dyslexia seems to be the most satisfactory or acceptable among professionals who treat language disorders. There are two major views to the causes of dyslexia, the medical view and the educational view. On the one hand, medical professionals insist that dyslexia is caused by a physical disability. Brain damage is attributed as the cause of dyslexic sets of behavior. Brain damage means that brain tissue has been destroyed or that certain brain systems only function partially. As a result, medication is often prescribed to calm nervousness or hyperactivity in dyslexic children (Jordan, 1977). Additionally, Snowling (1996) examines these two approaches to dyslexia hoping to arrive at an acceptable view of this learning disability. She explains that in the past, reports of word blindness in children emanating from the medical field have led to the belief that dyslexia is a syndrome with associated signs. In 1970,

Critchley insisted that dyslexia was a medical responsibility and therefore must be diagnosed as a medical problem.

Two sets of features have been emphasized when setting guidelines for diagnosis: those concerned with the cognitive characteristics of dyslexics and those pertaining to their reading and spelling behaviors. Snowling (1996) says that dyslexia has been associated with the following physical problems:

- Slow speech development
- Speech and language difficulties
- Delays in motor development
- Visual deficits
- Perceptual deficits
- Sequencing problems
- Problems with temporal & spatial awareness

Moreover, Critchley & Critchley (1978) in Snowling (1996) say that many children with dyslexia have “inconsistent or mixed cerebral dominance” (p. 2). This means that even if a child is right-handed, s/he could be left-eyed or vice versa.

On the other hand, the second major view supported by researchers and educators is that dyslexia is not a matter of brain injury; it is the result of underdeveloped learning centers in the brain. This view insists that dyslexia can be corrected by treating specific skills, such as phonics, handwriting and spelling (Jordan, 1977). Furthermore, Snowling (1996) argues that while the medical checklist for diagnosing dyslexia is clear, she questions the number of symptoms necessary for a diagnosis. She insists that data concerning dyslexia cannot be normative because of the individual differences in

language development and the insufficient information about the development of sequencing skills, the appreciation of time or the sense of direction in children, which makes this view of dyslexia less credible than the first.

There is an additional view of dyslexia which falls between the two extremes. Educators who are undecided about either opinion are concerned mainly with identifying the disability, deciding on appropriate teaching procedures, and teaching dyslexics to function in language situations (Jordan, 1977). It is the purpose of this study to adopt this view of dealing with dyslexia in an attempt to question the methodologies being applied in the school in the Metn that was observed. It is my belief that following a multisensory approach as a teaching method would improve the academic performance of fourth grade dyslexic English students as opposed to the performance of other students who are not exposed to multisensory methods.

#### B. Causes:

Lerner (1997) says that dyslexia has “puzzled the educational and medical communities for many years” (p. 397). She claims that despite the different definitions and explanations of dyslexia, there is a general agreement on four points to be considered as causes:

1. Dyslexia is most likely caused by a congenital neurological condition.
2. Dyslexia persists into adulthood.
3. Dyslexia has perceptual, cognitive and language dimensions.
4. Dyslexia leads to difficulties in managing life in terms of daily activities as the person matures.

As with the causes of dyslexia, there are also many types that can be identified.

### C. Types:

Regardless of the causes, dyslexia is widely present in everyday classroom situations. The immediate concern for teachers is what can be done to help dyslexic children become independent, literate individuals. As dyslexia is seen as a continuum, no two children exhibit identical symptoms. Dyslexia can be labeled as visual dyslexia, auditory dyslexia, and dysgraphia. The following section of this chapter will discuss these three kinds of dyslexia which are often present simultaneously in a child, thus affecting more than one area of learning. Children rarely have one form of dyslexia, so the three types must be acknowledged in relation to one another.

#### 1. Visual Dyslexia:

The first and most common type of dyslexia is visual dyslexia. Jordan (1977) defines visual dyslexia as “the inability to translate printed language symbols into meaning” (p. 4). This means that visual dyslexia is not about poor eyesight, but rather about correctly interpreting what is seen. Children with visual dyslexia see letters upside down and backwards. They also have a problem with seeing whole parts of words in reverse, not only letters.

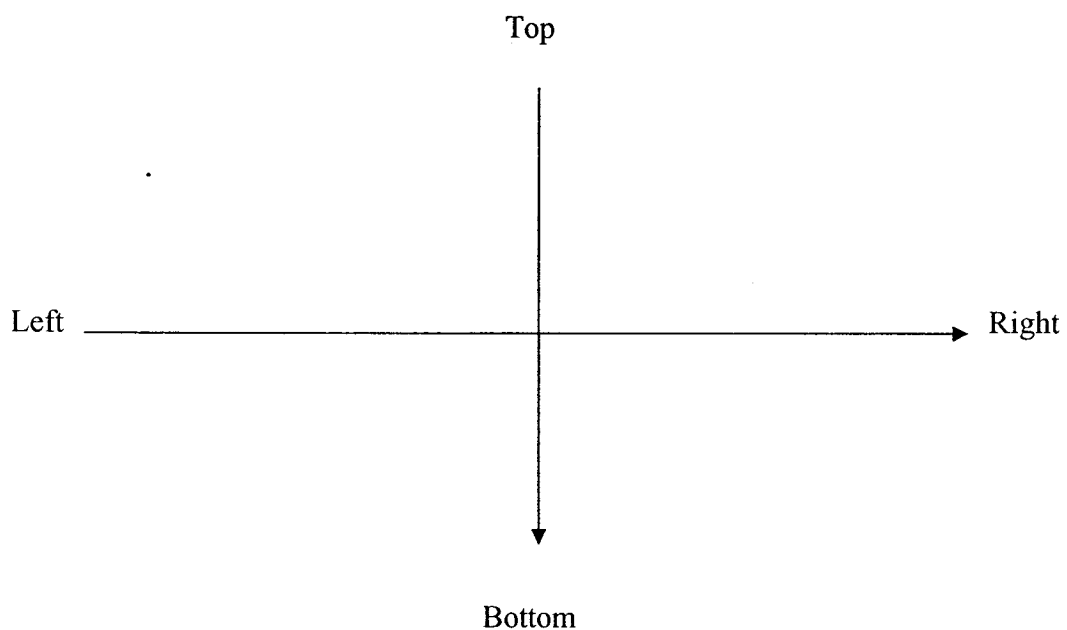
Visual dyslexics have to work very slowly because of their scrambled perceptions. However, teacher demands for speed in writing and reading do not consider the slowness of visual dyslexics, who are not capable of speed. The visual dyslexics also have problems with arithmetic. Adding, subtracting, multiplying and dividing all require changes in direction, which the student is not capable of following. As a matter of fact, visual dyslexics have severe trouble handling any situation which requires them to comprehend sequence. They cannot recall the order of the days of the week, months of

the year, multiplication tables, and so on. They also forget to do habitual chores or follow instructions. This forgetfulness is not due to laziness but to a problem in perceptive serial relationships (Jordan 1977).

Lerner (1997) explains that most teachers can understand why visual dyslexics have trouble with reading, as reading is an extremely difficult process. She refers to a study by Anderson, Hiebert, Scott & Wilkinson (1985) which identifies five generalizations that define skillful readers. In contrast, dyslexics are poor readers who are not able to fit into any of the five generalizations. First good readers must be fluent in reading. They must be able to identify word easily and fast. Dyslexics cannot recognize words easily and quickly. Second, reading must be looked at as a constructive process. Readers have to build meaning in a text based on their previous knowledge and experience. In a way, they are constructing their own meaning of a text by creating “their own mental version of what they read” (p. 400). Dyslexics are not able to construct their own meanings for texts. The third generalization is that reading requires strategy. Good readers are able to “change and direct their reading style” (p. 401) to suit their purposes and the type of text they are working with. Dyslexics find it difficult to follow strategies to monitor their own comprehension. Additionally, skillful readers are highly motivated. Learning to read is a long process which takes a long time and readers must not lose their motivation. Last but not least, poor readers have low motivation; they become discouraged and give up easily. Fifth and finally, the skill of reading is constantly developing. As readers practice, they will improve in their reading. This does not apply to dyslexics because they do not develop at the rate others do or in the same manner.

The major flaw in visual dyslexia is the child's inability to understand and accurately follow order or sequence. However, it must be noted that all children exhibit flawed perception at various stages of growth. So before making any diagnosis of visual dyslexia, the assessor must be fully aware of all the unmistakable symptoms present (Jordan, 1977).

Jordan (1977) explains that most school work follows a standard model:



When reading, students must follow left to right from top to bottom. This framework is often taken for granted in most classrooms; teachers assume that any child who can read will follow this principle. However, this is not the case with the visual dyslexics. The dyslexics' orientation is a mirror image; this means the students will process symbols backwards from right to left and bottom to top. Dyslexic children have problems

- perceiving the following symbols correctly:
  - d-b-p-q
  - M-W



- u-n
- 7-L
- 6-9
- h-y

When a teacher introduces the letter *d*, s/he assumes that the students will perceive it from left to right and top to bottom. This is not true for children with visual dyslexia, whose perception of orientation is completely different. They may process the letter *d* as a *p*, *b*, or *q*. Sometimes dyslexics only rotate part of the symbol and so they confuse:

- N-Z
- 3-M-W (Jordan, 1977)

Reading involves word-recognition skills and reading comprehension. Students have to recognize the words in order to understand what they read, so both parts are essential for becoming readers. Word-recognition is important because it enables students to focus on the meaning of the printed text. When readers struggle to identify words, they have little energy left for comprehension. Without strong word-recognition skills, reading can never be mastered. Moreover, reading comprehension is equally important; it is the readers' ability to find meaning in the printed words. It is a deficiency for many students with learning disabilities. Reading comprehension skills do not develop automatically after word-recognition skills. In fact, many dyslexic students who eventually learn to cope with word-recognition may continue to have serious problems and difficulties with reading comprehension tasks. In such cases, teachers need to supply these learners with strategies to help them understand printed texts actively (Lerner, 1997).

In class, the teacher should be able to identify confusion from laziness. Jordan (1977) believes that an alert teacher can tell if the student is having problems with tasks involving sequential order since the student is often not capable of communicating his/her confusion because s/he finds it difficult and confusing to do so. Teachers need to pay close attention to their students' performance to identify any trouble the students may be experiencing. This faulty perception of sequence is why visual dyslexics have inferior comprehension skills. They are unable to conserve the form of letters in the order they see them. They cannot remember forms because they have very short-term memory. This handicap of conservation poses a major problem for the visual dyslexics when trying to cope with the alphabet. Children with normal perception usually learn the sequence of the alphabet successfully, but visual dyslexics will mix capital and lower case letters, printed and cursive writing, and the order of the order of the letters.

The following example from Jordan (1977, p. 22) highlights tendencies of the visual dyslexics. For other examples, see Appendix B.

Figure 1. Sample of a Visual Dyslexic's Work

1. dig	<i>diz</i>	14. pig	<i>piz</i>	27. big	<i>big</i>
2. ate	<i>eat</i>	15. made	<i>rade</i>	28. goes	<i>goos</i>
3. play	<i>play</i>	16. please	<i>plis</i>	29. men	<i>me</i>
4. duck	<i>duck</i>	17. back	<i>back</i>	30. truck	<i>truck</i>
5. party	<i>party</i>	18. pretty	<i>proy</i>	31. try	<i>try</i>
6. brown	<i>drawn</i>	19. born	<i>born</i>	32. for	<i>for</i>
7. bare	<i>bone</i>	20. brand	<i>brand</i>	33. from	<i>from</i>
8. girl	<i>girl</i>	21. bad	<i>bad</i>	34. stop	<i>stop</i>
9. saw	<i>saw</i>	22. was	<i>was</i>	35. post	<i>post</i>
10. kind	<i>kind</i>	23. king	<i>king</i>	36. sat	<i>sat</i>
11. city	<i>city</i>	24. sent	<i>sent</i>	37. salt	<i>slat</i>
12. this	<i>this</i>	25. think	<i>think</i>	38. how	<i>how</i>
13. on	<i>on</i>	26. no	<i>no</i>	39. who	<i>who</i>

Visual dyslexics have a tendency to reverse symbols in reading printed material. They are confused as to the direction of certain letters. This handicapping tendency to reverse or rotate symbols is illustrated in the following specimen taken from Jordan (1977, p. 25).

Figure 2. Sample of Symbol Reversal

Jim      Age: 7 years, 6 months  
Grade: 2.8  
IQ: 113 WISC

A a B d c c b E e f g h i J K L n m o p Q  
S t u v x y x

Jordan (1977) recommends that teachers observe for the following errors to determine the presence of any dyslexic patterns in their students' work:

- Reversal of beginning letters – dump for bump
- Transposition of blends and digraphs – there for three
- Substitution of one similar letter for another – sleep for sheep
- Reversal of whole words – on for no
- Failure to perceive minimal cues – house for horse
- Omission of endings – ever for every
- Telescoping – sudly for suddenly
- Perseveration – hopenen for hope

Some of these tendencies can be observed later in the samples of the students' work from the Learning Support Program in the school which was observed.

Moreover, teachers can watch for tendencies of visual dyslexia in students' copying and spelling. When copying a paragraph from the chalkboard, teachers should look out for some common errors. Dyslexics tend to lose their place on the chart, erase frequently, and overprint to correct mistakes on paper, misspell, fail to observe capital letters, and fail to observe punctuation cues. They also fail to space properly, reverse letters, reverse whole words, and work unusually slowly. The following errors exhibit visual dyslexia in spelling from memory. Students make mistakes in failing to observe capital letters, omitting letters, reversing letters, transposing letters, and adding letters (Jordan, 1977 p. 28):

Table 1. Visual Dyslexic Spelling Errors

<i>Words in Student's Mind</i>	<i>Written Response</i>
rode	Roed
ate	act
goes	gose
heaven	haven
marriage	mirarage

Jordan (1977) advises teachers to not make any quick judgment before “a definite syndrome of dyslexic behavior has been identified in a pupil’s behavior” (p.25). He has devised a checklist for identifying visual dyslexia (see Appendix C). The criteria for visual dyslexia include symptoms such as confusion with sequence. For instance, the dyslexic may have a poor concept of time, or cannot repeat days of the week or months of the year. Additional symptoms include difficulty following directions, in class and/or at home, and faulty oral language and reading comprehension. The dyslexic is not able to tell story events in the correct sequence, cannot identify main ideas in a story, and has difficulty inferring meaning from what has been read. Moreover, visual dyslexics work at a much slower pace than their classmates, and have frequent errors in spelling and copying. Since a person rarely has just one clear-cut type of dyslexia, many of the characteristics of one type usually overlap with others. This is the case with visual dyslexia and the second type of dyslexia, auditory dyslexia

## 2. Auditory Dyslexia:

The second form of dyslexia is auditory dyslexia, according to Jordan (1977). As it is, a 'normal' child who suffers from physical hearing problems has a low concentration span because s/he does not hear (Pollock & Waller, 1994). Auditory dyslexia has nothing to do with hearing ability, but rather it is the inability to perceive the separate sounds of spoken language. The dyslexics cannot identify differences between vowel sounds and consonant sounds; therefore they cannot link specific sounds with printed forms. As a result, auditory dyslexics are poor in spelling and composition. They have a strong need for repetition because they are never really sure of what they hear. Auditory dyslexics can comprehend only about 30% of what they hear the first time, resulting in their inability to score well on standardized tests (Jordan, 1977).

Additionally, the auditory dyslexics perform poorly in "rhyming words, interpreting diacritical markings, applying phonic generalizations, and pronouncing words accurately" (Jordan, 1977, p. 28). For instance, a child is not able to tell the difference between 'beg' and 'big' because he/she does not perceive differences in vowel sounds, unless the words are heard in context. This excludes children who are late speakers and simply take longer than others to acquire this skill.

Jordan (1977) emphasizes that when diagnosing this disability, the teacher must look for the students who cannot match oral language to written form. Auditory dyslexics will fail to recognize that some written forms represent words they use fluently in daily speech, so they will fail at reading these forms. Auditory dyslexics have problems with consonant clusters. They are unable to identify the consonants in clusters such as 'st', 'sp', 'gr', or 'pl'.

Auditory dyslexics cannot tell whether words are the same or different. For instance, a child who is handicapped by auditory dyslexia may not be able to tell the difference between 'bed' and 'dead'. Also, auditory dyslexics are also extremely poor spellers because they have no dependable way to remember how to spell. Some students devise mnemonic systems to help them remember but these are not very effective as the vocabulary of the students grow (Jordan, 1977).

Gilroy & Miles (1996) state that auditory dyslexics put words and syllables in the incorrect order when they speak. They also have problems remembering aural instructions and/or understanding printed texts which are presented orally/aurally. In addition, auditory dyslexics are more likely than other learners to mispronounce certain words.

When diagnosing auditory dyslexia, Jordan (1977) offers classroom teachers four basic patterns of errors to follow:

- Transposed Consonant Elements – dyslexic students often transpose consonant patterns; 'girl' becomes 'gril'. They do not associate sound patterns with their written form so they cannot recognize the transpositions.
- Phonetic Spellings – dyslexic students cannot apply phonetic generalizations to their spelling. They actually write with literal translations, and so the teachers have to check if the students' writing can be read phonetically. For instance, they would write 'refeews' for 'refuse'.
- Sound Units Omitted – dyslexics leave out sound units from multi-syllable words.

The following Table 2 shows examples of this tendency (Jordan, 1977, p. 29):

Table 2. Auditory Dyslexic's Error Samples of Omitting Sound Units

<u>Dictated by Teacher</u>	<u>Student's Written Response</u>
remember	Rember
tuberculosis	Torberkulous
indefinitely	Endefinely

- Sound Units Added – dyslexics tend to add sound units to words. This is also called perseveration. Consider the following examples from Jordan (1977, p. 29) which clearly exhibits the tendency to add sound units to words.

Table 3. Auditory Dyslexic's Error Samples of Adding Sound Units

<u>Dictated by Teacher</u>	<u>Student's Written Response</u>
duck	Dukey
pretty	Patting
party	Paturing
doll	Dalken

Teachers can also give a spelling test of words that are commonly misspelled by dyslexics. The following dictation test in Table 4 is taken from Jordan (1977, p.40) to illustrate students' confusion and dyslexic tendencies.

Table 4. Common Dyslexic Spelling Mistakes

Dictated by Teacher ✓

bad

bag

ball

bed

bell

Dyslexic Responses ✓

Ba@d

Ba@

Ball

Be@d

Bell



Another earmark of auditory dyslexia is the difficulty to rhyme. Jordan (1977) says that many teachers, in elementary school classes, focus on rhyming words as a way to bring certain phonic aspects to the pupils' attention. Children with auditory dyslexia have major problems understanding the similarities and differences in word elements; thus they fail in reproducing rhymes. When working with rhymes, it is imperative to remember that some students can do oral rhyming activities accurately but not so in written form. So, the teacher has to use both oral and written activities when determining the extent of the learning disability.

Auditory dyslexics also have a problem with pronunciation. As they are unable to blend sounds, they produce scrambled pronunciation. Teachers can devise lists of words for the children to repeat when trying to identify auditory dyslexia. The following samples in Table 5 are taken from Jordan (1977, p. 46) to illustrate the deviance in pronunciation.

Table 5. Auditory Dyslexic Sample of Pronunciation Errors

<u>Normal Pronunciation</u>	<u>Auditory Dyslexic Pronunciation</u>
aluminum	Aluminum
vinegar	Vigenar
animals	Aminals
olive	Olly
spaghetti	Pasghetti

Teachers can also try working with tongue twisters, emphasizing on the child having fun and not being worried about their pronunciations. Students enjoy tongue twisters such as 'apples in cinnamon', 'alum in vinegar', or 'baskets of olives'.

Finally, keeping in mind the danger of attaching wrong labels to students' learning disabilities, Jordan has devised a checklist for identifying auditory dyslexia symptoms (see Appendix D). Auditory dyslexics exhibit confusion with phonics. They cannot distinguish differences in vowel sounds and/or consonant sounds. They confuse words and spelling. They are not able to tell when words are alike or different and tend to spell phonetically. Finally, since auditory dyslexics require reinforcement while writing and reading, they usually whisper while writing or reading silently. Auditory dyslexics cannot be isolated into a single category, as they exhibit many of the signs of visual dyslexics, they also show signs of the third type of dyslexia, dysgraphia.

### 3. Dysgraphia:

The third and final type of dyslexia is dysgraphia. It is defined as "the inability to coordinate hand and arm muscles to write legibly" (Jordan, 1977, p. 9). The dysgraphic student has a clear mental image of what he wants to encode, but finds himself forgetting how to write specific symbols, which results in his difficulty to practice legible handwriting. Students with dysgraphia are often the only ones who can read their own writing. It is difficult for them to learn to write legibly, so they usually learn to type as a substitute for handwriting.

Lerner (1997) asserts that writing is usually the last skill to be learned because it is the most complex. In general, students with learning disabilities face major problems with writing because they are not able to clearly express their thoughts in words and

sentences. They often lack the necessary organizational skills to produce written work. Also, some dysgraphics have weak visual memories, which allow them to neither recall shapes nor to "integrate complex eye-hand relationships" (p. 455). As writing is required across all subjects of the educational curriculum, students with dysgraphia face severe problems in all situations that require them to communicate through writing. These individuals' written output is usually characterized by numerous spelling, grammar, punctuation, and handwriting errors. Dysgraphics clearly exhibit an inability to produce long, well-organized, and well-developed written work. Moreover, students with dysgraphia tend to transpose letters or syllables in words. They also sometimes omit whole words or parts of words. They have difficulty with penmanship, which sometimes leads others, including teachers, to label these learners as lazy (Gilroy & Miles, 1996).

Teachers need to distinguish between dysgraphia and careless handwriting habits. There are specific characteristics that distinguish dysgraphia from careless handwriting. First and most importantly, students have problems remembering how certain letters are formed. Dysgraphic children tend to write backwards, from right to left, whereas 'normal' children write cursively from left to right. As dysgraphic children become more familiar with the alphabet, their handicap gets more crippling. Second, dysgraphics have trouble with cursive letters that involve closed circular elements. For instance, pupils with dysgraphia cannot manage the letters *d, b, a, p, q, f, g, e,* and *o*. They also have great difficulty with letters involving a change in the direction of the hand movement like in the letters *c, h, j, t* and *z*. Children with dysgraphia cannot cope with where and how they must stop the circular motion in order to move correctly into the next letter when writing (Jordan, 1977).

A dysgraphic child's attempt to write the alphabet from memory shows his/her confusion between cursive and manuscript style. The child may mix both styles in his/her writing and have problems forming loops on some letters. The teacher in such a situation must watch the child at work. Then, s/he must re-create the pupil's writing style by carefully tracing over the handwriting in order to identify the problems in direction and to find out where the child's writing cut off point is (see Appendices E & F).

As dysgraphia is called 'mirror writing', most often dysgraphics' writing can be read when held up to a mirror. Sometimes the whole word is written backwards, other times only parts of words. Some students even exhibit 'mirror reading', which is when a child reads whole words from right to left. For instance, a dysgraphic will read 'saw' for 'was'. Below, Figure 3 is an example of a dysgraphic's mirror writing (Jordan 1977, p. 56) which shows how dysgraphics write whole words backwards as if they are seeing through a mirror.

Figure 3. Mirror Writing Sample

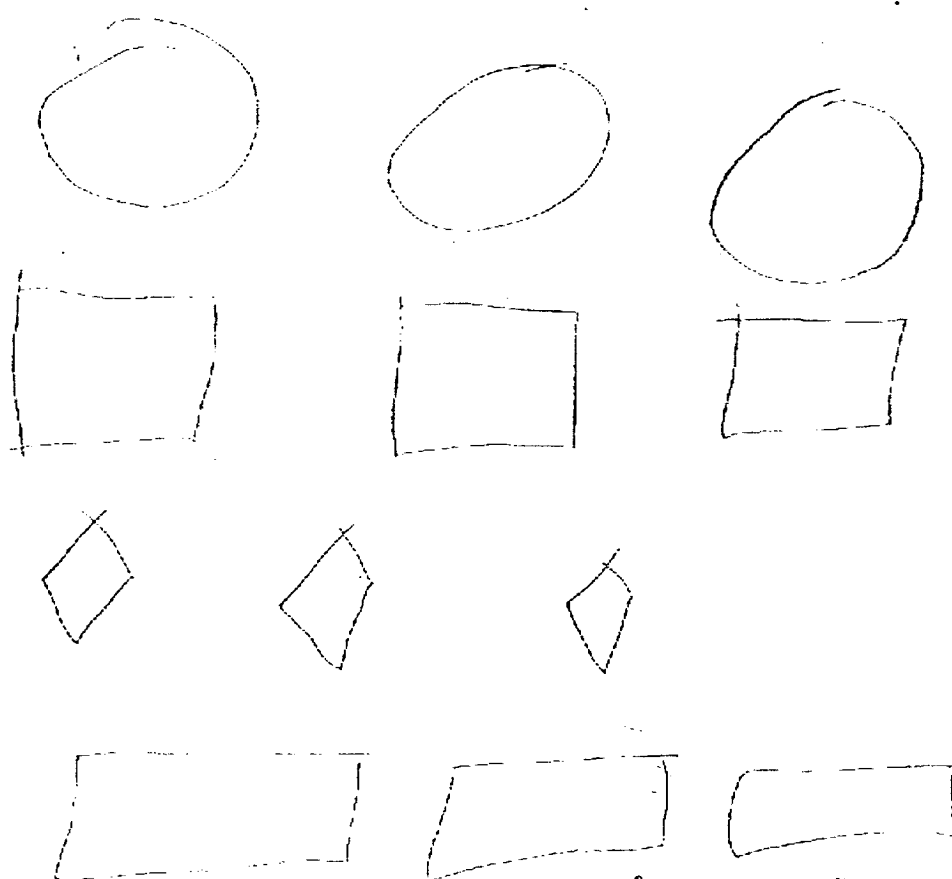
D dictated by Teacher

1. flag
2. hand
3. leg
4. nest
5. nut

q s s e n a v  
 g l a f 1  
 d n a n 2  
 g e l 3  
 t s e n r t  
 t e n r 5

Additionally Dysgraphics cannot cope with simple geometric shapes without distorting them. They are unable to copy circles, squares, diamonds, triangles or rectangles because they cannot conserve the shapes in their memories. Dysgraphics tend to draw 'ears' at the corners of simple figures as shown in the following example in Jordan (1977) of a copying activity (p. 63). It can be observed that the students do not close their circles properly and tend to draw lines to the edges of the geometric shapes.

Figure 4. Dysgraphic Sample of Geometric Shape Distortion



Another exercise teachers can use to identify dysgraphia is by giving the student a card with two sketches on it. The student studies the card for a short while, and then has to recreate both sketches from memory. Teachers look for dysgraphic tendencies of rotating from the horizontal plane and failing to notice minimal cues (see Appendix G).

Dysgraphia is characterized by symptoms such as having difficulty with alphabet or number symbols. Dysgraphics do not remember how to write certain letters or numbers, they tend to distort their shape. A second symptom is confusion with directionality. Some dysgraphics write in mirror reflection, they mark from bottom to top when writing certain letters, and/or use backward motions when forming loops. Furthermore, dysgraphics have trouble conserving form while copying simple shapes. For instance, they tend to distort simple shapes or have difficulty staying on lines when tracing. A checklist from Jordan (1977) is available to help teachers differentiate between careless writing and dysgraphia (see Appendix H).

In conclusion, dyslexia "involves a distinctive balance of skills" (Gilroy & Miles, 1996, p. 1). Dyslexics are talented in many fields such as art, engineering, computer programming, literature and drama. It is important for teachers to remember that people do not learn in the same way. When dealing with students with learning disabilities, especially dyslexia, classroom teachers must support their pupils by following specific strategies that can do much for the dyslexic students' confidence in class as well as for their academic development.

#### D. Teaching Methods:

Children with dyslexia need someone who will stand by them and encourage them. They do not need any teasing or judgment when things go badly for them in the classroom. Most importantly, they need someone who will actively believe in them by helping them overcome their dyslexia. If a child receives this support, he/she is likely to succeed in coping or overcoming his/her learning disability (Shaywitz, 2004).

There are various methods that can be followed in a remediation program. In the following section of this chapter, a few of the most effective strategies for teaching dyslexics to cope with their disabilities will be discussed. For any dyslexia remediation program to be effective, it must focus on different skills. First and foremost, systematic and direct instruction in phonemic awareness and phonics are necessary. The child should learn to identify and manipulate the sounds of spoken language. S/he must recognize how letters represent the sounds of spoken language, how to sound out words, to spell, to read, to follow reading comprehension strategies, and to keep up with new vocabulary. In addition, a good program must involve ample practice for the child to apply the reading and writing skills. Thirdly, oral fluency training is also essential, as well as enriched language experiences, which involve “listening to, talking about, and telling stories” (Shaywitz, 2004, p. 262). There are several teaching strategies and methods designed for improving word recognition, building fluency, and reading comprehension.

##### 1. Reading:

A child who is learning to read must first become aware of the sounds in language. Dyslexics experience difficulties doing this. Teachers can follow several methods to help them.

### i. Phonics Methods:

First, there are the Phonics methods. These are popular with most teachers and schools. Phonics programs have been around for many years and follow two approaches. Synthetic Phonics methods teach students isolated letters and their sound representations as a first step. Then, they teach students to blend these phonemes into words. Analytic Phonics methods teach students whole words that have consistent spelling patterns based on sound. At a later stage, students learn to analyze the separate phonemes that make up words. Dyslexic children need to understand that words are made up of small parts that can come apart. Once children become phonetically aware and can separate these parts, they will be confident enough to try and figure out how the printed letters link to the sounds (Shaywitz, 2004; Lerner, 1997).

### ii. Multisensory Methods:

Pollock & Waller (1994) divide reading into three stages of development. First, there is recognition and recall of the shapes of letters. The second stage is the ability to link these shapes to sounds and words. The final stage is investing these shapes and sounds with meaning. After the dyslexic students' level/stage of disability has been assessed, teachers need to consider which teaching methods to use and adapt accordingly. Pollock & Waller (1994) recommend a "structured, cumulative and multisensory method" (p. 31). This means following a basic, step-by-step approach that includes information which can be linked to the student's previous language knowledge. The multisensory part is necessary because it involves the student using his/her ears, eyes, speech and hands when learning a new word. Jordan (1977) recommends that teachers "provide concrete associative experiences between sounds and their symbol counterparts" (p. 92). He believes that



phonics do not work with auditory dyslexics because they are usually taught in the abstract. So, to avoid this eventual failure, teachers must adopt a multisensory approach. Auditory dyslexics must begin by matching and sequencing letters. Later, they move to spelling out simple words following a model by the teacher. Gradually, teachers introduce tangible methods so students can begin to link specific words with the symbols they can touch, feel and manipulate. There are special multisensory methods designed for students with severe reading problems.

a. VAKT – Visual, Auditory, Kinesthetic, and Tactile Methods:

This method involves stimulating the various senses to reinforce learning. In this method, the student sees the word, hears the teacher say the word, says the word, hears him/ herself say the word as s/he traces the word with his/her fingers. In this method, the emphasis is on stimulating the senses to reinforce learning. Manzo & Manzo (1996) outline the following steps:

- Step 1 – The teacher asks the student to suggest a word that he/she wishes to learn.
- Step 2 – The teacher then writes the word in large handwriting, using a black magic marker or grease pencil, and then speaks the word in a natural way as it is written.
- Step 3 – The learner traces the word with his/her fingers while speaking the whole word (not being permitted to say the individual letters of the word) and being careful to begin and end speech and writing at the same time.
- Step 4 – The learner does this as often as is needed, until he/she is certain to have learned the word.
- Step 5 – The learner then visualizes it and traces it in the air.

- Step 6 – The learner turns the word card over, takes another piece of paper, and tries to write the word from memory, writing and speaking at the same time.
- Step 7 – The learner compares this production with the original model.
- Step 8 – In extraordinary cases, a tray may be filled with moist sand, and the learner may be urged to trace the word in the sand.
- Step 9 – The words taught in this way should be reviewed daily in a short list with other words.

b. Fernald Method:

This is another approach involving the senses of sight, hearing and touch is the Fernald Method. This method was developed by Fernald and it involves 4 avenues simultaneously. The student traces one entire word, as the teacher reads it. This process is repeated until student can write the word correctly without looking at the original prompt. This is done repeatedly with different words. At a later stage, the student is required to write a story using these words, which is to be typed so the student can read it out loud. As the student progresses, he/she learns new words without tracing them, by simply looking at the printed form and repeating it internally before writing it. This method is quite effective and can be used to teach spelling (Lerner, 1997).

c. Repeated Reading Method:

Other reading strategies, which are not multisensory, are also effective in remediation of dyslexia. 'Repeated Reading' is such a method which is useful with slow, hesitant readers. Here, the student is given a selection of passages – 50 to 200 words – at a manageable difficulty rate. The student reads each passage three or four times orally before moving on to a new passage. The teacher keeps track of accuracy and fluency rates

and reports them to the student. 'Repeated Reading' can be quite enjoyable when done using a computer screen (Lerner, 1997).

d. Neurological Impress Method (NIM):

This method is designed for students with severe reading problems. It involves the teacher and student reading in unison out of one book. While reading, the teacher's voice must be directed into the student's ear at a fairly close range. As they read, the teacher might at times read louder and faster than the student. No preparation is required for this exercise. The object is to cover as many pages as possible within a limited period of time (Lerner 1977). 'Echo Reading' is a variation of NIM. It varies in that the teacher first reads segments of the material to establish comprehension. While reading, the student always reads in a lower voice, echoing (Manzo & Manzo, 1996).

e. K – W – L Method:

To improve reading comprehension, Lerner (1997) offers strategies that involve activating the student's background knowledge and building vocabulary meaning. While focusing on the student's background information, the teacher can follow the K-W-L Technique. This involves three questions in three steps of a lesson:

- K – What I know
- W – What I want to find out
- L – What I learned

The students work alone first answering the first question about the topic of the text they will read. Then they share their information in groups. This is repeated for the second question. Finally, after reading, the students answer the third question and then share their answers once more.

## 2. Vocabulary:

As for building meaning vocabulary, teachers can follow methods that expand the dyslexic students' vocabulary such as highlighting words with multiple meanings, providing concrete experiences, classifying vocabulary terms, making word webs and doing cloze exercises. Listening to stories can also benefit vocabulary expansion. As the teacher reads and the students listen while they follow along in the book, they come to recognize certain words. They observe that longer words look longer on the page and this can help them see how the printed word and the spoken word are related. Children can benefit immensely from reading aloud because they can learn to associate the printed words with the sounds and meanings of the spoken words (Shaywitz, 2004; Lerner, 1997).

## 3. Handwriting:

Lerner (1997) highlights several strategies for dealing with handwriting in a dyslexic class. These are briefly summarized in the points below.

- Chalkboard activities – these provide practice before writing begins. They involve drawing circles, lines, geometric shapes and so on. A wet sponge can be used to draw shapes on the chalkboard.
- Other materials – students can have writing practice through finger painting, clay-pan, or sand-tray writing.
- Tracing – students trace black figures on white paper covered with a transparent sheet.
- Dot-to-dot – the teacher draws a complete figure using dots. The students then make the figure by connecting the dots.

According to Richek et al., (1996) in Janet Lerner (1997), students with a reading disability usually encounter special types of problems such as reversals, finger pointing, lip moving, halting oral reading and poor silent reading. Students with dyslexia do not know how to interact with their texts effectively or how to merge the information they read with what they already know. They read slowly and hesitantly. They do not focus on comprehension. When they read something they do not understand, they do not stop and go back, instead they keep on reading and they lose more and more meaning. In general, students with dyslexia face two obstacles: "rapid work rate and pressure for quantity" (Jordan, 1977, p. 72). Dyslexics cannot work fast. They must be given enough time to encode and decode language symbols. They tend to panic when faced with time constraints. Additionally, when dyslexics are expected to complete large amounts of work within a limited time frame, they often give up. Teachers should expect dyslexics to work five to ten times slower than students with no learning disabilities. Therefore, they must allow for these limitations and recognize that dyslexics need more time and less work.

Teachers must recognize that dyslexic students need reinforcement with learning to read. Teachers can play listening games (identifying noises from a tape), tell stories and recount events, and teach children to clap simple rhymes. They can also practice sound discrimination, play games of matching and recognizing shapes, and do tactile work. Dyslexia in the classroom calls for simple, step-by-step routines that involve controlled stimuli. When lessons involve several factors, dyslexics get over stimulated and cannot perform well. Teachers must guide dyslexic from one skill to another at an even pace so that eventually these students can cope with complex tasks. The teachers' attitude plays an important role in the way students react. If a teacher expects success, the students will

sense this and respond positively. Of course, the success of a dyslexic requires more than positive attitude from the teacher; however, the teacher's expectations and attitude are critical for dyslexics (Pollock & Waller, 1994; Jordan, 1977).

Classroom environment and setting also play an important role in remediation. Every classroom should have visible and tangible reminders of sequence. These can be charts that show time relationships, the alphabet, and months of the year. These help the visual dyslexics in making their learning process easier by sparing them from constantly relying on their memory. Visual clues can be in the form of pictures, graphs, charts, colors or textures. They help students by lowering the pressure to succeed. These visual indicators also help dysgraphics and auditory dyslexics (Jordan, 1977).

Furthermore, Palombo (2001) recommends that parents send their dyslexic children to reading specialists and psychotherapists. He confirms that specialists have a high success rate with teaching dyslexics to read. As for psychotherapy, it is necessary because it deals with the dyslexics' problems of self-confidence. Palombo emphasizes the collaboration between the psychotherapist and the caregivers or school personnel as an essential part of the 'treatment'. When children are given non-academic tasks which can be achieved, their self-confidence will increase. Over time, this self-confidence is transferred to academic tasks in turn, helping the children respond better to their remediation program.

## Chapter Four: Method

### A. Case Study:

What is a case study? Gerring (2003) proposes a definition of a case study as “an intensive study of a single unit for the purpose of understanding a larger class of similar units” (p. 5). In order to understand this definition, one must look at a case study in terms of the following criteria:

1. It follows a qualitative method. It has a small sample.
2. It is ethnographic, clinical, participant-observation, and in the field.
3. The research is characterized by process-tracing.
4. The research investigates a single case.

In short, a case study involves a particular method of research. Rather than using large samples and following a rigid procedure to examine a limited number of variables, case study methods involve an in-depth examination of a single instance or event: a case. Case studies provide a systematic way of looking at events, collecting data, analyzing information, and reporting results. As a result, the researcher may gain a keen understanding of why the instance happened as it did, and what might become important to look a more exclusively in future research (Gerring, 2003).

In his book *Case Study Research: Design and Methods*, Yin (1989) notes that there are six types of case studies. The first type is the illustrative case studies. These describe a domain; they utilize one or two instances to analyze a situation. These case studies serve to make the unfamiliar familiar and give the readers common knowledge about the topic. The second type is the exploratory case studies. These condense the case study process; researchers may undertake them before implementing a large-scale

investigation. Third, there are the critical instance case studies. They examine one or a few sites for one of two purposes. One is to investigate a situation of unique interest with little or no interest in generalization. The second is to call into question a highly generalized assertion and testing it by examining one instance. The fourth type is program implementation case studies. These case studies are useful when concern exists about implementation problems. Good implementation case studies must invest sufficient time to obtain longitudinal data. Fifth, there are the program effect case studies, which can determine the impact of programs and provide inferences about reasons of success or failure. After identifying findings of specific interest, researchers may then implement case studies in selected sites to maximize usefulness of the information gathered. The sixth and last type is the cumulative case studies. These combine information from several sites collected at different times. They can have a retrospective focus or a prospective outlook (Yin, 1989).

To conclude, in general the case study offers a method of learning about a complex instance through extensive description and contextual analysis. The results explain why the instance occurred as it did, and what could be done in similar situations. This pilot research study is an exploratory, program implementation case study. It is a condensed study process to explore the current learning support program at the school in question and then offers suggestion to be implemented in the classroom.

#### B. Purpose:

Given the literature presented in chapters one, two and three, it is of great importance to investigate the issue of teaching methodology when dealing with dyslexia. The purpose of this pilot case study is to identify factors necessary to investigate teaching



methods used when dealing with dyslexia. It is of great importance to consider teaching methodology as one of the major factors affecting dyslexic children's progress in their academic environment.

### C. Problem:

The problem, as it exists in the classroom, is that the students are not motivated. In their daily work, the teacher usually follows the book page by page. All focus is on the exercises and sentences in the book. While reading, the teacher prompts the students frequently in order to move the class along. They are not given a chance to try more than once, so sometimes they wait for her to just tell them the answer. Correction is also done rather fast and without much explanation. The students are expected to keep up the pace in the classroom for they are constantly reminded that there is no time to waste. It was noted that these children need a strong, unyielding teacher for they tire easily and tend to lose concentration quite rapidly. This pilot case study will investigate whether following a multisensory approach as a teaching method would improve the academic performance of fourth grade dyslexic English students as compared to the same group of fourth grade dyslexic English students not exposed to multisensory methods. However, a brief explanation of case studies is in order to make the research clearer.

### D. Sample:

Participants for this pilot study were all fourth grade English students with dyslexia from Eastwood College's Learning Support Program, in a school in Metn, Lebanon. Participants in this pilot study were all males. They have been in this program more than one year. The five students in this class have all been diagnosed as dyslexic. They have short memory spans as they have to be reminded of previous work on a daily

basis. None of them have any discipline problems, which makes the class, run much more smoothly. In general, they are comfortable in their learning environment and this reflects in their confidence levels. They are sure of themselves and their answers, and when they make mistakes, they accept correction gladly. There is no hostility present towards each other or their teacher, and this gives their class a positive energy for learning; however, despite this stress-free environment, the students still have learning problems.

#### E. Instrument:

All materials taught in this class comes from Hornsby, Shear and Pool's book *Alpha to Omega – the A-Z of Teaching Reading, Writing and Spelling (5<sup>th</sup> ed)*. As both Hornsby and Shear are speech therapists, they believe that the starting point for dyslexia remediation is spoken language. They grade the vocabulary they focus on based on its frequency in daily use. In addition, they teach language structures starting with the simplest to more complex sentences (Miles & Miles, 1999). Learning assessment is based on the correct use of the vocabulary items chosen in the book for daily use.

Based on the multisensory methods discussed in the previous chapters, working with tracing was chosen. The students were exposed to the concept of tracing words first before attempting to write them. Tracing was used in a variety of ways, students were asked to trace in air, using paper, and on chalk. Additionally, some tracing activities were done while the students were blindfolded to heighten the sensory experience, while others were conducted with open eyes. For example of tracing prompts, see Appendices I and J.

## Chapter Five: Procedure and Results

### A. Research Design:

Based on the multisensory approach, work was done with a group of two students on reading, spelling, handwriting and dictation. The research was conducted as a small scale qualitative case study. This type of case study was discussed in chapter four.

### B. Procedure:

Students' learning was observed across seven sessions, timed at fifty minutes each, all of which covered the usual lesson from the regular course book given at the school for LD students. The five students were separated into two classrooms. One group, Group B (n=3), stayed with their teacher, while the second group, Group A (n=2) were taught by the researcher. Both groups followed the same lessons, yet were exposed to different teaching methodologies. All subjects were present in all sessions. The seven sessions were conducted in the following way:

- *Session 1:* Students were expected to learn specific vocabulary words. The children were given a dictation of the words they had been practicing with their teacher and classmates. The teacher had been working with the words chosen for dictation. It was decided not to review the words or refresh the children's memories before reading the dictation to observe how much information they had retained from the method their regular teacher follows. The students were given a dictation of the following words:

*bake – back – her – here – hair – slim – slime – hop – hope – fill – file, and the sentences  
He put his cap on his cape - The man can walk with a cane.*

- *Session 2:* The students worked with the alphabet and the days of the week. The children have access to an alphabet chart posted on the wall of the classroom, not to affect their performance; the students were seated with their backs to the chart. The alphabet was reviewed and students practiced tracing the letters on the table with eyes closed and then open. The session was run as a fun competition in which one child would see the letter and then guide the finger of the blindfolded one to trace the letter. The one with the blindfold would have to guess the letter. This review activity was most enjoyable for both children, who tried to outdo each other. After going over all the letters, the students were instructed to write the alphabet in order. Also in this session, students worked with spelling the days of the week. These had been taught before in class, practiced, read, copied, and dictated. Still, the teacher had indicated that the students were still having trouble with the sequence and spelling of the seven items. Based on Lerner's (1997) suggestions for vocabulary review, the students played Hangman to revise the days of the week through spelling the individual letters. After Hangman, the students wrote the days of the week from memory.

- *Session 3:* In the third session, the students were expected to acquire new vocabulary items from their book *Alpha to Omega*. First, both students were presented with the words *brain – drain – rain – wait – fail – nail – tail – chair – day – may – say – pay – pray – spray – sway – and okay*. The children were asked to attempt reading the words alone. Then when ready, each one read the words aloud. Naturally, they made some mistakes, but they were prompted to correct themselves. Reading the words was repeated five times until the boys could read all the words fluently. This was done as a variation of the Repeated Reading Method (Lerner, 1997), but using words not passages

to suit the academic level of the experimental group. In their usual class practice, the children get to read once in class and are asked to practice at home because of time constraints. The next day, they would re-read once in front of their teacher. This approach did not prove beneficial because they were always unable to read fluently the next day. As additional reading and writing practice, the children copied the words while reading them.

- *Session 4:* Session four also involved reading. However, this time the words were at a higher difficulty level. The following words were chosen from Jordan's Oral Screening Test, levels five to eight (Jordan, 1977, p. 160): *mother – farmer – around – understand – silver – exercise – accidental – knowledge – commercially – punishment*. The teacher had indicated that the students were only familiar with the words 'mother', 'farmer' and 'silver'. All the words were written on one paper. At first, the children tried to familiarize themselves with the words and see how many they knew or could read. Then, the words were read slowly, one by one while the students traced each word simultaneously. After re-reading, the students were asked to repeat after the instructor in unison. Then, all three read in unison from the same paper. At times, the instructor's voice rose above theirs to guide their aural perception. The next step involved each student reading alone, which was done quite well. Finally, the words were copied for extra practice. This activity was based on an adapted form of the VAKT method and the NIM method (Lerner, 1997), both of which proved most effective with the two students because they were enjoyable, which was clearly obvious from the students behavior. •

- **Session 5:** The fifth session was for copying and working on handwriting. The two students were not familiar with writing on unlined white paper. Their teacher had introduced paper with squares two weeks before. They had been accustomed to working on lined paper. The students were presented with a list of words: *exclaim – fairy – Spain – unfair – hair – holiday – and remain*. These words were chosen in collaboration with the teacher. As dyslexics usually have a hard time with penmanship and cursive writing, their teacher follows a daily activity program of copying. Both boys had expressed their dislike for cursive writing style because they find it difficult. So before attempting to copy any letters, students did a warm up with chalkboard activities. Based on Lerner's (1997, p. 488-490) suggestions of chalkboard activities, students were asked to draw several shapes on the board before starting to copy. This eased the tension of writing in cursive. The children drew circles, squares, rectangles and several geometric shapes in order to loosen up their hands. The next step was for the boys to copy the words using cursive handwriting, first on white unlined paper.

- **Session 6:** The next session involved homophones. The homophones were to be learned, read, traced and then written. Six homophones were given to the students:

pale – pail

tale – tail

fair – fare

The children were familiar with the meaning of the words 'tail' and 'fair', without any knowledge of their spellings. For this session, the Fernald Method would be applied. This method involves four sensory avenues simultaneously. The students traced one entire word, as it was read (see Appendix I for prompts). This process was repeated until

the students could write the word correctly without looking at the original prompt. This was done repeatedly with the six different words. At a later stage, the students were asked to write the six words from memory.

Then as a further step to this session, an exercise was conducted to check comprehension and retention of the words. A series of sentences was read to the students, in which the six homophones were present. The task was for the students to listen and write the correct form of the word they hear, based on their comprehension. The sentences were:

1. Is this fair?
2. My dog has a really long tail.
3. There is cold water in that pale.
4. I had to pay the train fare twice.
5. Her face went pale when she met him.
6. She told me a fairy tale.

- Session 7: On the last session, students practiced memory words. The students were presented with eight terms that have the sound 'oo' but do not all have the same pronunciation or spelling of the sound. These were taken from the course book, by the class teacher: *blue – foot – school – mood – threw – good – few – view*. In this activity, the words were first presented on paper (see Appendix J for prompts), and then traced on the board with wet fingers. Third, they were traced in the air, all the while being read out loud by the students. After some repetition, the children had to correctly write the eight words from memory. The class teacher teaching Group B taught the seven sessions using the course book without any supplementary materials following a traditional book-centered / teacher-centered approach. The researcher teaching Group A taught the seven

sessions using subject material from the book, but not the actual book. Subject material was presented on paper, through tracing, orally and through games.

### C. Results:

The effective use of multisensory methods as a teaching approach to improve the teaching method and learning outcome among dyslexic students was determined by comparing the work of Group A (n=2) with that of Group B (n=3).

#### Session One:

The results of session 1 where the students were given a dictation of the following words: bake – back – her – here – hair – slim – slime – hop – hope – fill – file, are as follows:

For the vocabulary items:

Table 6. Group A. Unrehearsed Dictation of Words

<i>Student</i>	<i>Total # of items</i>	<i># of correct items</i>	<i>% of accuracy</i>
1	1	6	55%
2	11	7	64%

Table 7. Group B. Unrehearsed Dictation of Words

<i>Student</i>	<i>Total # of items</i>	<i># of correct items</i>	<i>% of accuracy</i>
1	11	6	55%
2	11	5	45%
3	11	3	27%



For sentences:

Table 8. Sentence Dictation

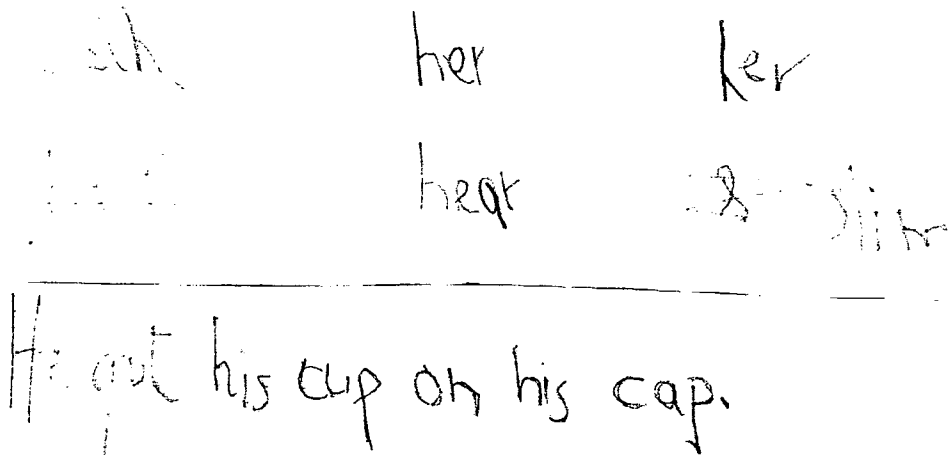
<i>Group</i>	<i>Total # of mistakes</i>	<i>% of accuracy</i>
A	6	57%
B	10	43%

In this session, the results of both groups are quite similar because it is a starting point session based on what the students had previously learned with their teacher in their classrooms. At this point, the results indicate the classroom teacher's effort and the students' starting base. The samples below of the students' work show their weaknesses in writing, staying on the line and spelling correctly. In the sample from Group B, the student not only misspells the words, but also transposes the letters in some words. This is a clear indication of their learning disability.

It is obvious that the three children in Group B were not able to do the dictation as well as the two students in Group A, which is unfortunate especially after their teacher had spent four hours teaching and practicing the words in class through repetition and drilling.

Figure 5. Student A – Unrehearsed Dictation

Dictation I  
 baik - pack - her - here - ner  
 celm - celime - hofpe - hop  
 fill - fite

Figure 6. Student B – Unrehearsed DictationSession Two:

In session two, students worked with the alphabet and the days of the week. They gave the following results, mixing the letters and writing in both cursive and printed styles.

Despite the trouble with the handwriting, the results were pleasing because the boys had also initially exhibited difficulty sequencing the letters.

Table 9. Group A. Letters of the Alphabet

<i>Student ..</i>	<i>Total # of letters written</i>	<i># of mistakes</i>
1	25	1
2	26	0

The results of this session were positive since the students hardly made any mistakes.

This is the first session the learners were exposed to tracing using their fingers on a table,

not on paper. The atmosphere of this session was fun because the two students were in competition so they tried to out-do one another. Their motivation levels can be seen in their results as opposed to the higher number of mistakes by Group B as seen in Table 10 below.

Table 10. Group B. Letters of the Alphabet

<i>Student</i>	<i>Total # of letters written</i>	<i># of mistakes</i>
1	26	3
2	26	2
3	26	4

The students in Group B were exposed to the letters of the alphabet in their course book. The items were read repeatedly and then tested. No multisensory work was used; this shows in the results with higher numbers of mistakes. The figures below show a sample from each group, exhibiting the difference in the performance.

Figure 7. Group A Sample – Alphabet Writing

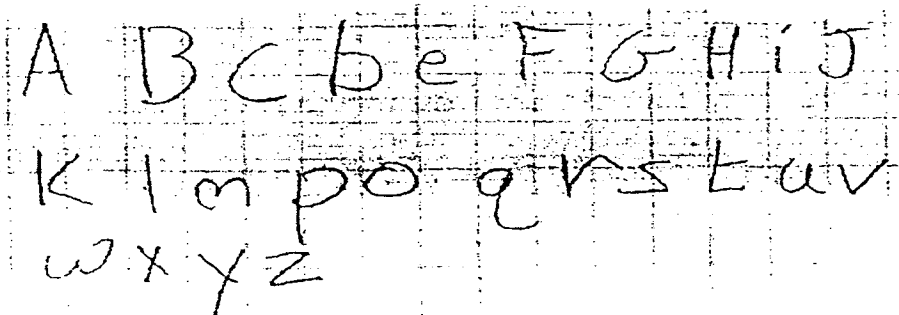
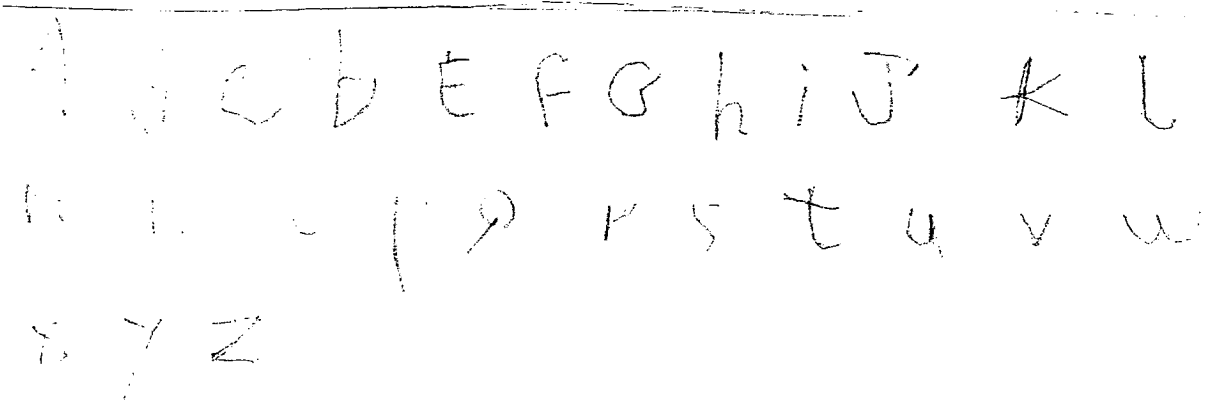


Figure 8. Group B Sample – Alphabet Writing



Also in this session, students worked with spelling the days of the week. The items were revised playing Hangman. Towards the end of the session, the students wrote the days of the week from memory, giving the results in the tables below.

Table 11. Group A. Days of the Week

<i>Student</i>	<i>Total # of items</i>	<i># of correct items</i>	<i>% of accuracy</i>
1	7	7	100%
2	7	4	57%

Table 12. Group B. Days of the Week

<i>Student</i>	<i>Total # of items</i>	<i># of correct items</i>	<i>% of accuracy</i>
1	7	4	57%
2	7	5	71%
3	7	3	43%

The results of this part of the session show a slightly higher accuracy rate for Group A, which followed the multisensory approach. These results represent that when learning is made to be a fun experience, children perform better. Samples from both groups can be seen below, showing a higher number of mistakes in Figure 10.

Figure 9. Group A Sample – Days of the Week

Days of the week  
 Monday - Tuesday - Wednesday  
 Thursday - Friday - Saturday -  
 Sunday

Figure 10. Group B Sample – Days of the Week

Monday - Tuesday - Wednesday -  
 Thursday - Friday - Saturday - Sunday

Session Three:

Students were presented with the words *brain – drain – rain – wait – fail – nail – tail – chair – day – may – say – pay – pray – spray – sway –* and *okay*. They read the words alone. Then when ready, each one read the words aloud. As additional reading and writing practice, the children copied the words while reading them (see Figures 6 & 7).

The results of this session can be seen in the tables below.

Table 13. Group A. Copy of Items after Reading

<i>Student</i>	<i>Total # of items</i>	<i># of correct items</i>	<i>% of accuracy</i>
1	16	10	62.5%
2	16	8	50%

Table 14. Group B. Copy of Items after Reading

<i>Student</i>	<i>Total # of items</i>	<i># of correct items</i>	<i>% of accuracy</i>
1	16	9	56%
2	16	7	44%
3	16	6	37.5%

Once more, the results are in favor of Group A. The children following the Repeated Reading Method mentioned earlier performed better than their classmates in Group B. their knowledge of the items is reflected in their written work, seen in the figures below.

Figure 11. Group A Sample – Copied Reading

Rtg I

brain	brain	fail	fail
drain	drain	nail	mail
rain	rain	tail	tail
wait	wait	chair	chair

Figure 12. Group B Sample – Copied Reading

---

day	day	pray	pay
may	may	spray	spray
say	say	sway	sway
pay	<del>pay</del> pay	okay	okay

Session Four:

Session four also involved reading of the following words from Jordan's Oral Screening Test, levels five to eight (Jordan, 1977, p. 160): *mother – farmer- around – understand – silver – exercise – accidental – knowledge – commercially – punishment.*

This activity was based on an adapted form of the VAKT method and the NIM method (Lerner, 1997), both of which proved most effective with the two students because they were fun and the students gave a positive accuracy level in their performance.

Session Five:

The fifth session was for copying and working on handwriting. The students were presented with a list of words: exclaim – fairy – spain – unfair – hair – holiday – remain. Based on Lerner's (1997) suggestions of chalkboard activities, students were asked to draw several geometric shapes (circles, triangles, squares and rectangles) on the board before starting to copy, to ease their tension. Next the students wrote out the words. The results are below:

Table 15. Group A. Cursive Writing

<i>Student</i>	<i>Total # of items</i>	<i># of correct items</i>
1	7	5
2	7	6

Table 16. Group B. Cursive Writing

<i>Student</i>	<i>Total # of items</i>	<i># of correct items</i>
1	7	4
2	7	2
3	7	4

As cursive writing was not a well-prepared skill with the students, both groups expressed difficulty in performing this task. However, Group A gave higher results than Group B



because the students had had the chance to loosen up and relax before writing in cursive. The samples below show the difference in the flow of the writing style between the two groups. Group B's work is not as smooth because they had not had any chance to warm up before the actual activity. One of the students found it extremely difficult to write in cursive especially on lined paper. When brought to the teacher's attention, she mentioned that he was the same in her class. This child was not yet accustomed to using cursive style because all his written training so far had been in printed style.

Figure 13. Group A Sample – Copy

---

Copy I

exclaim exclaim  
fairy fairy  
spain Spain  
unfair unfair  
holiday holiday

Figure 14. Group B Sample – Copy

---

exclaim                      up unfair  
fair                              hobby

Session Six:

This session involved homophones. The homophones were to be learned, read, traced, and then written. Six homophones were given to the students:

pale – pail

tale – tail

fair – fare

For this session, the Fernald Method, discussed earlier in chapter three, would be applied.

This method involves four sensory avenues simultaneously. At a later stage of the class and after ample tracing, the students were asked to write the six words from memory.

They completed this task giving the following results:

Table 17. Group A. Fernald Method

<i>Student</i>	<i>Total # of items</i>	<i># of correct items</i>
1	6	6
2	6	5

Table 18. Group B. Fernald Method

<i>Student</i>	<i>Total # of items</i>	<i># of correct items</i>
1	6	4
2	6	4
3	6	3

The students' results in this activity show a wider gap between both groups. Group A enjoyed doing this task, they were eager to learn the new words and trace them repeatedly. As a result of using the Fernald Method, all words were acquired accurately. The students in Group A enjoyed the Fernald Method, thus giving better results than Group B. The samples below show the difference in results between both groups.

Figure 15. Group A Sample – Fernald Method

Rate - Tail - Fair - Fare - Park - Pair

Figure 16. Group B – Fernald Method

tail      pale      fair  
 tale      pale      fair

Then as a further step to this session, an exercise was conducted to check comprehension and retention of the words. The results of the follow up comprehension activity were quite good as seen in the following:

Figure 17. Student Sample – Homophones

1. Fair
2. Tale
3. Pale
4. Fare
5. pall
6. tail

Session Seven:

In the last session, students practiced the memory words: blue – foot – school – mood – threw – good – few – view. This activity involved tracing the words repeatedly and then writing them from memory. The results can be seen in the tables below.

Table 19. Group A. Memory Words

<i>Student</i>	<i>Total # of items</i>	<i># of correct items</i>
1	8	7
2	8	7

Table 20. Group B. Memory Words

<i>Student</i>	<i>Total # of items</i>	<i># of correct items</i>
1	8	5
2	8	3
3	8	3

Once more, the performance of the students following the multisensory method was higher than those following the traditional book approach. Group A's scores are quite higher than those of Group B in this last session because they had become accustomed to the tracing method and had improved. A sample of their progress in writing can be seen below, as opposed to Group B's sample.

Figure 18. Group A Sample – Memory Words

---

Blue Foot School Good  
Food View Threw

Figure 19. Group B Sample. Memory Words

Memory Words  
Blue school mood threw  
Foot Good Few View

## Chapter Six: Conclusions

It was found that the results of each of the sessions were close between Group A and Group B, which suggests that a change in methodology is what is needed for these students to become interested in their classroom materials. Based on the outcome of this case study, one can see that following a multisensory approach to teaching these children will improve their classroom performance and achievement. The students in the Learning Support program show some signs of learning problems; however, they are not severe signs of disabilities. Their classroom is run in a traditional, teacher-centered manner, which deeply affects the students' interest levels and motivation. For this reason, Group A gave more accurate results than Group B. The results varied because a different approach to teaching was applied, one which is fun and educational at the same time.

Dyslexia, which affects a great number of people worldwide, is one type of specific learning disability that involves a person's ability to read. Dyslexics learn at their own level and pace, and typically excel in one or more other areas. Individuals with dyslexia are of average intelligence or above. They have trouble with concentration, perception, verbal skills, hand-eye coordination, and social adjustment. Often, people with dyslexia are considered to be lazy, rebellious, unmotivated, or of low intelligence. These misconceptions, without understanding dyslexia's effect on a person's life, can lead to rejection, feelings of inferiority, discouragement, and low self-esteem (Shaywitz, 2004; Palombo, 2001; Lerner, 1997; Jordan, 1977).

Giving dyslexic children the right kind of teaching can improve their performance greatly. A dyslexic student must learn new information in adaptive methods. Learning

support programs in schools must follow an eclectic approach to teaching because no two dyslexics learn the same way.

Multisensory methods of teaching / learning engage the visual, auditory, kinesthetic, and tactile senses. They involve meaning and pronunciation where the student reads the word correctly then uses it in a sentence, imagery where the student sees the word and says it syllable by syllable while tracing it, and recall where the student looks at a word then closes his/her eyes to see it in his/her mind's eye before spelling the word orally and then opening his/her eyes to check if correct. They also involve writing the word where the student writes the word from memory then checks if correct, and finally mastery where the student covers a word and writes it. If correct, the student covers and writes the word again (Lerner, 1997). Using a multisensory approach, the dyslexic students can take part in learning experiences that integrate their senses with their mental abilities, making the learning experience rewarding and fun.

#### A. Limitations:

A comparison check was conducted with the teacher and Group B, the group of three students who had been studying the same words but in different methods. It was found that she was not satisfied with their performance, which was fairly behind that of the two students in Group A.

The pilot case study had various limitations, which affected the results. For one, the time constraints were tight because it was not possible to have any more sessions with the students, as they had to return to their classroom and join their classmates. Second, the sample was quite small for such a study. It needed to have been a much larger group of students for better, more accurate results. The third limitation is the methodology



being followed in teaching these children. Using a traditional approach is not an effective way to teach, neither in 'normal' classes nor in LD classrooms. The students in Group B were not progressing due to their learning disability as well as the dull methods in which the material was being presented to them. A final point worth mentioning is the teacher herself. This did not pose a limitation to the research; however, it had an impact on the students' performance. She was not qualified to teach dyslexic children in a learning support program. Even though she has teaching credentials, she is not skilled to teach children with learning disabilities. Moreover, she has low energy and a careless attitude. When approached with suggestions, she stated that she could care less if the students learn because she is very tired of them. Despite all these limitations, some implications can be made for a more in-depth case study in teaching methodology of dyslexic students.

#### B. Implications:

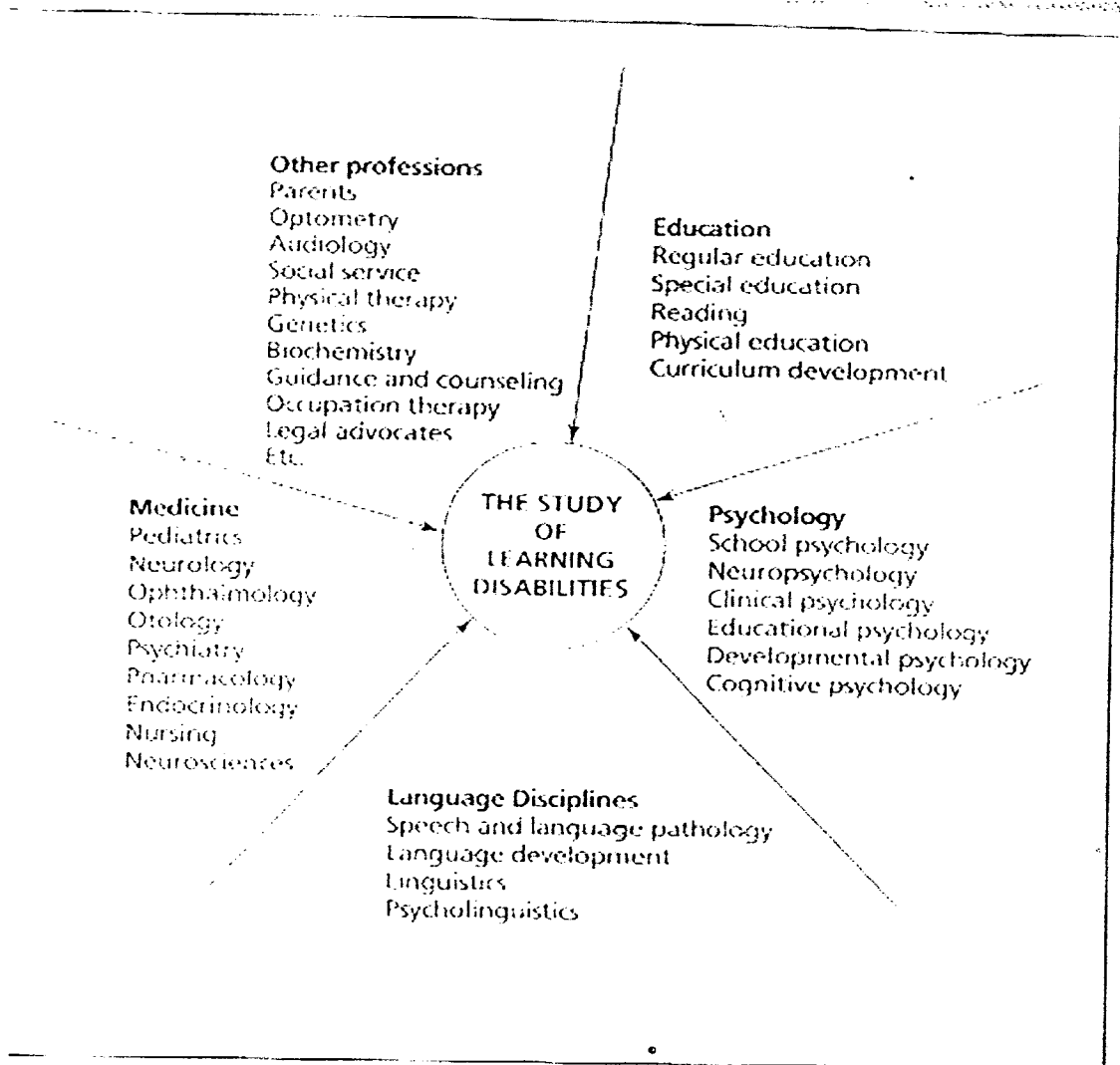
The three dyslexic students in Group B had been unable to master the terms presented to them, to the level of the others, but it is necessary to mention that they did not fall greatly behind Group A. After the findings were presented and discussed with the class teacher and to the learning support coordinator, it was agreed that the suggested multisensory method could be used in the program. In my opinion, it proved to be of great importance to involve all the physical senses of these dyslexic students as a way to keep them motivated and interested. If I were to conduct this research another time, I would include additional methods to test if they are beneficial like the multisensory approach. In the end, teachers must remember that these elementary years will affect the rest of their students' academic careers. When teachers adhere to traditional methods and

are afraid to deviate from their textbooks, it is their students who will suffer, especially if these students have special learning needs. If a dyslexic child is not encouraged to learn and explore, s/he will never be able to cope with dyslexia. Therefore, it is essential for teachers to be aware of various approaches to dealing with dyslexia in their classrooms, for their own professional development and for the benefit of their students.

Appendix A

Interdisciplinary Field of Learning Disabilities

This figure from Lerner (1997, p. 29) shows all the fields involved in dealing with learning disabilities.



## Appendix B

## Visual Dyslexic's Work Sample

This is a sample of mistakes that visual dyslexic children make in their writing (Jordan, 1977, p. 23)

Lesli *female* Age: 6 years, 7 months  
Grade: 1.6  
IQ: 114 Stanford-Binet

A B C D F G H I J K L W h O P Q  
h + y V M X Y S

Paul Age: 7 years, 3 months  
Grade: 2.2  
IQ: 135

b → J  
x → t  
e → e  
r → P  
m → w  
7 → 7f

## Appendix C

This checklist serves as a guideline for diagnosing individuals with visual dyslexia  
(Jordan, 1977, p. 26).

*Checklist of Visual Dyslexia Symptoms*

\_\_\_\_\_ Confusion with Sequence

- \_\_\_\_\_ has poor concept of time
- \_\_\_\_\_ has poor concept of chronological order of events
- \_\_\_\_\_ cannot give day, month, and year of birth
- \_\_\_\_\_ cannot repeat months of the year
- \_\_\_\_\_ cannot repeat days of the week
- \_\_\_\_\_ cannot remember multiplication tables

\_\_\_\_\_ Difficulty Following Directions

- \_\_\_\_\_ cannot remember daily routines at home
- \_\_\_\_\_ cannot follow teacher's directions in classroom
- \_\_\_\_\_ cannot comprehend instructions when given to a group; needs individual explanation
- \_\_\_\_\_ need constant reminding of what to do

\_\_\_\_\_ Faulty Oral Language

- \_\_\_\_\_ is fluent at telling stories or giving oral reports
- \_\_\_\_\_ discusses information from non-reading sources
- \_\_\_\_\_ has difficulty with correct sequence of events

\_\_\_\_\_ Faulty Reading Comprehension

- \_\_\_\_\_ fails to identify main ideas
- \_\_\_\_\_ tells story events out of sequence
- \_\_\_\_\_ loses meaning of sentences or paragraphs before reaching the end
- \_\_\_\_\_ fails to draw inferences from what has been read
- \_\_\_\_\_ has difficulty reading details when answering comprehensive questions

\_\_\_\_\_ Slow Work Pace

- \_\_\_\_\_ seldom finishes timed exercises
- \_\_\_\_\_ easily frustrated when pressured for speed
- \_\_\_\_\_ work pace considerably slower than classmates
- \_\_\_\_\_ can do satisfactory work if given ample time and help
- \_\_\_\_\_ will not use full time allowance on timed tests; guesses marking items at random

\_\_\_\_\_ Difficulty with Alphabet

- \_\_\_\_\_ does not know alphabet in correct sequence
- \_\_\_\_\_ omits certain letters from alphabetic sequence
- \_\_\_\_\_ mixes capital and lowercase letters
- \_\_\_\_\_ mixes manuscript and cursive styles
- \_\_\_\_\_ makes certain letters backwards, upside down
- \_\_\_\_\_ sings alphabet song or repeats rhyme to check sequence
- \_\_\_\_\_ confuses similar letters
- \_\_\_\_\_ is not able to synchronize voice, finger, and eyes while checking work

\_\_\_\_\_ Confusion with Symbols

- \_\_\_\_\_ demonstrate poor perception when symbols are traced on back
  - \_\_\_\_\_ perceives symbols upside down
  - \_\_\_\_\_ perceives symbols backward
  - \_\_\_\_\_ distorts shapes of symbols
  - \_\_\_\_\_ rotates positions of symbols
- \_\_\_\_\_ writes with capital B and D
- \_\_\_\_\_ confuses certain symbols in reading, writing, and arithmetic
- \_\_\_\_\_ cannot conserve form in copy work
 

_____ b - d - p - q	_____ h - n
_____ h - y	_____ m - w
_____ r - n	_____ l - i
_____ r - c - s	_____ n - u
_____ f - t	_____ N - Z
_____ 3 - E	_____ 6 - 9

\_\_\_\_\_ Errors in Oral Reading

- \_\_\_\_\_ reverses whole words
- \_\_\_\_\_ reverses beginning letters
- \_\_\_\_\_ transposes l and r in consonant blends
- \_\_\_\_\_ substitutes similar letters or words
- \_\_\_\_\_ transposes letters inside words
- \_\_\_\_\_ fails to perceive minimal cues in words
- \_\_\_\_\_ fails to perceive minimal cues in punctuation
- \_\_\_\_\_ omits endings
- \_\_\_\_\_ telescopes (leaves out letters or syllables)
- \_\_\_\_\_ perseverates (adds extra letters or syllables)

\_\_\_\_\_ Errors in Spelling

- \_\_\_\_\_ transposes silent letters within words
- \_\_\_\_\_ does not recall correct order of letters
- \_\_\_\_\_ misplaces silent e

\_\_\_\_\_ Errors in Arithmetic

- \_\_\_\_\_ reverses processes while computing
- \_\_\_\_\_ carries or borrows wrong digit
- \_\_\_\_\_ cannot organize facts in story problems

\_\_\_\_\_ Errors in Copying

- \_\_\_\_\_ loses place on board (far point)
- \_\_\_\_\_ misspells on paper
- \_\_\_\_\_ fails to observe capital letters
- \_\_\_\_\_ fails to observe punctuation
- \_\_\_\_\_ fails to space properly
- \_\_\_\_\_ erases frequently
- \_\_\_\_\_ overprints to correct mistakes
- \_\_\_\_\_ reverses letters
- \_\_\_\_\_ reverses whole words
- \_\_\_\_\_ telescopes
- \_\_\_\_\_ perseverates
- \_\_\_\_\_ works unusually slowly
- \_\_\_\_\_ seeks to terminate to avoid copying tasks

## Appendix D

This checklist serves as a guideline for diagnosing individuals with auditory dyslexia (Jordan, 1977, p.48).

Checklist of Auditory Dyslexia Symptoms

## \_\_\_\_\_ Confusion with Phonics

- \_\_\_\_\_ cannot distinguish differences in vowel sounds  
 \_\_\_\_\_ does not perceive long vowel sounds  
 \_\_\_\_\_ does not perceive short vowel sounds  
 \_\_\_\_\_ does not perceive schwa vowel sounds  
 \_\_\_\_\_ does not comprehend variant vowel sounds  
 \_\_\_\_\_ cannot distinguish differences in consonant sounds  
 \_\_\_\_\_ does not perceive differences between similar consonant sounds:  
 \_\_\_\_\_ /b/ /d/ \_\_\_\_\_ /b/ /p/  
 \_\_\_\_\_ /d/ /t/ \_\_\_\_\_ /g/ /k/  
 \_\_\_\_\_ /m/ /n/ \_\_\_\_\_ /f/ /v/  
 \_\_\_\_\_ /s/ /z/ \_\_\_\_\_ /th/ /f/  
 \_\_\_\_\_ does not identify elements within consonant clusters  
 \_\_\_\_\_ cannot interpret diacritical markings  
 \_\_\_\_\_ cannot interpret phonetic respellings

## \_\_\_\_\_ Confusion with Symbols

- \_\_\_\_\_ cannot tell when words are alike or different  
 \_\_\_\_\_ cannot detect or reproduce rhyming words  
 \_\_\_\_\_ gives garbled pronunciation (echolalia)

## \_\_\_\_\_ Confusion with Spelling

- \_\_\_\_\_ writes very slowly  
 \_\_\_\_\_ depends upon mnemonic devices to recall spellings  
 \_\_\_\_\_ is not able to apply phonic generalizations when spelling  
 \_\_\_\_\_ tends to spell phonetically  
 \_\_\_\_\_ breaks consonant clusters when spelling (transposes land r)  
 \_\_\_\_\_ confuses sound values of consonant letters:  
 \_\_\_\_\_ c for k \_\_\_\_\_ f for v  
 \_\_\_\_\_ m for n \_\_\_\_\_ d for t  
 \_\_\_\_\_ s for z \_\_\_\_\_ f for th  
 \_\_\_\_\_ does not perceive sounds of /m/, /n/, /l/, /w/, or /r/  
 \_\_\_\_\_ leaves out sound units when writing words (telescopes)  
 \_\_\_\_\_ adds sound units when writing words (perseverates)  
 \_\_\_\_\_ does not perceive vowel sounds within words  
 \_\_\_\_\_ does not perceive syllables within words  
 \_\_\_\_\_ does not remember variant or unusual spellings  
 \_\_\_\_\_ is not able to retain memory stock of basic spelling words



- \_\_\_\_\_ asks speaker to repeat
- \_\_\_\_\_ erases, marks over, crosses out
- \_\_\_\_\_ attempts to hide work while writing

- \_\_\_\_\_ Reinforcement While Writing or Reading
  - \_\_\_\_\_ whispers (sub vocalizes) while reading silently
  - \_\_\_\_\_ whispers (sub vocalizes) while writing

## Appendix E

## Handwriting Sample 1

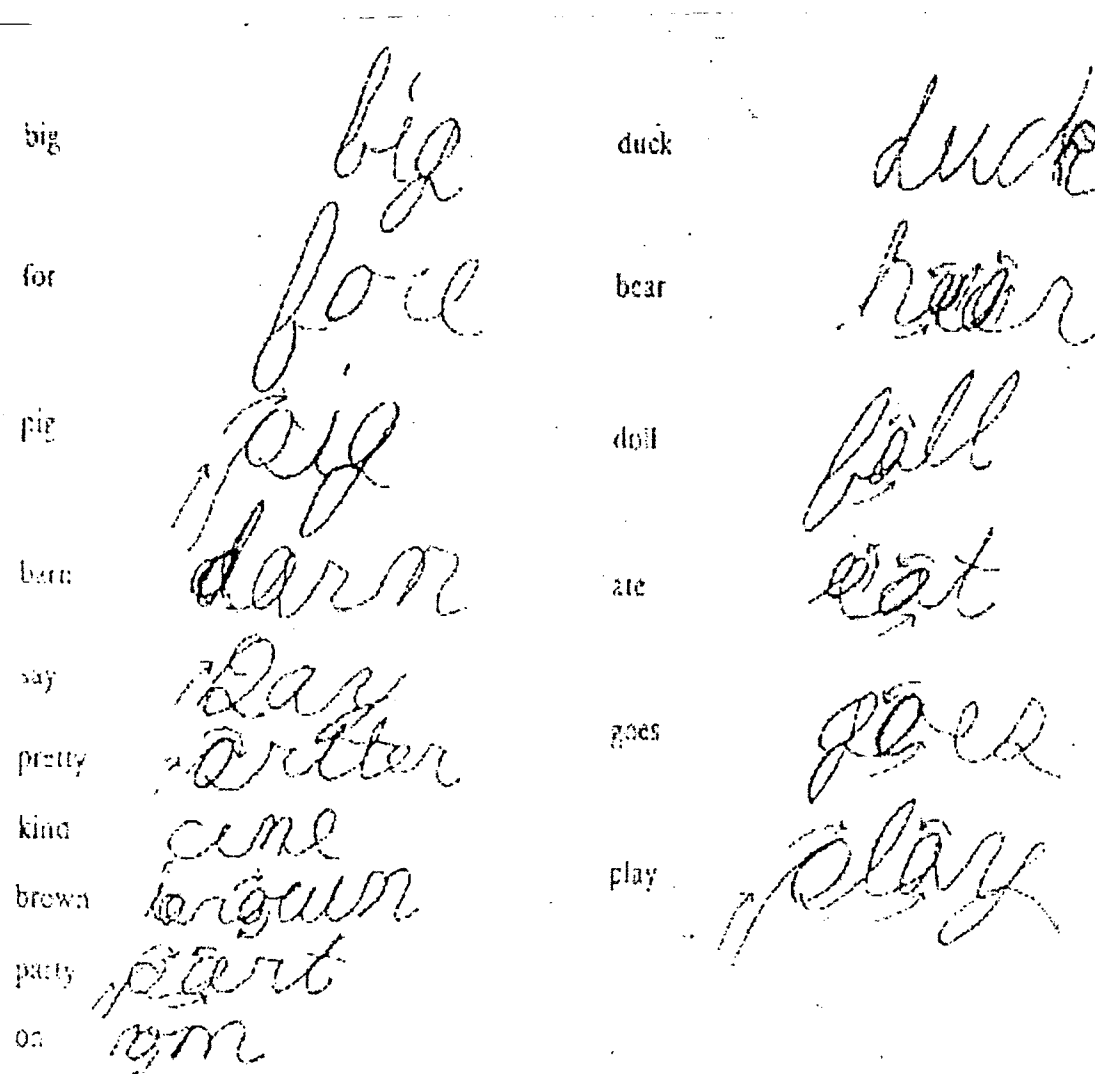
This specimen below of Glenda's handwriting, grade four, shows how her teacher has tried to trace the letters (Jordan, 1977, p. 53).

Glenda  
a d c b e f g h  
i j k l m n o p  
q r s t u v  
x y z

## Appendix F

## Handwriting Sample 2

Another example from Jordan (1977, p. 54) is of Glenda's work illustrating her inability to write with continuity. She circles certain letters over and over (d, b, a, o, and e) because she is forced to break the continuity. She cannot remember how or where to change her hand direction.



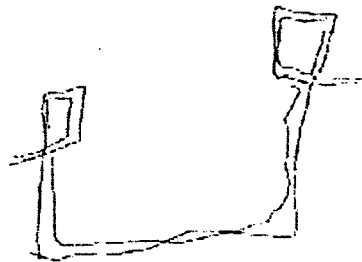
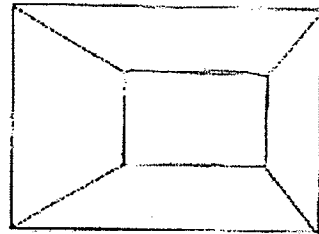
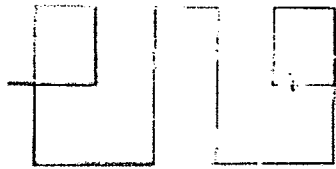
Appendix G

Reversed Sequence Sample

As seen in the example below, the children have reversed the sequence of the sketches by drawing the second one first (Jordan, 1977, pp. 64-65).

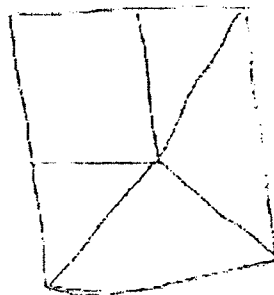
Maria

Age: 8 years,  
2 months  
Grade: 2.7  
IQ: 108



Dana Jo

Age: 7 years,  
7 months  
Grade: 2.3  
IQ: 97



## Appendix H

This checklist serves as a guideline for diagnosing individuals with the third type of dyslexia, dysgraphia (Jordan, 1977, p.68).

*Checklist of Dysgraphia Characteristics*

\_\_\_\_\_ Dysgraphia with Alphabet or Number Symbols

- \_\_\_\_\_ does not remember how to write certain letters or numerals
- \_\_\_\_\_ distorts shapes of certain letters or numerals
- \_\_\_\_\_ overall writing effort is awkward, uneven
- \_\_\_\_\_ has difficulty transferring from manuscript to cursive style
- \_\_\_\_\_ continues to print manuscript style long after introduction to cursive style
- \_\_\_\_\_ fragments certain letter or numeral forms
- \_\_\_\_\_ writing resembles 'bird scratching' is virtually illegible
- \_\_\_\_\_ mixes capital and lower case forms

\_\_\_\_\_ Confusion with Directionality

- \_\_\_\_\_ writes certain letters, numerals, or words in mirror image
- \_\_\_\_\_ tends to write on mirror side (left side) of vertical midline when moving to next column
- \_\_\_\_\_ marks from bottom to top when forming certain letters or numerals
- \_\_\_\_\_ uses backwards (clockwise) motions when forming loops in certain letters or numerals
- \_\_\_\_\_ erases or overprints habitually to change directions of certain letters or numerals
- \_\_\_\_\_ writing tends to slant up, down, or to wobble up and down

\_\_\_\_\_ Sentence Structure

- \_\_\_\_\_ composes meaningful content in spite of poor handwriting
- \_\_\_\_\_ transposes grammatical elements within sentences, but produces good overall meaning
- \_\_\_\_\_ tends to use complete sentence forms instead of fragments

\_\_\_\_\_ Difficulty Conserving Form in Copying Simple Shapes

- \_\_\_\_\_ distorts simple shapes
- \_\_\_\_\_ fails to close corners
- \_\_\_\_\_ draws 'ears' where lines meet or change direction
- \_\_\_\_\_ has difficulty reproducing simple designs from memory
- \_\_\_\_\_ work deteriorates toward end of writing exercise
- \_\_\_\_\_ has difficulty staying on lines when tracing

\_\_\_\_\_ Tendency to Telescope

- \_\_\_\_\_ omits letters when writing words
- \_\_\_\_\_ omits syllables or sound units when writing words
- \_\_\_\_\_ runs letters and words together
- \_\_\_\_\_ runs words together (usually when copying)

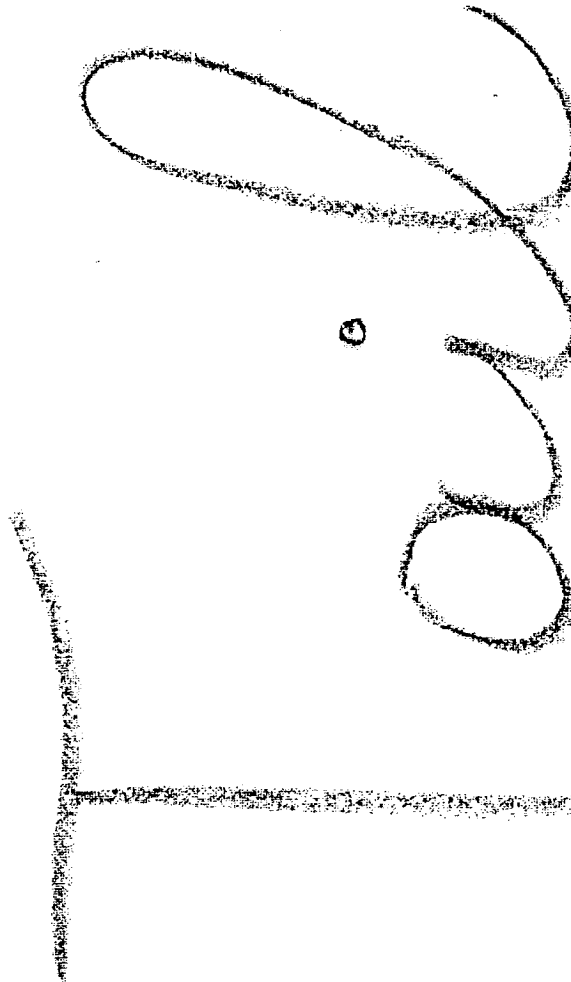
\_\_\_\_\_ Tendency to Perseverate

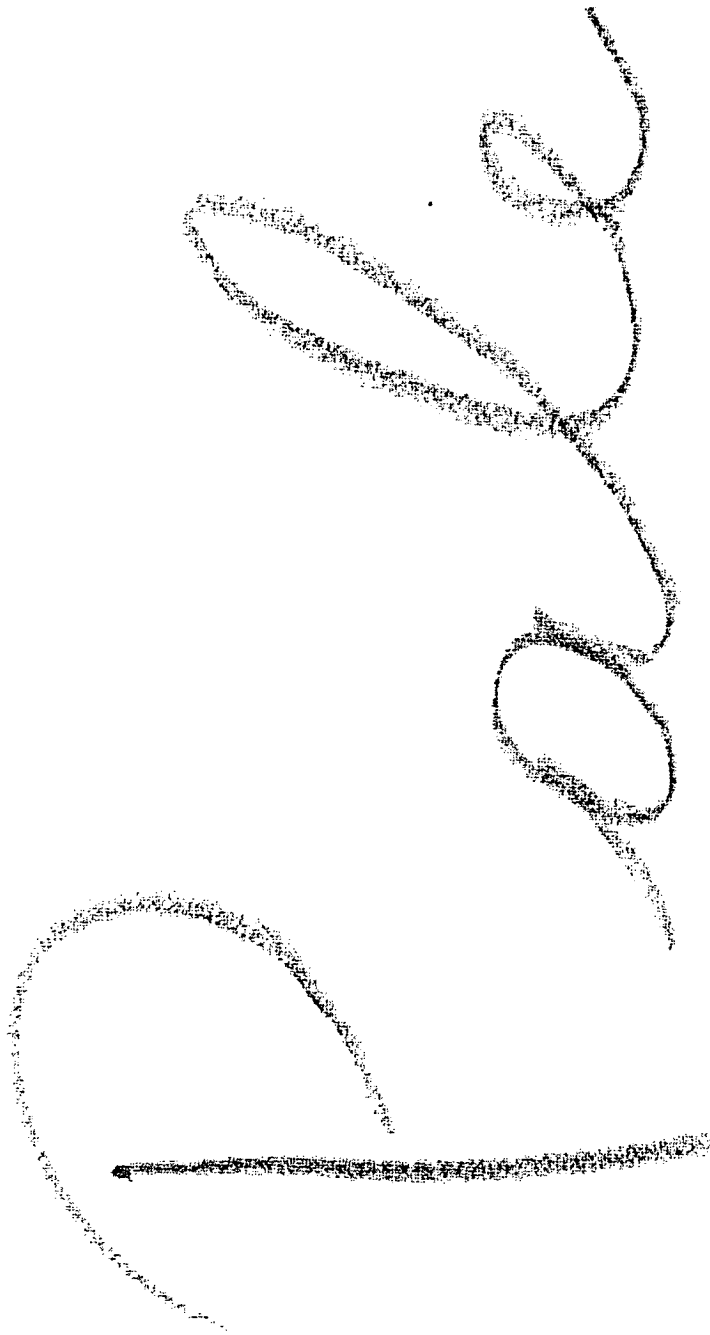
- \_\_\_\_\_ adds unnecessary letters or sound units to written words
- \_\_\_\_\_ repeats the same letters or syllables in written words
- \_\_\_\_\_ adds unnecessary sound units to spoken words
- \_\_\_\_\_ repeats syllables or sound units in spoken words
- \_\_\_\_\_ falls into parrot-like repetition of rhyming units during games or conversation

## Appendix I

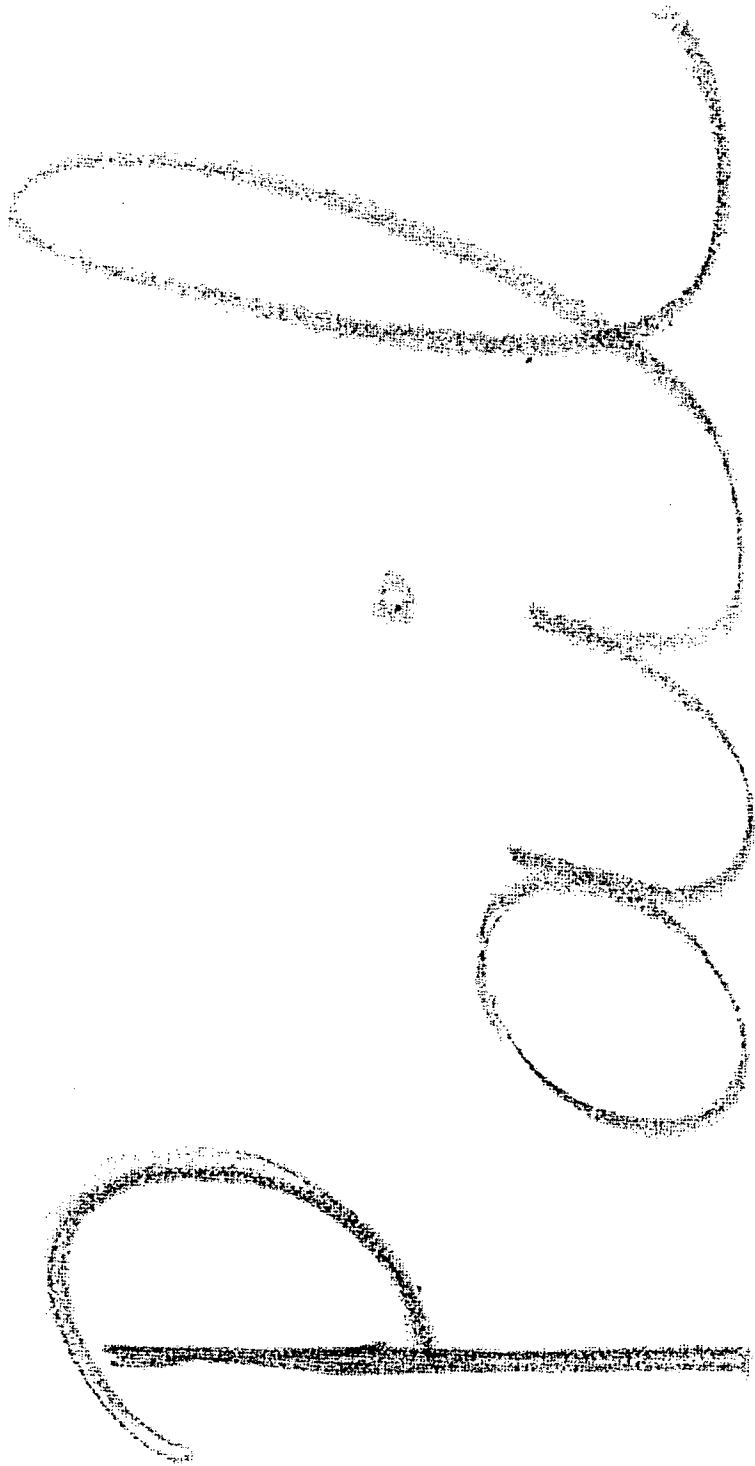
## Fernald Method Prompts

The prompts below were used in the study to investigate and apply the Fernald Method, which involves following a multisensory approach focusing on touch.



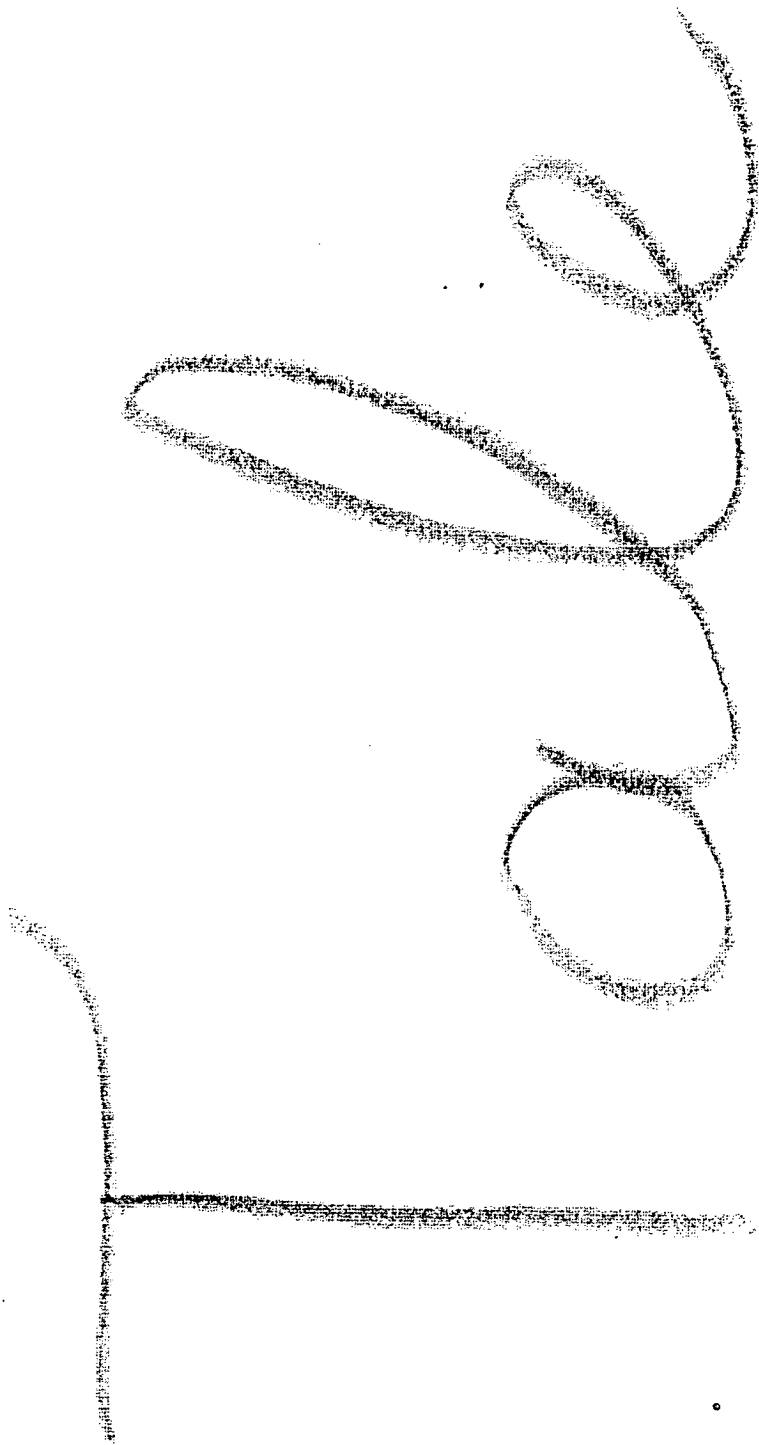






120

Handwritten text, possibly "T. 1000" or similar, written in a cursive style.



Appendix J

Tracing Prompts

The following tracing prompts were used with the students to trace and then write out.

---

School

Blue

---

Few

Good

---

Mood

Threw

---

View

Foot



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