THE LONG-TERM EFFECTS OF CLINICAL INDIVIDUALIZED REMEDIAL INSTRUCTION FOR READING DISABLED CHILDREN

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by

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Abstract

A follow-up study was conducted of 36 students seen at an education clinic between 1971 and 1981. Group 1 received an educational assessment only and group 2 received an assessment plus varying amounts of individualized remedial reading instruction.

Data was collected using a parent questionnaire, and information gathered from school cumulative records and clinic files. A variety of statistical procedures was used to analyse the data. Although no significant differences were found between the two groups, when separate analyses were conducted for group 2 subjects it was found that the length of clinical remediation had beneficial effects. For example, those given the longest period of remediation obtained higher job placements as measured by the Blishen Occupational Scale. It also fostered an improved attitude toward reading and more effective use of the skill for information purposes. These benefits increased in proportion to the length of treatment provided. Findings also indicated that IQ and socioeconomic background are primary predictors of academic success for learning disabled children irrespective of whether or not remediation for reading problems is received.

Implications for educators involve promotion of increased knowledge on the topic of learning disabilities and the need for co-operation in both parents and

teachers. The importance of early identification, diagnosis and intervention is stressed. The goal of remediation should be to provide sufficient help to enable children to cope with their disability, which is unlikely to disappear. Remediation must be intensive and sometimes of long duration. School support should be maintained following termination of clinical remediation, and tutorial help provided throughout schooling where necessary.

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CHAPTER I

THE INTRODUCTION

Statement of the Problem

"It is the satisfying experiences of childhood that kindle the inner spark that makes even a difficult life worthwhile" (Golick, 1978). These satisfying experiences come about through relationships with other people. Children's perceptions start in infancy and their early family life conditions the impressions they develop of the world and of themselves. Children tend to adopt the attitudes toward themselves that they perceive others have of them, initially their parents and later their teachers and peers. Psychologists and educators believe that it is the sum total of all experiences that determines personality development and self-concept.

One of the most satisfying experiences is that of successful accomplishment which is rewarded with praise and recognition. In school, children receive positive stimulation from doing well which, in turn, influences behavior and learning achievement. Children are by nature filled with curiosity about the world and enjoy learning when they are happy and when their lives are filled with variety, fun and activity. They thrive on love, attention, approval and acceptance as being persons of worth. If all goes well in family and school life and they are given the above prerequisites, children will

build a good self-concept. Generally by adolescence a positive self-regard is in place which enables an individual to strive successfully for self-actualization; that is, to become what one has the potential to become.

For some children this does not seem to happen. In our educational system, school often means failure to those who have problems in learning to read. Satisfying experiences are rare indeed. Inability to read in a society that prizes literacy is a great handicap. Instead of experiencing successful accomplishment, praise and recognition, they have to work harder than their classmates to achieve less, continually struggle to make sense of meaningless symbols while suffering the mental and emotional fatigue of stress, disappointment and confrontation with parents and teachers whose expectations for them are not being met and, as well, endure taunting or rejection by their peers.

Life becomes a dreary routine of attempts to succeed or even cope with the demands of home and school that involve books, notes, directions, tests and homework, all of which are too difficult. In a world that is full of negative experiences, failures, labelling, headshakes, frowns, and lectures, happiness is lost. The children develop anxieties, feel ashamed, expend energy in avoidance tactics, dislike reading and often become overwhelmed and depressed. Their self-esteem becomes deflated; they come to think of themselves as losers and

behave as such. Once a negative self-concept is established it is a difficult trait to change. Not only does a poor self-image interfere with learning to read, but the resulting reading disability leads to even more failure and less self-worth. A vicious circle of failure is set in motion. Unless something is done to break the cycle or reverse the trend so that the child begins to achieve and feel capable and worthwhile, it is very likely that he/she will become another dropout statistic.

Many students referred for a diagnostic reading assessment and individualized remediation have much the same story. The parents are very concerned. They feel their children are quite normal in most respects. They are smart, they know everything they see on television and they are pretty good at sports, but they are having a lot of problems in school because they can't read as well as their classmates. The teachers have explained that, although help is being given whenever possible, such children need one-to-one remediation and a special program suited to their needs. With so many other children in the class, there just isn't enough time to do any more..

After an initial diagnosis, and a period of one-to-one remediation, reading clinic observations suggest that these children can make good progress in overcoming their problems. The younger the treatment begins, the greater the chance of success. There is well-documented evidence in student files to indicate that through an interaction

of instruction with self-concept improvement, short-term benefits result from individualized remediation. The question still remaining is: Do these benefits continue, following remediation, so that the children's long-term educational, occupational and social/psychological prospects are enhanced?

Purpose of the Study

The purpose of this study, then, was to assess the long-term impact of reading remediation on academic standing during high school and post secondary education, on career opportunities and attainments, and on the ability to function socially in society. It has been widely accepted that the inhibiting effects of reading problems become more pronounced with the severity of the disability, and will also take longer to ameliorate. For this reason an attempt was made to determine whether the length of the treatment period had any significant bearing on the outcomes being examined. Since there are other factors than remediation or number of treatments accounting for success in the above mentioned areas, factors such as intelligence, father's occupation and grades repeated, were taken into consideration as well. The major objectives for the study included the following.

(1) The extent to which high school graduation, final school marks, last grade of high school

completed and college/university attendance were affected by either remediation or length of treatment was considered.

(2) Whether selected career outcomes were influenced by remediation or length of remedial treatment was considered.

(3) Whether selected affective attributes characteristic of students with learning problems (shyness, frustration, over dependence, minimal participation in social/recreational activities) were changed as a consequence of remediation or length of treatment was considered.

Need for the Study

Balow (1965) found that most studies documenting the change in reading performance following a period of intensive remedial instruction usually report only the immediate post-instruction results. Bruck (1985) noted as well, that knowledge of the history and continued effects of learning disabilities beyond childhood is limited. Long-term studies that have been done do not present consistent results concerning the adult consequences for the learning disabled child. Some researchers report optimistic outcomes while others present a bleak picture with many negative consequences. While results suggest

that learning disabilities persist throughout adolescence and adulthood, there are conflicting speculations regarding the learning disabled adult's educational, literacy, occupational, social, and emotional functioning and status. It seems important to provide some empirical data on these issues.

The present study was undertaken in order to obtain a comprehensive picture of the specific long-term effects of individualized remediation on academic, occupational, and social/psychological outcomes for children with reading difficulties. The study took the form of a follow-up survey of former students of the Diagnostic and Remedial Unit at Memorial University. A comparison was made between an early group of learning disabled students who received diagnosis but no clinical remediation and a later group who received weekly individualized clinical remediation in addition to the diagnosis. Over 2000 children have been seen in the Diagnostic and Remedial Unit. With its systematically kept student files, there is a pool or data base that offered a unique opportunity to do a longitudinal study in order to better understand the long-term results for children who had received individualized remedial reading instruction.

Practically, it is anticipated that such a study would provide valuable information for use in the organization and development of student programs within a clinical setting. Theoretically, the findings could have

ramifications for the provision of reading remediation services in general.

Setting for the Study

The study was conducted in the Diagnostic and Remedial Unit of Memorial University of Newfoundland. The diagnostic component of the Unit was established in 1971 when Dr. Roger Barnsley, Research Fellow in the Institute of Research in Human Abilities, received funding from the Provincial Department of Health to establish a Learning Centre. The purpose of the Centre was to screen children for learning disabilities and to conduct research studies in the area of learning disabilities in order to develop improved diagnostic and therapeutic techniques. Children who were referred to the Learning Centre by medical and educational practitioners were assessed using a battery of standardized tests. The information gathered on the children by Centre personnel was conveyed to schools to assist them in individualized programming. Since there was little or no follow-up to see whether the recommendations were carried out, it was not possible to evaluate the benefits of the diagnoses conducted at the Centre. In order for the test results to be of much value, planning and implementation of remedial programs was necessary. It became clear to Centre personnel that more was needed than diagnosis alone.

In response to the observed need for remediation services, the remedial component of the Unit was established in 1972 by Dr. Marie O'Neill. Its purpose was to serve as a resource to educators in assisting children with learning disabilities. These two components acted separately, but cooperatively, as the Learning Centre until 1973 when, at the request of the Department of Education, they were merged into the Diagnostic and Remedial Unit (D & R Unit) under the direction of Dr. O'Neill. The new D & R Unit was set up primarily as a service to schools and the community in providing help for learning disabled children. In 1988, under its present director, Mrs. Barbara Hopkins, the Unit continues to provide this service to children, parents and schools in a variety of ways.

1. It provides diagnosis of learning difficulties and remedial services. Children are referred to the Unit from all parts of Newfoundland and Labrador. Some are seen for diagnostic purposes only; others are seen for assessment and program planning, which is then carried out by school personnel. Many children also return for remedial teaching. The length of time that a child spends at the Unit varies with the severity of the problem, the dependability of transportation, the interest of parents, and the capability of the school to establish a program to meet individual needs. The Unit continues to receive 200 requests per school year for services and, therefore, has

a long waiting list of children needing diagnostic assessment and individualized remediation.

2. It provides inservice workshops for teachers on the diagnosis and remediation of learning disabilities. The facilities are also used as a site for teachers in training at the University to do their practicum course in Special Education.

3. It provides inservice training for parents through group sessions and presentations for organizations such as the Parent Teacher Association (PTA) and the Newfoundland Association for Children with Learning Disabilities (NACLD). Many parents attend weekly sessions at the Unit to view their child working with an instructor in order to gain the skill and confidence that will enable them to assist their child in coping with the learning disability. Also, in cooperation with the University School of Social Work, the Diagnostic and Remedial Unit offers ongoing family counselling when such a service appears necessary. This has been a valuable asset to the Unit since the family's coping style can greatly affect the learning disabled child's progress.

Diagnostic Procedure

Diagnosis at the Unit to assess a learning disability follows a general method which usually includes the following.

1. An interview is conducted with the child's parents in order to obtain detailed descriptions of the child's specific learning disability symptoms, behavior in the home environment and the coping strategies employed by the parents in handling the child's problems. The parents also view the testing session through two-way mirrors and complete a written information questionnaire regarding family background and relevant past history of the child relating to developmental progress from birth onward, severity and treatment of learning disability, and social and emotional adjustment.

2. A written commentary is obtained from school personnel indicating the reason for referral, results of testing already conducted, and any relevant information about the child in the classroom situation that the teacher can provide.

3. A casual general discussion is held where the child is asked to explain what reading means, tell what is most enjoyable in school, indicate where the greatest problems lie and explain how he/she would like to be helped.

4. A series of standardized and informal tests are administered in order to obtain; (a) a measure of intelligence and cognitive functioning, (b) a measure of general academic achievement in reading comprehension, mathematics, and general knowledge, (c) a measure of visual memory and eye/hand coordination ability, (d) a

measure of auditory perception, (e) an assessment of word recognition and comprehension ability when oral reading, (f) a measure of vocabulary development and comprehension ability when silent reading, (g) a measure of listening ability, (h) a measure of receptive, expressive and written language ability, (i) a measure of grapho/phonic, syntactic, and semantic abilities, (j) a measure of spelling ability, and (k) a measure of handwriting ability.

Attention is directed to the way in which the child learns most easily, whether by visual, auditory or kinesthetic methods or a combination of some or all of these. Of particular interest is the child's performance during the testing; that is, his/her interaction with the examiner, willingness to try, length of concentration, use of avoidance tactics, perseverance as tasks increase in difficulty, confidence in his/her own ability, the quantity and quality of errors made, and the child's awareness of and reaction to them. By careful analysis of all the data, a pattern of strengths and weaknesses emerges which is used to clarify the nature of the child's problems, and which subsequently forms the basis of the recommendations for remediation.

Individualized Remediation Procedure

Following diagnostic assessment, a decision is made as to whether individualized remedial instruction will be

offered. Considerations for selection follow a designated procedure with the severity of the problem being considered a main priority. The children and their parents should both want to participate in the program and the children should be those whose main deficiency is in reading. Students selected for remediation attend the Unit for a regular one-hour weekly individualized session during the school year.

The methods and techniques of the remedial programs closely resemble those prescribed by Balow (1965) that are implemented in the Psycho-Educational Clinic at the University of Minnesota. They are also similar to those outlined by Bruck (1985) that are practised at the McGill-Montreal Children's Hospital Learning Centre. In all cases the programs are governed by the needs of the student. Attention is directed to the way in which the individual student learns most effectively. Special materials and methods are selected on an individual basis, relative to the needs of the student.

A wide range of current and past materials are utilized including games, puzzles, workbooks, manipulative and magnetic letters, tracing and writing compendiums, popular reading series from Canada, the United States and Great Britain, programmed remedial reading kits, computer programs and selections from children's literature. An eclectic approach is predominant. However, since some of the students are non-readers and many others have severe

deficiencies in word recognition, this area receives major emphasis. Comprehension skills are also considered to be of prime importance during all stages of remediation. Regardless of the simplicity of the reading material, the students are given exercises and practice in understanding word meanings, selecting the main idea, sequencing ideas and events, getting the facts, noting details and drawing inferences.

Children with learning disabilities often experience varying degrees of difficulty in taking in, remembering, organizing and responding to the visual and verbal information in the world around them. Since they do not seem to learn by self-discovery, everything needs to be explicit with considerable overlearning. Theirs is a mystifying, confusing world. Remediation consists of the reduction of uncertainty. Emphasis is placed on providing successful experiences for the students so that many behavior problems can be averted and motivation can be increased. The development of a favorable attitude toward reading and toward themselves as persons of worth is implicit in the program. As the debilitating effects of continual failure are warded off and the students begin to note their own progress, self-confidence begins to grow, self-concepts improve, and their rate of progress noticeably accelerates. An interaction of successful achievement with self-concept enhancement occurs that is mutually reinforcing. Eventually the students' reading

improves and self confidence is built up to the point where they can return to the regular classroom.

When children return to their classrooms full time and cease attending the Unit after a lengthy period of remediation, it is recommended that they should gradually assume the responsibility for independently coping with their school program under the direction of the class teacher. Ideally, a policy of continuous observation should be practised by school personnel and parents to ensure that students' levels of progress are maintained so that they continue to view themselves positively in the learning situation. This is advocated but can neither be implemented nor controlled by the Unit.

Definition of Terms

Children with learning problems are often referred to as learning disabled. While there is considerable disagreement about labelling children with learning problems, for the purpose of this thesis the following terminology will be used.

Learning disability

A specific learning disability has been described by the United States Government as:

> A disorder in one or more of the basic psychological processes involved in understanding and using language, spoken and written, which may manifest itself in an

> imperfect ability to listen, think, speak, read, write, spell, and do mathematical calculations. (Smith, 1981, p. 21)

> Children with specific learning disabilities are a heterogeneous group who, along with many clearly intact abilities, show significant deficits in some areas of academic achievement. Although the predominant symptom is usually learning to read, this may be accompanied by other difficulties such as physical awkwardness, directional disorientation, and the more familiar problems of spelling, math, and written work. The persistent difficulties of these children cannot be attributed to mental retardation, emotional disturbance, sensory or neurological impairment, cultural disadvantage or lack of instruction. (Bruck, 1985, p. 91)

Some definitions cite brain damage as a characteristic of learning disability. In the absence of neurological testing, there is insufficient information to prove either obviously identifiable or inferred central nervous system dysfunction. Therefore, no such impairment is implied in the use of the term learning disability for purposes of this study. A neurological base will be implied only in the sense that all learning is neurologically based. This provision will allow all the subjects in the study to be categorized as learning disabled, and maintain enough consistency to use the terms learning problem, learning disability and learning disabled interchangeably.

Diagnosis

A diagnosis is an appraisal or assessment of a student in order to establish the cause or nature of a learning problem by analysing observed symptoms or distinguishing characteristics.

Remediation

Remediation refers to the treatment measures employed as a means of counteracting or relieving a presenting set of symptoms which inhibit learning. The measures are intended to correct deficiencies and/or improve skills in certain areas of reading.

Self-concept

Phillips and Sigler (1980) have stated that:

> The self-concept is, essentially, a conceptualization or image of the self. It encompasses all that a child brings to the statement 'This is me', including an understanding of his qualities and capabilities and the feelings that accompany these self-perceptions. (p. 112)

In this thesis, the above definition, and the following definitions proposed by Quandt and Selznik (1984) will be used.

> Self-concept refers to all the perceptions individuals have of themselves; especially emphasized are individuals' perceptions of their value and ability. There are two aspects of self-concept about which most psychologists appear to agree:
>
> 1. The perceptions of self that individuals have include their views of themselves as compared to others (self-perception); their

views of how others see them (self-other perception); and their views of how they wish they could be (self-ideal).

2. The perceptions of self that individuals have are largely based on the experiences they have had with those people who are important to them (significant others). Thus, such people can effect change in individuals' self-concept.

Good self-concepts

> Good (positive) self-concepts are ones in which individuals perceive themselves as capable and/or important and, therefore, able to perform at normal or superior levels. In terms of reading, this is a set of self-perceptions that in no way interferes with reading ability or with ability to learn to read. It may, in fact, enhance the person's opportunities to learn to read well. (p. 1)

Poor self-concepts

> Poor (negative) self-concepts, on the other hand, are ones in which individuals perceive themselves as incapable or unimportant to such an extent that they are unable to perform at normal levels. Related specifically to reading, this is a set of perceptions that interferes with reading ability or with the ability to learn to read. (p. 1)

Limitations of the Study

It was decided to conduct the present study in order to provide research evidence to support or negate the conviction that short-term gains resulting from remedial reading instruction are maintained over time. It is readily possible to cite many individual cases to prove

the success of remediation over the short-term, since the immediate post-instruction results are recorded in the students' files. However, while it is believed that long-term benefits are also derived, no attempt has previously been made to evaluate systematically the academic, occupational, social and emotional status of the students served by the Diagnostic and Remedial Unit over a long period of time. While it was recognized from the outset that this undertaking would not be easy to carry out, it was nonetheless considered to be a worthwhile project and one for which a need exists.

It was decided to use a longitudinal follow-up study approach to secure necessary information to support a series of hypotheses related to long-term outcomes of remediation. Fletcher, Satz, and Morris, (1984) concluded from their research that longitudinal designs are not panaceas for problems associated with the measurements of behavioral change over time. Likewise, Labouvie, Bartsch, Nesselroade and Baltes (1974) believe that "simple longitudinal designs with repeated observations of the same group of individuals may represent...a less than optimal procedure for obtaining valid information on intra-individual age changes and may be misleading..." (p. 288). However, in the absence of a more exact means of measurement, the longitudinal study method was employed but carried out with a clear understanding that in studies of this kind where one is being guided by the findings of

the literature as well as by conventional wisdom, there will be numerous limitations. The following are recognized as possible limitations of this study.

The first limitation was the fact that in a study of this kind it was not possible to conduct an experiment where all the potential confounding variables were controlled for by randomization. In this instance some problems resulted in the selection of the subjects in the study sample.

The second limitation dealt with the data collection process. All data used in the study were obtained from the Diagnostic and Remedial Unit files, the responses to a Parent Questionnaire and the Cumulative Record files of the students in the sample. A list of 107 names was generated. Initially, it was intended to collect data on two groups of 30 students each for purposes of analysis. Difficulties in obtaining responses resulted in a disappointing return of 34 percent (see Chapter 3 for a more detailed explanation). This poor return had an inhibiting effect on the design model because of the sample size.

The third limitation involved a lack of consistency within the sample. Instead of having a random selection of students from the clinic, the sample had to be limited to those parents and students who would co-operate. In the case of one group, those who responded tended to be the most severely disabled and therefore needed the most

help. In the other group, it appeared that those whose problems were less severe and largely overcome, failed to respond. In addition; those responding in the first group tended to be of slightly higher IQ than those in the second group and somewhat less severely disabled overall. This presented a somewhat different picture in terms of findings than would have been obtained with the wider sample originally intended.

The fourth limitation concerned the intervening history of the subjects. Information collected, particularly from the subjects' cumulative files, produced a variable that had to be considered in interpreting findings. It proved to be a significant factor in some instances and was outside the control of the researcher. The school records revealed that both groups had received varying degrees of extra help in terms of quality and quantity of school remedial programming in response to the recommendations of the diagnostic reports from the Unit. This meant that the study was no longer dealing with individualized remediation versus no remediation but instead, individualized clinical remediation versus no clinical remediation. In order to control for this factor, it would have been necessary to have a control group who were purposely prevented from receiving remediation.

The fifth limitation concerned the fact that some of the variables regarding the intelligence of the subjects

and their school leaving marks did not have the same metric. This happened because the researcher was limited to what information was available in the Unit files and in school cumulative record files. Whereas all subjects in one group had received WISC-R testing by the same diagnostic team, the scores obtained for the other group were less stable because some scores came from school sources where there was more variation in the kinds of IQ tests used. For this reason, an exact score is but a crude measure of intelligence. Likewise, the school leaving marks were allocated based on different examinations and evaluated by different markers using different criteria.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

The impetus for this research arose from the writer's growing conviction that an interaction of instruction with self concept occurs during one-to-one remediation that produces long-term beneficial effects on the educational progress of children with reading disabilities. It was anticipated that the improved educational outcomes would, in turn, promote improvements in occupational and social/psychological prospects as well. In order to find evidence to support this contention and to clarify related issues, an extensive review of the literature was undertaken.

In this review an attempt has been made to: (a) clarify the characteristics and the problems of children with learning disabilities; (b) examine self-concept as a construct, with an emphasis on the significance of parental and teacher influence on its development; (c) examine theories and concepts regarding the relationship that exists among individualized remediation, academic achievement, and self-concept; (d) survey studies relating the effects of individualized remedial instruction and length of remediation on school outcomes; (e) review studies examining the relationship between individualized remediation and length of remediation and career outcomes; (f) review studies examining the relationships between

remediation and length of remediation and social/psychological outcomes; and (g) investigate the influence that other factors, notably intelligence, father's occupation and number of grades repeated may have on the outcomes of interest.

Characteristics and Problems of Children with Learning Disabilities

Dolgins, Myers, Flynn and Moore (1984) explain that:

> a learning disability is not easy to pin down or define. It can include a wide assortment of deficits and characteristics, ranging from the specific skills necessary for reading or spelling or calculating to a collection of maladaptive behaviors such as hyperactivity, impulsivity, distractibility, and poor concentration. Few children present all the symptoms associated with learning disabilities, and some who are not learning disabled will exhibit these same characteristics from time to time. In the end, a learning or behavior pattern, no matter how it may deviate from the ideal, is not a disability unless it interferes with the child's capacity to learn. (p. 30)

It has been noticed that learning disabled children have trouble learning despite their normal intelligence because, for some reason, their central nervous systems are delayed in maturing. It is the quantity, intensity, and long duration of immature behavior that make learning disabled children different. Their wide array of abilities and disabilities characterize them as inconsistent, unpredictable, disorganized children who puzzle and often frustrate the adults around them. Because they do not follow the normal pattern of maturing,

they are delayed in developing a sense of order which is the foundation on which future learning is built. Smith (1981) explains:

> They cannot seem to organize what they see, hear, touch, feel, smell, and taste in order to make sense of their environment. They cannot sort out that which is relevant from that which is not. They lack discrimination. The filtering mechanism of the brain is not working properly, and so the mass of sights, sounds, and feelings is coming in unscreened, causing disorder. Because the children register fragments of what is coming in, what comes out is therefore fragmented, disorganized, irrelevant and disordered. They are indiscriminate in reactions and often in statements. Although at times they display a very mature intellect and sensitivity, they are frequently scattered and inappropriate... The term "learning disabled" is appropriate for them as they are disabled by their disorder. (p. 9).

Since the term "learning disabilities" came into use in the 1960's, at least 100 varieties have been recognized by the United States Department of Health, Education and Welfare. Schoonover (1983) believes that learning problems can be narrowed down to four major categories: reading difficulties, language and writing problems, abstract concept formation difficulties, and behavior problems. Golick (1978) groups the learning difficulties that children experience into three major categories: space - time - number disorders, language disorders, and specific dyslexia. For the purposes of this study the major emphasis will be placed on the third category so that only specific dyslexia will be dealt with in detail.

As early as 1896, Morgan noted the existence of a specific reading disability indicated by significant

disparity in reading compared with achievement in other academic areas. He and Hinshelwood (1917) named it congenital word blindness. Some time later, in 1928, Orton coined the term strephosymbolia meaning twisted symbols. Since then, developmental dyslexia, or dyslexia, has become the term used for referring to a learning disability in which reading problems predominate. Because only reading seems to be affected the term "specific" was used. Children with this problem experience directional confusion with reading and writing. They mix up letters that are near mirror images of each other (b and d). They often write letters and whole words backwards, starting from the right hand side of the page and, when reading, they reverse the order of letters in words, making errors like saw for was. Such readers tend to remain slow readers, making many miscues, losing their place on the page and generally finding reading a laborious, tiring process. When spelling, they try to use phonics but they can't seem to tell when a word is spelled correctly or incorrectly. They cannot keep pace with their thoughts when writing, so their stories, essays, and answers to questions are full of errors which they cannot seem to monitor. Children in this group have a tendency toward lefthandedness and mixed eye dominance and to come from families with a history of reading and spelling disability.

Gough and Tunmer (1986) note that there has been a spirited debate as to whether dyslexia constitutes a medical disorder with a neurological basis. Many causes of dyslexia have been postulated, ranging from incomplete cerebral lateralization (Orton, 1928, in Gough & Tunmer, 1986) through dysfunction in intersensory integration (Birch & Belmont, 1964) or temporal sequencing (Bakker, 1972), verbal processing (Vellutino, 1979) to genetic linkage (Smith, Kimerling, Pennington & Lubs, 1983). Evidently in despair of finding a unitary cause, a number of scholars are now searching for subtypes (Doehring, Trites, Patel & Fiedorowicz, 1981).

Some recent research in the area of learning disabilities has detected functional and structural abnormalities in dyslexics' brains. Hluchy (1984) reports that in 1979, Galaburda & Kemper, both Boston neurologists, examined the brains of two dyslexics who had died and found alterations in the cells and cellular structure of the outer layers of the left hemisphere of the brain, the area that controls language. They concluded that the alterations had occurred no later than the first 18 to 20 weeks of fetal life, a time when that part of the brain develops. Duffy (1980, in Hluchy, 1984), one of another group of researchers, reported that using brain-scanning technology he had combined an EEG with a computer to obtain color pictures of the activity in dyslexics' brains as they performed various tasks

involving language. Significant differences were found between the brain patterns of dyslexics and normal children. More research will have to be done before theorists and researchers can say, with any certainty, that the dyslexic brain is different.

Some experts feel that proving organic causes of dyslexia will help children troubled with this learning disorder by bringing relief from the frustration and low self-esteem that they suffer when parents and teachers accuse them of being stupid, lazy or both. Others, however, fear that when children learn their dyslexia is organically based, this knowledge may only add to their negative self-perceptions and feelings of inadequacy and make matters worse. In any event, researchers indicate that they are still far from a breakthrough in discovering the causes of the problem. Galaburda (1979) believes that, in the meantime, early intervention and educational therapy can produce impressive results.

Coming to understand the nature of learning disabilities and acquiring the knowledge and skills to empathize with and provide instruction for children who have learning disorders has been challenging to educators. Sally L. Smith (1981), an educator with over 20 years of experience in this field, has accurately stated the case when she acknowledges that when it comes to handling the learning problems of children, there are no easy answers. Today in Canada there are estimated to be more than one

million school age children of average to superior intelligence with a learning disability. Though the experts disagree on exact numbers, the prevalence is estimated to range from 3 to 40% of the school population (Belmont, 1980; Farnham-Diggory, 1978). Many educators now feel that about 10% of the school population is involved. Boys affected outnumber girls, with ratios ranging from 4:1 to 10:1 (Benton & Pearl, 1978). It is sufficient to say that many of our children have learning disorders and that there are at least a couple in any average classroom.

Teachers and concerned parents have increasingly recognized the need for diagnosis and remediation of learning disabilities and throughout the 1970's they began to make concerted efforts to get governmental attention and to make their demands heard. In Canada, the Canadian Association for Children and Adults with Learning Disabilities was formed. It is dedicated to creating a climate of understanding of the nature and needs of learning disabled children. This and other organizations have been disseminating materials and holding conferences. Seminars, workshops and the media have increased awareness in the general public of the problems of these children in obtaining an education.

In 1975, in the United States, congress passed Public Law 94 - 142, requiring states to provide a free, appropriate public school education for all children with

educationally handicapping conditions, including learning disabilities. The act mandated that each handicapped child be educated in the least restrictive environment, appropriate for his or her needs. Most schools have interpreted a "least restrictive" environment as placement in the regular classroom with special class or resource room help as needed.

In Canada the British North America Act specifies that education is the responsibility of the provinces. The resulting lack of federal direction and funds has probably severely hampered the treatment of learning disabled children in this country. Only Nova Scotia and Saskatchewan now provide mandatory special education classes for the learning disabled. In parts of mainland Canada (mostly in Ontario) there are some special schools for the learning disabled, but these are relatively few. In Newfoundland, some children spend most of their time in the regular classroom but get extra help from resource teachers and tutors. Others are placed in special education settings mainly, going to the mainstream or regular classroom, whenever possible. However, for the most part, here as elsewhere, learning disabled children are presently being educated in regular classrooms without extra attention and there, they often experience defeat and failure.

In 1984, Governor General Edward Schreyer, proclaimed March 5th - 14th as Learning Disabilities Week in Canada.

To mark this event an article was featured in The Evening Telegram, March 10th, 1984, in which the Association for Children with Learning Disabilities emphasized how vital it is that children with learning disabilities be recognized early, at least shortly after entering school. It further stated that if such children are allowed to go without special understanding and assistance they often develop severe psychological problems involving lack of confidence and loss of self-esteem. These develop through inability to cope with school as well as the pressure received because they cannot concentrate or keep up with the group. They become so used to negative results that soon they cease trying and fall further behind. Without help these children simply give up on themselves. Often they become dropouts from school and society.

Self-Concept Development

Phillips & Zigler (1980) have stated that "few aspects of development are as fundamental to children's effective daily functioning and general well-being as is their acquisition of a positive self-concept and the accompanying feelings of personal adequacy and self-worth" (p. 112). The confidence that learners have in their ability to learn is an important aspect of reading achievement. Causes of behaviors and of perceptions are difficult, if not impossible, to identify and measure.

Nonetheless, existing research dealing with self-concept and achievement has produced enough evidence to identify self-concept as a significant factor in all aspects of learning. For this reason all aspects of self-concept relevant to learning disabled children's development have been reviewed.

The words "self-concept" have come to mean, "the self as the individual is known to himself" (Carter, 1973, p. 9). Carter had noted the importance of self-concept as a construct in the theories of many writers (Crow, 1967; Heber, 1967; Lewin, 1936; Rogers, 1947; Snygg & Combs, 1949; Snyder, 1965; Strang, 1957). It was postulated by Cooley (1902), Kinch (1963), Mead (1934), and Sullivan (1959), that a person's perception of himself is the central factor influencing behavior. They saw self-concept as that configuration of qualities and characteristics which the individual feels are descriptive of himself. It was also seen by the majority of these theorists as a phenomenon which is absent at birth and develops through social interaction as the child grows and matures.

The development of self-concept is thought to be in a state of continuous change and modification as it is influenced by the varying social situations and experiences. More recent theorists including Bridgeman & Shipman (1978) tend to accept this early view of how the child is carried from a point of individual isolation to a

developmental milestone of sharing the views of others about the self. They acknowledge that Mead's theory of the "socialized self" is a useful model for understanding the development of the child's self-concept, but note the impact of age as another important aspect of that development. Throughout the preschool years and into the primary grades, many children maintain very positive self-concepts, regardless of their ability and circumstances. They do not seem to internalize the views of others until second or third grade at which time they begin to recognize the importance of school achievement and lower their self-concepts as a result of learning problems. Bingham (1980) notes that preadolescents with learning problems appear to be most susceptible to the impact of the failures.

Researchers have long recognized that the way children feel about themselves greatly influences their ability to learn. Heathington (1980), Quandt (1972) and Schubert (1978) believe there is a strong relationship between the quality of a child's self-concept and his reading achievement, with a good self-concept having a positive effect, and conversely, a poor self-concept producing a negative effect. The literature seems to suggest that negative self-concept must be dealt with in trying to change achievement and behavior. Part of dealing with negative self-concept is gaining an understanding of its causes. Since it has already been

accepted that the child's self-concept takes form and shape within the social context of family and educational settings, and that the challenges, evaluations and interactions with parents and teachers leave an indelible impression upon children's evolving self-opinions and feelings (Phillips & Zigler, 1980), attention will necessarily have to focus on socialization research in these areas.

Parental Influence on Self-Concept Development

Research consistently indicates that parents exert the greatest influence over a child's self-concept. They are the first "significant others" in the child's life and they transmit to the child from birth onward the attitudes prevalent in their environment. Quandt & Selznick (1984) agree and suggest that:

> The views that these people appear to hold are revealed through their reactions to children's behaviors, through their approval or disapproval, acceptance or nonacceptance, love or lack of love, and through other rewards or punishments. From a very early age, children learn two concepts from such reactions: how competent they are in activities which are deemed important by people significant to them and how valuable they are as individuals. (p. 3)

Most parents in today's society, irrespective of socioeconomic status, value education and want their children to do well. They do not always realize, however, that in their interaction with their children and their structuring of the home environment they either facilitate or constrain their children's educational development and

future prospects. In particular, they communicate the importance they attach to reading through the provision of reading materials and participation with their children in reading related activities and in this way influence their children's attitude toward reading.

One aspect of the child's developing self-concept said to be related to different child rearing practices is the motivation to achieve. In some way not entirely clear to researchers at present, parents influence their children's expectancy for success and the value they place on attaining it. In an article on current trends in achievement and motivation, Wigfield & Asher (1984) refer to studies that attribute success and/or failure in academic tasks to four factors - ability, effort, task difficulty and luck. Of these four, ability attributions are considered to have the greatest impact on the self-esteem, with individuals tending to feel best when they attribute success to ability and worst when failure is attributed to lack of ability. Under normal circumstances children are resilient and take the occasional failure in their stride believing that increased effort will be rewarded with success. However, children with learning disabilities tend to lose this resiliency in the face of repeated failure and without reassurance of their ability they come to perceive themselves as failures. It is when they sense their parent's lack of confidence in their ability to do learning tasks that negative self-concepts

are formed. Silvernail (1981) contends that the care children receive in the early years prior to attending school establishes their core self-image. In effect, this means that children are already predisposed to success or failure when they come to school.

Teacher Influence on Self-Concept Development

Upon school entrance children meet with the next "significant others" and the emphasis gradually shifts from the parental influence to the teacher and the influence of the school environment. Woodlands & Wong (1979) have expressed the view that children are exposed to the school system during the most important periods of their physical, social and psychological development. They contend that the school provides a dual curriculum which is both implicit and explicit and that the interaction of these two affects both the external and internal experiences of the student. The explicit curriculum consists of subject matter. The process of knowledge is taught and the mastery of the curriculum can be measured in a variety of ways. The implicit curriculum consists of communicating to the student his/her position in the academic and social setting of the school in relation to peers. It is more difficult to observe and evaluate, however, it is the implicit curriculum which contributes the most to the student's perception of "self". Hawk (1967) stated that "regardless of the amount

of knowledge imparted, education has failed when selves of pupils are inadequate, defensive, and characterized by a general feeling of incompetence in what matters to them" (p. 12). With the realization of the critical role played by the self in behavior and learning, concern over the self-concept of students has become a major issue among school people. Of particular significance in this concern is the crucial influence of the teacher-student relationship.

Wigfield & Asher (1984), in conceptualizing social and motivational influences in school, contend that the way teachers interact with their students exerts a significant influence on students' achievement in reading and motivation to achieve. They refer to reviews of the extensive literature on the topic of teacher expectations (Brophy & Good, 1974; Cooper, 1979; and Dusek, 1975) which indicate that generally speaking, teachers have preconceived notions favoring the educability potential of white, middle-class students. Their expectancies of student performance are formed from their own initial attitudes combined with behavioral observations obtained from working with students over a period of time. Results of studies by Good & Brophy (1977), Good, Cooper, & Blakely (1980), Parsons, Kaczala, & Meece (1982), and Weinstein (1976) have shown that teacher expectations are sometimes translated into teacher behaviors involving differential praise and criticism. For example, students

for whom teachers have high expectations get more praise, are called on more often to answer questions, receive more classroom privileges, and are allowed more time to think before answering questions. Students develop awareness of differing teacher treatment and adjust their perceptions accordingly.

The evidence appears to indicate that either consciously or unconsciously, teachers do influence the self-concepts of students. The indications are that the more positive a child's perceptions of the teacher's feelings, the better is the academic standing of the child and the more desirable his/her classroom behavior. On the other hand, Black (1974), Gever (1970), Moushow (1975) and Sebeson (1974) have all demonstrated the reluctance of students to attempt activities which previously brought failure and resulted in negative feedback from teachers. Consistent negative judgments will result in a correspondingly negative self-concept (Andrews, 1971; Beare, 1975; Senf, 1976). Snyder (1965) summed up what is generally felt to be the most worrisome feature about the teacher-child interaction and self-concept when he suggested that teachers may unintentionally, through their behaviors and attitudes toward students, modify the self-images of students in a manner that is detrimental to satisfactory school achievement.

Dweck (1975) and Quandt & Selznick (1984) are concerned with the consequences of repeated failure

on children's achievement motivation and behavior in the area of reading. Quandt & Selznick refer to a spiraling process where development of negative self-concept interferes with learning to read and the resulting reading disability leads to an even poorer self-concept. They state that "children may become victims of a self-fulfilling prophecy. Believing that they will not succeed in reading, their behaviors and efforts during reading instruction contribute to making their expectations come true" (p. 5). Dweck defines this situation as learned helplessness, which is a perception that failure cannot be overcome. Butzowsky & Willows (1980) conducted a study which confirmed that poor readers do exhibit learned helplessness in the face of failure. This condition is accompanied by high anxiety since children do not want to be regarded as incompetent in the eyes of their peers. When students become convinced of their inadequacy as readers, they frequently resort to a variety of avoidance techniques. These include trying to disguise lack of ability by appearing to make no effort, denying the importance of reading activities and/or showing apparent hatred for reading. Instead of helping the situation, these behaviors only tend to make matters worse.

Inability to read is socially unacceptable. As Wigfield & Asher (1984) point out, researchers have found that slow-learning children and low achievers tend to be less popular and among the least accepted children in the

classroom. They refer to a study by McMichael (1980) which indicates that boys who are both poor readers and lack social skills tend to be accepted only by other boys with similar academic and social problems. These children form groups within the classroom and as a result are likely to become more and more alienated from school. Chapman & Boersma (1979) caution against excessive teacher criticism warning that children who initially form specific negative reading self-concepts may generalize their feelings to other facets of the school situation and form a global negative view of self.

Behavioral and social problems such as those outlined are found to occur more often in learning disabled than in normal children. Primary among these seem to be conduct problems (Douglas & Peters, 1979; Kinsbourne & Caplin, 1979; Rutter, 1978). School phobias, depression, and low self-esteem may also be seen in greater frequency in children with learning problems (Balow & Blomquist, 1965; Boder, 1973; Cummingham & Barkley, 1978; Peter & Spreen, 1979; Rutter et al., 1976). There seems to be a consensus of opinion in the literature that learning disabled children have a low self-concept because they are aware of their academic failures and frustrations (Houck & Houck, 1976; Woodlands & Wong, 1979).

Barkley (1981) contends that many of these children with learning disabilities who have acquired poor self-concepts begin school as highly motivated students who

eventually lose interest in academic material after several years' experience of classroom failure. They may often become significantly anxious or depressed by the end of elementary school. Silvernail (1981) concludes that the literature has made it abundantly clear that teachers play a vital role in determining children's self-concept and stressed the importance of their becoming cognizant of this fact and consciously searching for ways of building positive self-concept in their students.

Individualized Remediation - Its Impact on Achievement and Self-Concept

Although there have been advances in identifying learning disabilities and, particularly in the case of reading, describing and classifying symptoms, there remain many unanswered questions as to causes. In the 1980's the debates still go on and the studies continue. What educators do agree upon is that learning disability symptoms must be recognized early and suitable programs and strategies planned to meet individual educational needs. What is important is to find ways to teach learning disabled children to do the things they cannot do. Rawson (1974) states:

> No matter how completely we accept him, a child cannot accept himself as a fully worthwhile, competent, effective person unless and until he gets at least functional mastery over the skills which will permit him to do what he wants to do. This competence is the only solution to the sense of inferiority, and all it leads to in

> personal and social waste, unhappiness, and often tragedy in modern literate, technological cultures such as our own. Somewhere he must get the skills of school. "I am", the child needs to be able to say, "What I can make work". (p. 72)

Heathington (1980) agreed that one of the most vital of these skills of school is the ability to read. From pleasure in leisure time to basic skills of survival, reading affects all phases of an individual's life and guides his/her cultural interactions. Since reading proficiency is demanded for effective citizenship, it is considered a necessary goal for every student in school. The school is instrumental in the process of attainment of that goal. Children soon realize when skills in reading are not sufficient to satisfy their need to know, and when they fail to meet school goals, do not blame the school but merely form negative opinions of themselves as students. It is now widely accepted among educators that later academic successes and life adjustments of students will be achieved only if they acquire positive feelings and perceptions of themselves in the early years. It is essential therefore, to ensure that special attention be given to children where needed to overcome negative feelings and attain necessary reading skills; hence the need for remediation. Depending on the severity of the problem, the remediation may have to be individualized. The remediation is provided in the hope that children will be able to achieve higher levels, graduate from high school, and go on for higher education.

Remediation of diagnosed problems should begin as early as possible because it is believed that the sooner it is provided the more beneficial it will be. Keeney & Keeney (1968) showed that when diagnosis was made in the first two grades of school, nearly 82% of reading disabled students could be brought up to their normal classroom work compared to only 10 to 15% of those diagnosed in grades 5 to 7. Studies by Bloom (1964) and Caldwell (1968) have shown that children are likely to be more responsive to remediation during that period in which the brain is maturing and when behavior is less differentiated (ages 2-10). From ages 11-16 years repeated academic failure takes a greater toll. Once children become "turned off" from reading, it becomes difficult to establish enthusiasm for the remedial program that is considered necessary to guarantee successful results.

Central to the provision of individualized remedial instruction is that education be viewed as a process that can significantly influence children's development. Clinicians who deal with children with reading disabilities often describe them as having suffered from loss of self-esteem from repeated failure in regular classrooms. They are children often several years behind their expected reading level who are very much turned off from reading, whose stomachs become upset, whose heads ache and who yawn uncontrollably when asked to read. Their lack of confidence and spontaneity depict an image

of defeat. As educators, clinicians must be able to look beyond the children's presenting behaviors to the possibility of future growth, confident that transformation can take place with appropriate instruction and structuring of the educational environment.

The immediate aim of a clinical remedial program is to replace defeat with success. Sometimes removal from the failure setting of the classroom is a necessary first step. In this regard, Wigfield & Asher (1984) agree with Resnick & Robinson (1975) that it is vitally important for children struggling with reading to experience as much success as possible during reading instruction in order to become better achievers. They also refer to a study by Dweck (1975) which indicates that even learned helplessness can be overcome through provision of successful experiences and basic skill training. Beane (1982), Combs (1982), Maehr (1969), Purkey (1970), and Rieger (1975) agree but contend that initially the priority should be on success, particularly in the case of older children who have suffered more from the debilitating effects of failure. Artley (1977) suggests that many remedial reading programs do not succeed because they fail to recognize the importance of overcoming damaged self-concepts. Those that do succeed do so, instructors are convinced, because of the interaction between instruction and self-concept enhancement that is occurring. Clinicians have observed that children having

only one hour of individualized instruction weekly, often in less than a year make gains that simply cannot be accounted for in terms of instruction received alone. In their new found eagerness to read, to attack unknown words without anxiety, these children also walk and talk more confidently, their whole demeanour reflecting their new impression of themselves. Silvernail (1981) summarized the mutually reinforcing interaction that operates between achievement and self-concept as "a two-way street, in that successful achievement leads to higher self-concept and, in turn, higher self-concept leads to greater achievement" (p. 33).

Samuels (1977) states that "The key to any behavioral change, whether it be in the cognitive or in the affective domain, is to diagnose children's specific weaknesses and strengths and then to use appropriate procedures to move them to more adequate levels of functioning" (p. 42). In remedial teaching, considerable attention must be directed toward identifying strategies that will increase academic achievement. There will necessarily be variation for individual needs but there are some basic principles that are generally accepted. While it may seem logical for the instructor to provide disabled readers with the skills they are missing, it must also be recognized that placing emphasis on the weak areas and continuing to use teaching approaches that have already proven fruitless for those children is unlikely to be successful. It appears to be

wiser to build on strengths and remediate the weak areas incidentally.

Silvernail (1981) has found that researchers on the topic of remediation repeatedly refer to the importance of teacher enthusiasm and stress the necessity for teachers to maintain a strong academic focus. Facets of the direct instruction approaches advocated by Rosenshine (1979) and the mastery learning techniques of Bloom (1976) are considered to be effective. Instruction in word identification, comprehension, and vocabulary development involves clear presentation of material in manageable learning units that the students can master. Activities should be selected and learning experiences planned to show students that skills are improving and progress is being made. Frequent questioning and controlled practice guarantee maximum time and attention on task. The teacher's calm accepting behavior coupled with supportive encouragement and praise ensure that the sessions are a stimulating and pleasant experience for the student. It is also considered important that the individual child's interests be discovered so that both the format and content of books and other visual materials used in instruction can be selected appropriately.

In order to maximize the effectiveness of individualized remedial programming, a parent-teacher partnership should be developed. Teacher initiative in inviting the parents to view sessions and discuss relevant

issues can bring about greater understanding of their child's problems and help parents develop more effective coping strategies. Instead of trying to teach reading skills they will be advised to spend time at home in such activities as encouraging sustained silent reading of child selected material, playing reading games, reading bedtime stories and casually discussing books, words, and ideas. They should also see that their children become members of the public library. By working together the two "most significant other" groups can bring about positive changes in both attitudes and achievement.

In their efforts to help, both parents and remedial teachers should guard against pressuring children to reach prescribed levels by a specific time. Bloom (1976) insists that children must be allowed to move at their own pace and be given sufficient time to grasp each sequential step in skill mastery. Dweck (1975) emphasizes the importance of continuing the remedial instruction until such time as children can change their attributions of failure to lack of effort and other nonability factors. The length of treatment is significant in restoring the lost resilience to failure and encouraging children to try harder. In providing the kind of learning environment recommended by Swayze (1980) that is supportive, caring, positive, and growth promoting, clinicians are able to reverse the negative spiraling process and replace it with a positive one as described by Quandt & Selznick (1984):

> If successful in extracting ideas from the printed page and if the people important to them enable the children to recognize their success, they will develop concepts of themselves as "readers". As a result of such successes, children will attempt more difficult material, take more pleasure in reading, and be apt to read more widely. The wide reading makes children better readers. As children recognize their improvement and people important to them notice, children's concepts of themselves as readers are enhanced and the cycle continues. (p. 5)

Relationships Between Remediation and School Outcomes

The literature reported a growing awareness that the self-concepts of learning disabled children can be improved with lasting effect when it is realized that improved school achievement must come first. In programs where this has been recognized, the results of remediation efforts have been encouraging. Since the Elementary and Secondary Education Act (ESEA) was passed in 1965, the United States Department of Health, Education and Welfare (DHEW) has been providing funding sources under Title I, Title II, and Title III categories that have enabled educators to conduct many innovative educational projects throughout the United States during the 1970's and 1980's. Through these projects much is being done to alleviate the problems inherent both to individuals and society in general from reading disability. Some comparable endeavors have been recorded in Canadian centres also as is evidenced in the studies reported in this review.

Short-term Remedial Projects

The Broward County School Board, Fort Lauderdale, Florida, participated in a Title I remedial reading program during 1968-69. A Reading Center was established as part of the Reading Program in the Elementary schools. The Center program was specifically designed to help the students who were disabled readers. Individual students began intensive reading instruction on a one-to-one basis with a reading specialist. After each had attained a designated level, he joined another student for remedial instruction. At a later date when he reached another designated level, he entered a small group of 4 or 5 students. The treatment period lasted 7 1/2 months with sessions every second day.

Thomas M. Banks, author of the Research Department Follow-up Study (1970) reported that most students enrolled in the Reading Center, by the very nature of their reading disabilities and their past experiences of failure and frustration, did not view themselves in a very positive manner. They often had feelings of not being liked, wanted, accepted or appreciated. Many had feelings of inadequacy because they felt they lacked the ability to meet the expectations that were held for them by the significant other persons in their world. The Reading Center program was designed so that all of the reading experiences were successful for each learner. Tasks were

planned so that the student began to feel that work and learning could be a satisfying and valuable pursuit. In this way, students began to see themselves in a more positive light.

This study looked at the amount of retention after one year of remediation. The subjects were 47 experimental-group fourth graders who attended the Reading Center and 48 control students with Otis IQ scores similar to the experimental group who were designated in need of remedial reading instruction but did not receive any. Both groups were administered the Gates Word Recognition Test and the Gates Paragraph Reading Test before and after the instructional year. The experimental group made significantly higher gains than the control group in both word recognition and paragraph reading. The results of the Comprehensive Tests of Basic Skills, administered to all fifth and sixth year students, showed that the experimental group was still significantly higher than the control group in both word recognition and paragraph reading. This result was viewed as not just a temporary improvement.

Rawson (1974) recounted the efforts of the Diagnostic and Prescriptive Child Learning Center for Children with Specific Learning Disabilities, Howard County, Maryland. Their program operates an interdisciplinary diagnostic service for any county pupil (kindergarten to grade 3) referred through Pupil Services. As an additional

service, the teaching staff of the Center visit three different county schools each year in order to train teachers in diagnostic-prescriptive teaching and establish specially equipped resource rooms to serve the needs of learning disabled pupils in their own schools.

In each of the participating schools, eligibility to the Child Learning Center Resource Room program is restricted to those children who have average or above average intelligence, but who are experiencing difficulties in mastering the basic skills of reading, writing, spelling, or arithmetic. A major focus is to help school personnel identify learning disabilities early in the school experience and to set up remedial programs of instruction to correct the problems and to offset the results of accumulated failure among bright children. Resource Room services provide at least forty-five minutes of special instruction each day, five days a week for each child. Most (but not all) children respond well to this kind of educational management. Regular teachers are involved in the total instructional management plan and, by observing lesson demonstrations, and participating in school workshops, they become cognizant of the special efforts (methods, techniques, materials) used in the Resource Room.

The preliminary research findings on a population sample of ninety-eight learning disabled children in kindergarten through third grade who received Child Study

Center Resource Room service between pre and post testing show that for six months of Child Study Center teaching, a gain of six months or more was found in word recognition, spelling, and arithmetic fundamentals. The preliminary report suggests that learning disabled children who receive diagnostic-prescriptive and remedial service while remaining in the mainstream of education can make significant academic progress.

Another similar program, a Canadian project, was evaluated by Finch (1977). In the belief that serious disabilities with their accompanying social and emotional problems can often be forestalled, the Edmonton Public School Board established an Elementary Language Arts Assistance Program (ELAAP). The program was designed to provide small group tutorial instruction to learning disabled students within their own schools. Children chosen for Resource Room help were in Grades 1 - 4 inclusive. The instructional program in Language Arts covered the areas of reading, oral and written language, spelling, listening and viewing. Basic reading skills received primary emphasis, and featured an eclectic approach with stress on phonics. Efforts were made to ensure that learning activities were associated with success.

The evaluation findings indicated that significant gains were made by the children, particularly in basic reading and spelling, but that generally they were still

below grade level. Both resource room and classroom teachers saw the greatest changes in the children's confidence in their ability to succeed in classroom work and activities, and in an improved self-concept and interest in reading. The greatest improvement was seen in grade 2 students and the least in grade 4 students. Clearly early remediation of difficulties was seen as being most successful. Of the 2314 students enrolled in the 60 schools in the sample, between 660 and 900 were expected to be ready to return to the regular programs in the fall of 1977/78. The general impression was that the ELAAP program had been viewed positively by principals, classroom teachers and parents and the recommendation was made that it be continued.

A particularly industrious and innovative project was awarded Title III funding in the Colorado Springs Public School System, Colorado (1974). A United States Air Force Academy in El Paso County developed the PARADE project (Projects Advancing Reading Achievement and Developing Ego-Strength). The program was designed to quickly identify and diagnose reading problems in elementary and secondary level students as they entered the new school and to arrange placement so as to provide an intensive program of prescriptive teaching. They also aided the students in the development of their self-concept by encouraging conviction of their worth as individuals and as members of society. Dr. Joan Stokes, Director of

PARADE, insists that one element which must be common to prescriptive training classes is that of assuring at least one daily opportunity for each child to enjoy the satisfaction of earned and rewarded success.

The objectives of the project were that, by the end of one year, 75 percent of the students remediated would be able to go back to the regular classroom with their reading achievement at a level no more than two months below grade level and their self-concept score above the 20th percentile as measured on the Parade Learner Self-concept Inventory. There also had to be observable indications of improved class behavior. The evaluation reveals that 70 percent actually went back to the regular stream with some leniency being permitted only on the level of reading achievement reached.

Edwards & Ellis (1973) reported on the effectiveness of the Vancouver School Board Reading Centre Program which operates as a treatment centre for children who are severely delayed in reading and also as a demonstration centre for the in-service training of teachers. The centre also serves as a support unit for the many Learning Assistance Centres which have been established in Vancouver Elementary Schools since 1971. The objectives of the program are: (a) to provide the pupil with a warm, protective environment where he is free to progress at his own speed without undue pressure and competition; (b) to give each child as much individual attention, and

counselling as possible; (c) to place the pupil on an academic program that fits his/her needs and to provide a series of successful experiences at his/her level of competence; (d) to give the pupil an intellectual understanding of the reading process; (e) to imbue a thorough knowledge of the phonic code; (f) to increase sight vocabulary; and (g) to create a solid foundation on which the pupil can build reading skills, (h) to assure that each pupil is capable of reading independently at some level of competency in order to ward off the debilitating effects of continual failure.

In a personal communication to the writers, Mr. Donn Barrieau, the reading coordinator, outlined the basic procedure followed at the Centre:

> The content of each child's program consists of science, social studies, art and physical education....The children are on individual programs of study whenever possible during the first term to accommodate their different achievement levels, methods and rates of learning. During the second term an increasing amount of time is given to group activities and short formal lessons in social studies and science. Halfway through the year, children who are able to succeed in a subject (e.g., art) taught in a regular classroom situation are given the opportunity to do so in the nearby Carr Elementary School. Thus begins the careful transition back into the classroom. (p. 2)

Pre- and post-treatment data collected from teacher assessment of pupils' academic skills and behavioral characteristics showed that students had improved in visual and auditory perception, phonics skill, and both oral and silent reading and recall. The progress of

former students of the VSBRC after returning to regular classrooms has been very encouraging.

The studies reported are representative of many with similar programs. One finding that clearly emerges is that academic achievement improves significantly, over the short term, when specific measures are taken to provide remediation for reading problems. The review of the literature indicated that the question as to whether short term gains are maintained over time to improve long term school outcomes has been studied very little.

Generally speaking, the findings of longitudinal studies that are available indicate that the educational outcomes are poorest for those whose disabilities are most severe, and that prolonged remediation is necessary in order to improve long-term prospects.

Long-Term Follow-Up Study Reports

Two British follow-up studies by Lovell, Byrne, and Richardson (1963) and Johnson & Platts (1962) showed that reading disabled students did make substantial short term gains and continued to progress after remediation had ceased. Despite the immediate progress, within two years they had fallen behind their classmates again because their rate of progress was slower than the rate for normal readers.

Balow's (1965) four year follow-up study findings were that severely disabled students of average

intelligence who received clinical remediation at the Psycho-Educational Clinic at the University of Minnesota surpassed the normal growth rate of normal pupils (one month growth in reading skill for one month in school) by five to six times during the instructional period. In the four year follow-up period after termination of sessions, those children who received no further special help maintained the skill level they had acquired but did not progress further. Those who were given some minimal supportive help during the same four year time interval continued to develop at a rate of 75 percent of normal growth. Balow concluded that, while severe reading disability is ameliorated by short-term intensive remediation, it is not eliminated. Supportive help is still necessary following termination of clinical treatment.

Balow's findings were consistent with those of other investigators of that period including Silver & Hagin (1964), Carter (1964), Howden (1967), and Hardy (1968). More recent studies by Boder (1973), Satz, Taylor, Friel and Fletcher (1978), and Trites & Fiedorowicz (1976) also indicate that deficits in reading persist through adolescence and often into adulthood. Studies by Faford & Haubrick (1981), Frauenheim (1978), and Gottesman (1979) take the viewpoint that there is no relationship between amount of reading help received and adult reading outcomes, and that plateaus are reached that make further

progress very difficult for the severely disabled. However, the majority of the other investigators believe that intervention is very important and that the success of short-term remedial efforts warrants the maintenance of remedial treatment over a long period. They agree with Balow (1965) when he suggests the possibility that intensive remedial instruction continued over years might enable severely disabled readers to make normal progress in school.

Robinson & Smith (1962) conducted their study to challenge the hypothesis which held that pupils who are delayed in reading never become competent readers. In 1958 they conducted a follow-up of 44 students seen first in the clinic of the University of Chicago in 1948. Eleven of them had been seen for diagnosis only. One of the major questions of the study concerned the school progress made by each subject. The findings revealed that only three of the 44 subjects did not complete high school. Eleven were still college students in 1958, three had received master's degrees, and two of these were enrolled in doctoral programs. One subject had completed medical school and was an intern. More than half the subjects had already completed college and three quarters were expected to graduate. The conclusion was reached that able students with reading disabilities can be remediated sufficiently to obtain a formal education. In

this study "able" by definition, referred to clients with a mean IQ of 120.

Preston & Yarington (1967) in their review of previous studies noted the favorable prognoses of the Robinson & Smith (1962) and Rawson (1968) studies of the intellectually gifted disabled readers. They also cited the Balow & Blomquist (1965) study to demonstrate that many problem readers of significantly lower intellectual capacity can also make educational progress. Information regarding the progress of 32 male adults who had been delayed readers as children 10 to 15 years previously, indicated that most of the subjects whose IQs ranged from 91 to 110 (mean = 100) had graduated from high school and had attended, or were currently attending, college or other post-high school educational institutions. Preston & Yarington also reported on the Balow (1965), Lovell et al. (1963), and Silver & Hagin (1964) studies earlier cited in this review, which concluded that reading disability is a long-term problem with negative symptoms still detectable in adulthood. They maintained that it was difficult to draw definitive conclusions concerning eventual educational outcomes of the problem readers from all the studies reviewed because of the absence of comparisons with the subjects' peers from the general population.

Preston & Yarington designed their own study so that its data, based on a sample of typical cases of reading

problems, could be compared with parallel data from a control group representative of the general population. Their follow-up study of 50 problem readers consisting of students mostly of average ability (mean IQ = 97.6) was made eight years following diagnostic assessment at the Reading Clinic of the University of Pennsylvania. Each subject had received several sessions of diagnostic teaching at the clinic in addition to their assessment. Twenty-nine also had remedial instruction at the Reading Clinic, 17 had received remedial assistance elsewhere, and four had no remediation. Evidence from the findings was mixed, but it verified the hypothesis that disabled readers after a span of eight years fulfill educational goals comparable to those of their age peers in the general population. The subjects' rate of enrollment in high school and their rate of success in graduating from high school conformed to the national rates as did the proportion of dropouts from elementary and high school. Almost as high a proportion of the group gained admission to college as in the general population.

The educational progress of the study students, however, occurred more slowly in that most had repeated one or more grades in their passage through school as compared to only one-sixth of the general population. None pursued or had plans for pursuing professional or other graduate study. Based on the findings for the relatively small number of subjects in the sample, it was

concluded that in slowing educational pace, a reading disability tends to limit academic aspirations and ultimate academic achievement.

Bruck (1985) summarized a review of the literature on long-term studies by stating her concerns that:

> ...while results of existing studies suggest that learning disabilities persist throughout adolescence and adulthood, these data do not yield a comprehensive picture of the specific long-term consequences of learning disabilities, of the long-term effects of various treatment programs, and of the types of children who, as adults, will suffer the most long-term handicaps. (p. 95)

Her study, based on these concerns, was conducted at the McGill, Montreal Children's Hospital Learning Centre. The academic, occupational, social, and emotional status of 101 late adolescent and young adults who had been diagnosed as learning disabled during childhood was assessed and compared to a control group of 50 non learning disabled peers. They were also compared to a second control group of 51 siblings of the learning disabled group who were matched with the learning disabled subjects on the basis of age, sex, and socioeconomic status, but had no history of learning disabilities.

A breakdown of the severity of the learning disabled group indicated that 43% of the subjects were in the severely disabled range, 31% were in the moderate range, and 27% were mildly disabled. Although only half the learning disabled subjects had received clinical treatment for at least one and a half years, in all but four cases,

the remaining subjects had received some specialized assistance either in school or from private tutoring. On the average each subject received 4.47 years of special assistance for their learning problems.

Analysis of the data indicated that learning disabilities persisted in that the peer group always performed better than the learning disabled group on reading tests. Nonetheless, additional analyses indicated that, under certain conditions, basic skills continued to improve after adolescence for learning disabled subjects. Those learning disabled subjects who were still students out performed the "working" subjects indicating that skill development continued to improve in demanding literacy environments with the best results occurring in proportion to years of schooling and amount of direct practising of reading and writing skills. While most learning disabled subjects still described difficulties associated with reading, the problems were rarely regarded as a handicap or even a hindrance to their daily functioning. Most felt that they had either overcome or learned to compensate for the childhood learning disability. Test score data confirmed that most learning disability subjects had sufficient skills to function in a variety of situations, and that on the average their reading and writing skills were at the grade 9 level. Only between 3% and 10% performed below the grade 6 level on reading and writing tests, which is considered to reflect low functioning.

In terms of educational achievement the learning disabled group had not received as many years of schooling as the peer control group, but matched the sibling control group. While more learning disabled subjects entered a vocational training school after completing high school, the same proportion of learning disabled and sibling control subjects dropped out of high school, completed the formal requirements of their specific high school program, and continued their schooling after high school. Of those who entered an academic stream after high school, similar numbers of learning disabled subjects and peer controls had completed the program, dropped out, or were still in the program at the time of follow-up. Of the 11 learning disabled subjects who had completed undergraduate courses in university, 8 had gone on to graduate work. Most of them indicated that they found the work load harder for them than for their classmates. They often had to reread texts several times for comprehension and had to ask family members to edit, proofread, and type assignments. Many had taken reduced academic loads thus requiring an additional year to complete their programs. The data also demonstrated that while severity of disability significantly contributed to high school dropout and failure to pursue higher education, it did not impede the chances of success for those who did enter the postsecondary academic stream. In summary, the prognosis

in terms of schooling outcomes for children with reading disabilities was positive.

Relationships Between Remediation and Career Outcomes

Evidence regarding the occupational status attained by learning disabled children compared to regularly progressing children tends to be conflicting. It is generally accepted by most educators that, at present, remediation to ameliorate reading disability in order to improve academic achievement is the best provision that can be made to enable these children to attain a fulfilling life long career and to prevent the problems of unemployment. Two early studies appear to have found favorable outcomes for mentally superior reading disabled children when they reach adulthood. These were determined partially by measures of occupational success.

Rawson (1968) conducted a follow-up study in order to compare the vocational outcomes of 20 dyslexic and 36 non-dyslexic male subjects, 18 to 35 years after initial testing. All 56 subjects had attended a private boarding school in Moylan, Pennsylvania. She found that the learning disabled subjects (Mean IQ = 123) were as occupationally successful as the control group. All 20 of the dyslexic subjects had graduated from high school, 18 from college, and all but 2 were engaged in, or training

for, occupations at the professional and managerial levels.

The Robinson & Smith (1962) study of the status of 44 University of Chicago Reading Clinic Clients 10 years after clinical contact, found that only one subject was unemployed at the time of follow-up. The types of positions that the former clients held varied considerably and ranged from teaching, social work, armed services, farming and business positions to a stockboy in a grocery store. There were also 15 still in college. Most of the occupations or careers were deemed satisfactory to parents of the clients. The general conclusion was reached that "able" students (Mean IQ = 120) who are reading disabled can be remediated so as to fulfill their occupational ambitions.

Balow & Blomquist (1965) interviewed by phone 32 former reading clinic male students who had been diagnosed as severely disabled readers at the University of Minnesota Psycho-Educational Clinic during the years 1948 to 1953. All subjects were within the average range of intelligence. Ten to fifteen years later at the time of follow-up, the interview data indicated that occupationally, the subjects held a variety of jobs, less than half of which were classified as semi- or unskilled. None were unemployed.

Preston & Yarington (1967) concluded on the basis of telephone interviews with 50 former reading-clinic clients

of the University of Pennsylvania that, while learning disabled students require more time to complete education and job training than average learners, their levels of occupational status were comparable to those of the population in general as reported in national statistics. Neither was the rate of unemployment significantly different from that of the national population.

More recently, Spreen (1982) conducted a study that demonstrated that although increasingly negative educational, social, and emotional outcomes are associated with the degree of neurological impairment in learning disabled subjects, occupational levels were similar to the controls. By contrast, other studies have concluded that there are many negative, long-term consequences of childhood learning disabilities, notably poor levels of occupational achievement. Carter (1964) conducted a study of 35 former reading-clinic clients using an eleven-item assessment scale. Results indicated that the learning disabled individual is at risk for low occupational status in adulthood. Hardy (1968) found that most of the subjects in her reading clinic survey were satisfied with their jobs even though they were low level occupations.

Bruck (1985) designed a study to bring some empirical data to bear on current beliefs. Officially it was intended to compare the employment rates and occupational levels of a group of learning disabled subjects with two control groups; a non learning disabled peer control, and

a group of the learning disabled subjects' non learning disabled siblings. Because the peer control was considered atypical of the general population by Statistics Canada (1978) standards, only relevant data from the sibling control subjects and from Statistics Canada were used to evaluate the employment status of the learning disabled subjects.

The subjects' occupational status was classified as "student", "employed" (fulltime job), or "unemployed" (not at school and looking for a job). The occupational level of each subject employed at the time of the interview was rated according to the Blishen Scale (Blishen & McRoberts, 1976). The findings indicated that similar numbers of learning disabled subjects and sibling controls were in the labor force. The unemployment rates for both groups were similar and were comparable to those of Statistics Canada. Most of the unemployed subjects in both groups were late adolescents who had poor educational and employment histories. Forty-five percent of the learning disabled group were high school drop-outs.

In terms of occupational levels, the learning disabled subjects and sibling control had similar Blishen ratings. Bruck (1985) states:

> The occupations of the learning disabled subjects were highly varied and included such professions as social workers, radio installers, mechanics, computer analysts, nurses, accountants, shippers, and dispatchers. Occupational achievement was not associated with severity of learning disability. ...data indicated that, on the whole the learning

> disabled subjects were satisfied with their jobs; most stated that they would like to eventually change jobs to more responsible or skilled placements. Most of the subjects felt that they had the requisite skills to function competently in their occupation... The data do not indicate that a learning disability as such is a precursor of unemployment or underemployment. (pp. 118-119)

Relationships Between Remediation and Social/Psychological Outcomes

The inability of reading disabled children to perform adequately in areas of academic achievement despite average intellectual capacity and educational opportunity is known also to present problems in social/psychological functioning. Many of these children experience frustration and depression from repeated school failure, develop behavior problems, and demonstrate shyness, anxiety, withdrawal, and overdependence which are associated with loss of self esteem. These problems, in turn, contribute significantly to school dropout and juvenile delinquency (Brown, 1978). This topic has been detailed earlier in the section on teacher influence on self-concept development. The literature suggests that both preventive and rehabilitative intervention measures should be based on improving students' academic achievement which in turn will enhance the students' self-concept. All the studies favoring this "skill development theory" which have been reported in this review indicate

not only short term reading achievement benefits, but parallel improvements in self-concept as well.

Improvements that were evident in the affective domain involved more positive attitudes toward school in general, and reading, in particular. Disruptive classroom behavior declined and reduced shyness and anxiety in peer relations was evident. The Parade (1974) program, for example, enabled 88% of the students receiving reading remediation to also score above the program's 20th percentile target goal on the Parade Learner Self-Concept Inventory.

A report from Beekmantown Central School, Plattsburgh City School District, N.Y., describes a study of 13 disadvantaged grade 1 students enrolled in a 4-year remedial education program. The study was attempting to determine program effectiveness in terms of academic skill and self-concept improvement. Those in charge of the project entitled it "Instructional Support: Ego Enhancement for Potential School Dropouts". They based their program on the premise that self-image is a product of an individual's past relationship with his environment and greatly influences his behavior toward future situations. Through prevention of failure, the project teachers hoped to forestall the cycle of events that often leads to school dropout.

A model was developed which used the learning center approach within classroom boundaries. The teacher-

directed education program consisted of a highly-structured, slow-paced teaching method. Materials such as basal readers, language development kits, and audio visual equipment were utilized. There was a parent involvement component, and preservice and inservice training for teachers. The techniques aimed at enhancement of self image, which were incorporated into teaching procedures, might ideally be used in any classroom to good effect. These included immediate feedback, positive reinforcement, on-task performance, proper corrective procedures and scheduling which allowed each child to move at his own pace.

Results obtained by comparing study students with controls from regular grades showed that experimental study students progressed faster in word recognition, attained a significantly higher level of self-reliance and showed a significantly lower incidence of personality and interpersonal adjustment problems. It was concluded by the program organizers that their earlier contention had been affirmed, and that by teaching their pupils to identify with success they had achieved their underlying goal of enhancing the self-image of the study subjects. The positive evaluation of this program suggests that educators should be looking very seriously at early intervention, as prevention may prove considerably easier to effect than cure.

Kahn (1975) performed an evaluation of a New York City School district educational project funded under Title I for the 1974-75 school year. The project was organized to meet the special needs of children who exhibited a wide diversity of deficits that included learning disability. The purpose was to improve the reading, language skills and self-concept of eligible pupils. Three hundred exceptional children from fifteen non-public schools were selected on the basis of residential area and educational disadvantage. Reading was taught to individual pupils either developmentally or remedially with emphasis on readiness, word-attack, and comprehension skills. In addition, the children were provided with speech therapy, creative art, psychological and social work services.

The Peabody Individual Achievement Test was used to assess reading improvement, while a test of their own design was used to measure self-concept enhancement. The report concluded that a mean gain in reading of 11.5 months was attained by the pupils in nine months. The degree of change in self-concept between pre-test and post-test scores was statistically significant at greater than the .001 level.

Kahn and his team gave this project a positive evaluation based on their observations of the one-to-one relationship of teacher to pupil, positive feedback from classroom teachers and parents, excellent test results,

evident progress in terms of pupil behavior, and positive attitudes displayed by the children towards themselves and school. The highest rating was awarded for the overall effectiveness of the program in achieving its purpose.

Although articles by Mauser (1974) and Schenk, Fitzsimmons, Bullard, Taylor, & Satz (1980) indicate a significant relationship between learning disabilities and juvenile delinquency, and other studies reviewed by Bryan & Bryan (1978) have noted the frequency of social and emotional problems in learning disabled children, little information was available on the adjustment in social and emotional domains of learning disabled subjects in adulthood. Most of the follow-up studies reviewed have been limited to adult outcomes in academic and occupational achievement. Spreen (1982) examined adult outcomes of three groups of learning disabled subjects: those with neurological impairment, those with suspected neurological impairment, and those with no neurological impairment. He found that, while all three groups of learning disabled subjects showed more social and personality problems than a control group, social and emotional maladjustments increased with the degree of neurological involvement.

The Balow & Blomquist (1965) study conducted a follow-up of 32 male clinic subjects of average intelligence who had been diagnosed as severely learning disabled in their elementary school years. At the time of

assessment most were judged to have slight negative emotional problems associated with their disability. Although nearly all the subjects had received sporadic instruction in remedial reading throughout their elementary and secondary school years, ten to fifteen years later, most still showed vestiges of their childhood disability in their social-emotional functioning. In this regard Balow & Blomquist concluded that:

> Most of the interviewed subjects did not like school and do not read for pleasure or interest... Few of them gave any credit to agencies, institutions, or teachers for assistance in overcoming their reading disability. Many appeared to have a negative and slightly defeatist attitude about life in general. Only three of the thirty-two are married. They do not appear to feel that they are "masters of their own destiny" but give one the clinical impression that they feel awash in a sea of forces fashioned by others. In general they had only vague plans and goals. (p. 48)

Bruck (1985) compared the social and psychological adjustments of the learning disabled group she had followed from childhood diagnosis into late adolescence and early adulthood with those of a peer control group. The analyses involved comparing the proportion of subjects in each sample that had problems in family relationships, peer relationships, and overall psychological adjustment. The rates of reported problems at follow-up were compared to childhood rates for the learning disabled group. In addition, the relationship between severity of childhood learning disability and social/psychological outcomes was examined.

The results indicated that similar numbers of learning disabled and control subjects had experienced difficuity in their interactions with their parents. Seventy-five percent of the learning disabled subjects with reported problems at follow-up also had problems at childhood and these were not associated with the severity of childhood learning disabilities. Similar proportions of learning disabled and control subjects had peer relationship problems with the same sex but the problems reported by the peer control were "mild" in all instances whereas more than half the learning disabled subjects had problems classified as "moderate", meaning that their degree of shyness was so excessive that they were socially isolated, lonely, and not competent in making friends. While 90% of the learning disabled subjects with problems at follow-up had retained them from childhood, 30% of the subjects had overcome early childhood problems and were enjoying good peer relationships at follow-up. There were no differences in the proportions of learning disabled and control subjects who had infrequent dates with the opposite sex, and severity of childhood disability was not related to this measure.

The learning disabled subjects had significantly higher rates of psychological problems than the peer controls. This was more evident among adolescents than young adults and less prevalent in learning disabled males than females. The learning disabled group exclusively

demonstrated difficulties in terms of controlling temper and dealing with frustration. Severity of childhood learning disability was not related to psychological adjustment at follow-up. There was no indication of improvement in psychological functioning for the learning disabled group during the interim between adolescence and young adulthood, but it was noted that many of the childhood psychological problems disappeared by adolescence so that 53% of the learning disabled subjects were considered to be well adjusted at follow-up. Only a small minority of learning disabled subjects had recent histories of counselling or psychiatry. In most cases the behaviors coded as problematic appeared to be representative of the common difficulties experienced by many young adults or late adolescents in the general population.

Taking into account the general nature of the data on social and psychological functioning, it cannot be concluded that children with learning disabilities are more at risk for having such adjustment problems as adults than non learning disabled individuals. Bruck (1985) noted that her findings are consistent with those of other follow-up, and retrospective clinical studies, reviewed by Robins (1979).

Although most of the follow-up studies concluded that reading disabled students can be rehabilitated educationally so as to fulfil their occupational

ambitions, few studies determined the extent of reading engaged in by these students. The Robinson & Smith (1962) study reported that in general the brighter students were the most avid readers. Of the 44 students examined, 20 students were described as reading more than average while, 11 were reported to read very little or only when necessary. They concluded that problem readers can become avid readers if their problems are corrected by early remedial intervention. The Bruck (1985) study noted that the most important finding in terms of reading skills concerned the relatively high number of learning disabled subjects who rarely read anything for pleasure. Most of the infrequent readers felt well informed about current events and explained that they obtained necessary information from radio, television, friends, or parents. Forty-three percent of the learning disabled group compared with only 12% of the control group did not read for pleasure.

Other Factors That May Influence Outcomes

It is important to include in a follow-up study of learning disabled children all descriptive characteristics, familial background and educational history of the subjects that may have a bearing on the outcomes of interest in order to ensure that the data will yield as comprehensive a picture as possible. Three

factors known to have an impact on the educational, occupational, and affective outcomes are IQ, father's occupation (indicative of family socioeconomic status) and number of grades repeated during schooling.

Intelligence (IQ)

While learning disability is no longer defined using a formula that takes the child's IQ into consideration, assignment to special learning disabled resource settings is based on an IQ within the normal range in at least one of either verbal or nonverbal abilities. In determining causes leading to academic failure, Cunningham & Barkley (1978) list low intelligence as the first predisposing factor. It is a generally accepted fact that educational outcomes are brighter for children with higher mental capacity. Studies reviewed dealing with both short term and long term effects of remediation included only subjects whose IQ scores were average or higher as measured by standardized tests such as the WISC-R.

Socioeconomic Status (SES)

It has been well established in the literature relevant to social and motivational influences, that children's school performance levels are raised or lowered according to the SES-biased educational expectations and occupational aspirations held for them by their parents. Wigfield & Asher (1984) state that research has clearly

demonstrated that children from lower SES homes perform less well in reading than children from middle class homes with the difference increasing over age (Coleman et al., 1966; Jencks, 1972; St. John, 1970). This influence is so pervasive that for first-grade pupils, teachers believe that student social class is the most important factor for predicting school success or failure (Goodwin & Sanders, 1969). Since the father's job is an indicator of the family's SES status, this information must necessarily be taken into account in compiling follow-up data.

Grade Repetition

With respect to specific schooling practices, the impact of non-promotion is open to question. Silvernail (1981) has reported that some recent studies indicate no adverse effects and apparently some positive effects on self-concept. Other research has failed to substantiate the assumption that grade repetition has educational value. Jackson (1975) after reviewing 44 research studies on non-promotion and 54 discussion papers, concluded that "there is no reliable body of evidence to indicate that grade retention is more beneficial than grade promotion for students with serious academic or adjustment problems" (p. 627). Malicky & Beebe (1982) suggest that unless substantial special help is provided for repeaters, recycling them through a program that was inappropriate for their needs may be more detrimental than helpful to

their progress. It appears that grade repeating may be contributing to the handicapping effects of reading disability noted in the Preston & Yarington (1967) study. Chiefly, grade repetition slackens educational pace, thereby limiting academic aspiration and ultimate achievement and narrowing vocational possibilities. In any event grade repetition information must necessarily be included in the compilation of follow-up data.

CHAPTER III

METHODOLOGY

The researcher's intention was to obtain a comprehensive picture of the specific long-term effects of individualized remediation on the adult functioning of learning disabled children. This chapter provides a description of the procedures involved in the follow-up survey conducted in order to obtain the information needed to support the hypotheses. Included are the hypotheses, a description of the sample, the survey design, the data collection procedures and a description of the data analysis procedures. Twenty variables were used to assess the academic, occupational and social/psychological outcomes that were selected for study. These measurements are detailed and the basic model, used to present these variables in blocks in order to facilitate analysis, is described.

Hypotheses

School Outcome Hypotheses

1. The proportion of students in group 2 repeating grades will be lower than will the proportion in group 1.
2. The proportion of students in group 2 graduating from high school will be greater than will the proportion of students in group 1.

3. The students in group 2 will have higher aggregate composite high school leaving marks than will the students in group 1.
4. Proportionately fewer students in group 2 will have left school before completing Grade 11 than will have students in group 1.
5. Proportionately more students in group 2 will have obtained higher education/job training than will have students in group 1.

Career Outcome Hypotheses

6. Students in group 2 will have been successful in obtaining higher status job placements as measured by the Blishen Occupational Scale than will have students in group 1.
7. Subjects in group 2 will have a higher probability of being students than will subjects in group 1.
8. Group 2 students, since they are still in school, will have a higher probability of being unemployed than will students in group 1.
9. Students in group 2 will have a proportionately higher rate of employment than will students in group 1.

Social/Psychological Outcome Hypotheses

10. Proportionately more students in group 2 will have overcome their childhood shyness than will have students in group 1.
11. Proportionately more students in group 2 will have overcome their childhood frustration than will have students in group 1.
12. Proportionately more students in group 2 will have achieved independence in coping with their problems than will have students in group 1.
13. Students in group 2 will be participating in a greater number of social activities within their community than will students in group 1.
14. Students in group 2 will be reading more both for information and pleasure than will students in group 1.

The Sample

The subjects of the longitudinal study were 36 students formerly seen at the Diagnostic and Remedial Unit. The study took the form of a follow-up survey which was intended to make a comparative evaluation of the educational progress, occupational status and emotional and social adjustment of two groups of young adults who were diagnosed by Unit personnel as learning disabled during their elementary school years. The degree of disability varied among individuals, but all referrals

from both school and parental sources were made because of underachievement in regular school programming which was considered to be attributable to reading problems.

The first group consisted of 15 subjects who were seen for academic assessment only. They were diagnosed prior to 1973, at a time when remediation services were not provided by the Unit. The same battery of standardized tests was administered to all students irrespective of initial presenting problems. A typical written report for this group is included as Appendix 1. All of these students were diagnosed as needing remedial instruction in reading, but received no special one-to-one remediation in the clinic. There was some consultative contact with referring school personnel shortly after the assessments were done. Suggestions for remediation were made, but no other follow-up information was available and the students were presumed to have participated only in those reading activities which their teachers normally provided in the regular classroom.

The second group consisted of 21 subjects seen for academic assessment by experienced diagnosticians or remedial instructors on the D and R Unit staff. They were diagnosed as needing individualized remedial help in reading. Assessment procedures for this group followed the basic procedure detailed in the Diagnostic Procedure section. The diagnosis differed from that of group 1 in that selection of both standardized and informal test

instruments varied according to the presenting problems of the individual children. A typical written assessment report indicating specific tests utilized is included as Appendix 2. A lag of at least a year behind expected grade level had to be demonstrated in the diagnostic findings in order for a child to be considered for individualized remediation. Two or three year lags were frequently observed, and it was not uncommon to find children who were, in essence, nonreaders.

As a supplement to their regular school program, the students in this group received an individualized, clinical remediation program. All programs were designed to provide the support structure and the skill development necessary for successful achievement in academic work, and the consequent improvement in self-concept. The programs generally included: instruction in the basic skills required for reading, spelling, and writing; consultation with school personnel to explain the nature of presenting problems and to make suggestions for classroom management; and advice to parents on coping strategies and family activities to give the child a sense of well being in the home environment. The sessions at the Unit continued until such time as it was estimated that the children could cope adequately with their school program without undue regression. In some cases, however, complications such as poor attendance, lack of transportation, and

school leaving forced termination of sessions before sufficient progress had been made.

Although the researcher was studying only a sample, the interest was really to learn about the general population from which the sample was drawn. It was therefore important that the sample be as representative as possible of the general population of learning disabled persons. It was the intention to conform to the recommendations of authorities such as Borg & Gall (1983) who suggest that in order to attain the objectives of planned research the general rule is to use the largest sample possible. In correlational research it is generally desirable to have a minimum of 30 cases. In a causal-comparative study such as this, a minimum of 15 cases should be included in each group being compared. Initially, it seemed that it would be an easy matter to obtain the required number of cases since there were known to be over 2000 referrals to the Diagnostic and Remedial Unit. These files had been collected since the clinic first opened in 1971 as a Learning Centre. The files of the students seen for academic assessment only, prior to the establishment of the remedial component of the Unit, had been stored separately, thus facilitating selection of subjects for a comparative evaluation of the two groups. The Learning Centre files numbering 350, covering the period from 1971 to 1973, formed the data pool for group 1, the nonremediation group. According to the present D

and R Unit numbering system, an additional 2885 referrals had been made up to the time of follow-up in 1987. These files were arranged alphabetically and filed according to classification as current and noncurrent. The noncurrent files, numbering approximately 2340, included those students who had been seen for remediation as well as those seen for diagnosis only after the formation of the Unit. These noncurrent files of the children who had received remediation formed the data pool for group 2, the remediation group.

It was important to select as follow-up subjects only those children whose problem was primarily a learning disability rather than a learning problem brought about by other factors. For this reason an exhaustive screening of those past files was conducted in order to generate names of potential cases for follow-up. Eliminated from the pool were those students whose learning problems were related primarily to visual, hearing or motor handicaps. Also excluded were students whose problems were attributable to mental retardation, emotional disturbance or environmental disadvantage.

In order to control confounding variable factors as much as possible, the subjects selected satisfied the following predetermined criteria:

1. They were all boys, since the Unit files contained many more records of problematic boy readers than girl readers.

2. All had an IQ score of at least 90 on either the Performance Subscale of a WISC Full-Scale, the Peabody Picture Vocabulary Test, or on the Raven's Standard Progressive Matrices.

3. All had hearing within the normal range.

4. All had vision within the normal range.

5. All had demonstrated a lag of at least one year behind their school grade in reading level at the time of initial diagnosis. This reading performance was measured by standardized and/or informal testing (Durrell Analysis of Reading Difficulty, Peabody Individual Achievement Test, or the Silvaroli Reading Inventory).

In addition to these criteria, time restrictions further limited the number of subjects that could be considered for selection. Since the subjects' school cumulative records were a main source of information for data collection, the researcher had to personally visit the school of each participating subject in order to examine these records. For this reason only subjects referred from schools operated by the Avalon Consolidated and the Roman Catholic School Boards in St. John's, and the Avalon North Integrated School Board were included in the survey.

Survey Design

The researcher's plan was to make a comparative evaluation between the subjects in group 1 who received no clinical remediation and those in group 2 who did receive weekly individualized remediation at the D and R Unit. In order to obtain the necessary information, the researcher designed a written parental questionnaire for each group. These questionnaires constituted the main instrument for the collection of data. They were designed to yield information that would provide detailed histories of past and present functioning of the subjects selected. Questions were asked pertaining to age and grade at beginning of remediation, grades repeated, last grade completed at school leaving, whether or not the students graduated, post secondary education, occupation, emotional and social adjustment and present reading habits. This information was added to what was already available in Unit files regarding the reason for referral, presenting problems, severity of disability and treatment history. The group 2 questionnaire included an additional section in which parents were asked to comment on the remedial assistance offered to their children at the clinic. A copy of the questionnaire for group 1 has been included as Appendix 3, and a copy of the questionnaire for group 2 has been included as Appendix 4.

For all of the subjects in both groups, additional information on their educational histories was obtained

from past school cumulative records. The students' permission as well as authorization from the school boards involved were obtained in order to permit the writer to examine the cumulative record files. Information taken from the cumulative records included the level of education received at school leaving, the marks received in each grade, and the comments made by the various class teachers as the children progressed through the grades. A special tabulation form was designed by the researcher to contain all school information on one sheet so that all grade results from kindergarten to school leaving could be readily accessed. For students in group 2, the grades during the remediation period were highlighted for the purpose of observing if exam marks improved during the remediation period, and the duration of improvement, if any. Information gleaned from all three sources, the clinic files, the parental questionnaires, and the school cumulative records was combined. It was then possible to note the establishment of parent/child interaction in the home, and teacher/child interaction in the classroom. Changes and developmental trends in these areas were noted as well as the varying viewpoints of parents and teachers regarding their perceptions of the children's learning problems.

The data were studied, categorized in tabular form, and linked to the three major areas of consideration stated in the purpose of the study: academic attainment,

occupational status, and emotional and social adjustment. The categorized findings were then analyzed statistically to see whether the information gained could be interpreted as evidence to support the fourteen hypotheses. It was intended that if the majority of these hypotheses were born out by the findings, the positive results could be considered attributable in some measure to the individualized remedial instruction received in the clinic.

Data Collection

Using the screening procedure described, a list of 107 names was generated. From these it was initially intended to collect data on two groups of 30 students. In group 2 where the intervening time between diagnosis and follow-up was somewhat less than for group 1, and individualized remediation provided, it was anticipated that there would be some degree of appreciation for this free service and that they would be more likely to return the questionnaires. Therefore, 47 letters of request were sent out in the hope of getting 30 replies. It was anticipated that there might be some difficulty in obtaining the data on group 1 because of the longer period of time since the diagnosis and the fact that parents were not given a written report of the diagnostic findings. It was believed that since no remediation was

received, the parents of this group would feel under no obligation to respond to the letter requesting their co-operation to complete and return the parental questionnaire. To allow for this, 60 letters were sent in the hope of getting 30 replies.

When returns failed to come in after a two week interval, a second letter was sent to all 107 parents but with little avail. Next phone calls were made. This turned out to be a very lengthy and arduous task. Despite the fact that the purpose of the study had been clearly described in the letter of request, most of the parents wanted a full explanation of why the study was being conducted, how the information would be used, and why it was being done after such a long time had elapsed since the period of diagnosis and remediation. Overall, however, most of the parents were reasonably cooperative on the phone, and all but four agreed to forward the questionnaires. This, though, was not done.

Eventually, second phone calls had to be made requesting permission to come personally to collect the replies. Only two parents agreed to this, one from each group. One of these required three visits to secure the form but the visit for the second questionnaire was futile because the student didn't want the researcher prying into his personal affairs and refused to sign the permission form. All the other parents promised to mail in the surveys directly. Finally, after four solicitations, 23

replies were received in group 2 and 16 in group 1, a total of 39.

When these were checked it was found that two subjects in group 2 and one in group 1 did not meet the criteria and had to be eliminated from the study. The final count resulted in 21 in group 2 (45% return) and 15 in group 1 (25% return), an overall return of 34%. This was a very disappointing return and had an inhibiting effect on the design model. Those parents who did return the questionnaires gave thoughtful, painstaking responses to the various questions. Group 1 parents, though dealing with older memories of their children's developmental stages, appeared as reliable in their responses as those in group 2. These factors partially compensated for the poor response in terms of number of questionnaires received.

The poor return was a major limitation of the study. Borg and Gall (1983) suggest that when more than 20 percent fail to respond, it may be the case that the nonresponding group represents a biased sampling; that is, the people who did not respond to the questionnaire are in some measurable way different from those who did respond. A common sampling bias is that persons having positive outcomes are more likely to respond than those having negative outcomes, and that people fail to return questionnaires in which deficiencies would be revealed. If indeed, such a sampling bias was present in this study,

the findings might well be spurious. The question that could be posed is "Would the results have been changed if all the subjects had returned the questionnaire?".

In order to find an answer to this question, the researcher attempted to gain some insight into the nature of the nonresponding group. Since less than 10 percent responded to the initial letter of request it appeared that the nonrespondents' attitudes represented the predominant view point of the sample. By analyzing comments made by the nonrespondents during the telephone conversations to secure their response, it was possible to make some pertinent observations.

Many of the parents seemed troubled because it was being suggested that their children had learning problems even though they were often the ones who had initially referred their children to the Unit and had brought them in for the remedial sessions. Those whose children had done well and were no longer experiencing the adverse affects of their disability were anxious about responding. They seemed to fear that by admitting the problem had ever existed they might somehow jeopardize their children's present favorable standing. Of all the nonrespondents contacted only four were adamant in their refusal to participate. In these instances, one parent wanted to know how she could be expected to remember about one child's problems after all these years, when she had seven children all of whom had learning problems. Another

parent, himself an educator, stated that he and his wife were outraged that it would be suggested that their son had a childhood reading problem, even though they had referred him and the mother had brought him in for several months of remediation. An affluent mother explained that she couldn't be bothered filling in the survey form as it would be a waste of her valuable time. One father complained that the remedial sessions were of no help to his son so he was not going to respond. Upon questioning it turned out that the boy had been able to successfully complete high school and find a job, but traces of his childhood disability had remained.

No obvious differences were noted in terms of the educational background or socioeconomic status of the respondents and nonrespondents. The nonresponding parents who returned the questionnaires after considerable prompting answered the questions in the same manner as the responding group. The initial respondents appeared to be an unbiased sample of those to whom the questionnaires were mailed. The group 2 respondents represented those who were most appreciative of the assistance received from the Unit. In summary, the findings suggested that the results may have been much the same even if all the parents had returned the questionnaires.

The process of obtaining the school data went much more smoothly than the collection of data from the parents' questionnaires. The three school boards involved

provided written letters of permission to enter the schools under their respective jurisdictions. In turn, the principals and staffs of all 15 schools visited were cooperative and helpful. Upon request, the researcher was given the cumulative record files and provided with a quiet place in which to examine them. There was considerable variation in the amount of information recorded from school to school, and in a few instances it was necessary to contact elementary schools because some students' files had not accompanied them to high school. Not a single record was missing even though in some cases 17 years had elapsed since the students had been seen for diagnosis at the Unit. Depending on the amount of information in the files, anywhere from half an hour up to two hours of time was spent on each of the 39 files examined.

Analytic Procedures

Variable Description

The data were prepared in a machine readable form. Following this a statistical analysis was conducted. Twenty variables were used in the analysis. They are described as follows.

Treatment Group (GROUP). The first of the variables referred to the allocation of the 36 cases in the total student sample into 2 groups. Group 1, coded 1, consisted

of 15 students who were seen at the Diagnostic and Remedial Unit for diagnostic assessment only during the period from 1971 - 1973. This group is referred to throughout as the non-remediation group because they did not receive clinical remediation at the Diagnostic and Remedial Unit. Group 2, coded 2 consisted of 21 students or 58 percent of the total who received both diagnosis and remediation at the Diagnostic and Remedial Unit during the period 1973 - 1981. This information was obtained from the Unit files.

Length of Treatment (TREAT). This variable referred specifically to the number of hour-long individualized remedial reading sessions received by students in both groups at the Diagnostic and Remedial Unit. Information was obtained for this variable by examining the subjects' Unit files. As attendance was kept by the instructors and sessions totalled at the time they were terminated, it was possible to obtain exact figures for this variable.

Cognitive Ability (IQ). This mnemonic referred to IQ scores as measured by the WISC-R, Peabody Picture Vocabulary Test, or Raven's Standard Progressive Matrices. Each of these has a mean of 100 and a standard deviation of 15. All subjects in group 1 received WISC testing by the diagnostic team at the Unit whereas some scores for group 2 came from testing performed by school personnel which was made available to the Unit at the time of

referral. Information was obtained from the clinic files for this variable.

Father's Occupational Status (FOCC). The father's job placement was coded as measured by the Blishen Occupational Scale (Powers, 1982, pp. 43-54). See Appendix 5 for a copy of this scale. The information on the father's job was obtained from the student files at the Unit. It was one of the questions asked in the referral form that is completed by the parents at the time of the initial meeting for diagnostic assessment of the child. There were two instances where this information was withheld by parents.

Number of Grades Repeated (REPEAT). The number of grades repeated by the subjects in both groups during their years of schooling was referred to here. A repeat means spending a second year in the same school grade repeating the same curricula instead of being promoted to the next grade. This reflects school policy throughout the province of having students repeat a grade irrespective of mental ability or presenting problems as a means of helping those who do not meet the requirements of examinations set to determine readiness for the next grade. This information was obtained from the parental questionnaire and was also tabulated during the examination of the subjects' school cumulative records. Figures on this variable are stable because the metric is common.

High School Graduation or Not (GRAD). This variable denoted whether the subjects in both groups successfully completed the last grade of high school available at the time of schooling. Grade 11 was the highest grade possible for group 1 and 11 or 12 for group 2, since Grade 12 was introduced into the province in 1983. This variable could not be applied to the five students still in high school who had not had the opportunity to graduate. This information was tabulated from the subjects' school cumulative records, and coded based on 1 representing not graduated and 2 representing high school graduation.

Composite High School Leaving Mark (MARK). The average mark obtained over all subjects taken during the last term of graduating or school leaving year was indicated by this variable. Five subjects in group 2 who were still students in high school had to be excluded from this measurement. An average mark can only serve as an estimate of a subject's ability to satisfy the requirements for successful completion of a school grade where a mark of 50 is considered a pass. This information was obtained from the subjects' school cumulative records. In each case the average mark obtained was coded. Since the marks involved were received on different examinations and evaluated by different markers using different criteria, this variable is not a very stable or accurate measurement.

Last Grade Successfully Completed (GRADE). The last grade successfully completed by students in the full sample at the time of school leaving was denoted by this mnemonic. The variable GRADE could not be applied to the five subjects in group 2 who were still in high school. Information came from both the parent survey and school cumulative records. It was coded such that 1 = grade 9 or less, 2 = grade 10, 3 = grade 11, 4 = grade 12.

Higher Education or Not (HRED). The variable description "higher education" referred to any job training beyond high school including trade school, university, or technical college, that was received by subjects except the five in group 2 who were still completing high school. The variable was coded such that 2 = higher education and 1 = no higher education. This information was obtained from the parental questionnaire in response to the following question (see Appendix 3 or 4). Further education/job training; University _____ _____ Trade School _____ Other _____. Comment on training received; _____ _____.

Occupational Status (OCCUP). This variable referred to the job status of the subjects in both groups who found employment on leaving high school. It was measured by the Blishen Occupational Scale and coded accordingly. Those subjects still in high school and others in post secondary settings were treated as students so that only 23 of the

36 subjects were considered under this variable. The information was obtained from the parental questionnaire in response to the question: Present occupation: _____ _____ (see Appendix 3 or 4).

Student Or Not (EMPLOY1). Whether the subjects were students or not was indicated by this variable. Twenty-seven of the subjects were not students at either a high school or post secondary level. Four of the subjects were post secondary students and five were high school students. Information was obtained from the parental questionnaire (see Appendix 3 or 4). This variable was coded by assigning the number 0 to all subjects who were students, and the number 1 to all other subjects who were not students.

Unemployed Or Not (EMPLOY2). This variable referred to how many of the subjects were unemployed. The five subjects in group 2 still in high school could not be dealt with under this variable, so that only 31 cases were considered. Of these, 27 were employed. The four remaining subjects were unemployed. For coding purposes, the four unemployed subjects were assigned the number 0, while all other subjects were assigned the number 1.

Employed Or Not (EMPLOY3). This variable denoted the number of subjects who were employed at the time the survey was conducted. Leaving out the five still in high school, 31 cases were considered. The 23 out of 31 subjects who were employed were assigned the number 1 for

coding purposes. All other subjects were coded 0. The information coded for all the EMPLOY variables was obtained from the parental questionnaire in response to the same group of questions as for the HRED and OCCUP variables (see Appendix 3 or 4).

Shy-Change (SHY1). This variable was an indicator of whether or not the subjects overcame childhood shyness. Information for this variable was obtained from the parental questionnaire (see Appendix 3 or 4). A checklist of social, personal, and behavior difficulties sometimes related to learning disabilities was presented and the parents were asked to check those which they thought described their sons as young children. They were then requested to explain what effects, if any, the children's problems had on their lives and the families' while they were growing up. Finally they were asked to describe any changes their children showed both in personality and in ability to cope with their problems as they grew toward maturity. The comments made by teachers in the school cumulative records in this regard were also considered. This was a dichotomous variable where 1 was coded as representing no change in shyness and 2 representing a change in state from shyness to no longer being shy.

Frustration-Change (FRUST1). This was a dichotomous variable where 1 was coded to represent no change in frustration and 2 represented a change in state from

frustrated to no longer frustrated. Information was obtained from the same source as for the SHY1 variable.

Independence-Change (INDEP1). Whether subjects who had displayed immaturity were able to achieve independence or not was denoted by this variable, and the information was again obtained from the same source as for the SHY1 and FRUST1 variables. This variable was also dichotomous with 1 coded to represent no change and 2 coded to represent a change from childhood dependence toward adult independence.

Number of Social Activities (ACTIVE). The number of social activities in which the subjects participated was denoted by this variable. This information was obtained from the parental questionnaire in response to the request: List the social and recreational activities in which your son takes part (this will include sports, youth groups, church groups, service clubs or others you might know) (see Appendix 3 or 4). This information was not obtained for 2 of the 36 cases so that only 34 cases were considered. This variable was coded with a range of 1 = no activities to 4 = more than 4 activities.

Reading for Information (READI). An estimation of the amount of required reading for information purposes done by subjects in both groups was indicated by this variable. The information was obtained from the parental questionnaire in response to the request: Circle the item that best describes your son's present reading habits:

Reads for information: Very often, often, fairly often, seldom, never (see Appendix 3 or 4). The coding for this variable was based on having 1 = never, 2 = seldom, 3 = fairly often, 4 = often and 5 = very often. This information was not obtained for one subject so that 35 cases were considered.

Reading for Pleasure (READP). This variable referred to the amount of reading engaged in by subjects in both groups as a pleasurable leisure activity. This information was obtained from the parent questionnaire in response to the request: Circle the item that best describes your son's present reading habits: Reads for pleasure: Very often, often, fairly often, seldom, never. For coding purposes labels ranged from 1 = never to 5 = very often. Information was missing for 2 subjects so that 34 cases were considered.

Reading Composite (RDG). This variable referred to a reading composite arrived at by adding two reading variables, READI, representing reading for information, and READP, reading for pleasure. This variable was coded using values from 2 to 10 to represent the range of reading from never to very often in both categories.

It should be noted that variables HRED, EMPLOY1, EMPLOY2, EMPLOY3, SHY1, FRUST1 and INDEP1 are dummy variables. Dummy variables are useful in analysis of data when the independent variables are categorical. A dummy variable has been defined by Kerlinger and Pedhazur (1973)

as "A vector in which members of a given category are assigned an arbitrary number, while all other subjects not belonging to the given category are assigned another arbitrary number" (p. 105). The simplest method of creating dummy variables is to assign 1's to subjects of a group one wishes to identify and 2's to all other subjects (or alternatively, 0's and 1's). This is basically a coding system. Subsequent investigators may choose to use a multi-point scale in preference to a dichotomous means of measuring the variables shyness, frustration, and independence in order to better estimate the magnitude of the personality changes made.

Presenting the Variables in Blocks

To facilitate analysis a basic model was used to present the variables in four blocks as follows.

Block 1: Background Variables

GROUP, TREAT, IQ, FOCC, REPEAT

Block 2: School Outcomes

GRAD, MARK, GRADE, HRED

Block 3: Career Outcomes

OCCUP, EMPLOY1, EMPLOY2, EMPLOY3

Block 4: Social/Psychological Outcomes

SHY1, FRUST1, INDEP1, ACTIVE, READI, READP, RDG

The intention of the researcher was to examine the relationship between the five background variables and the

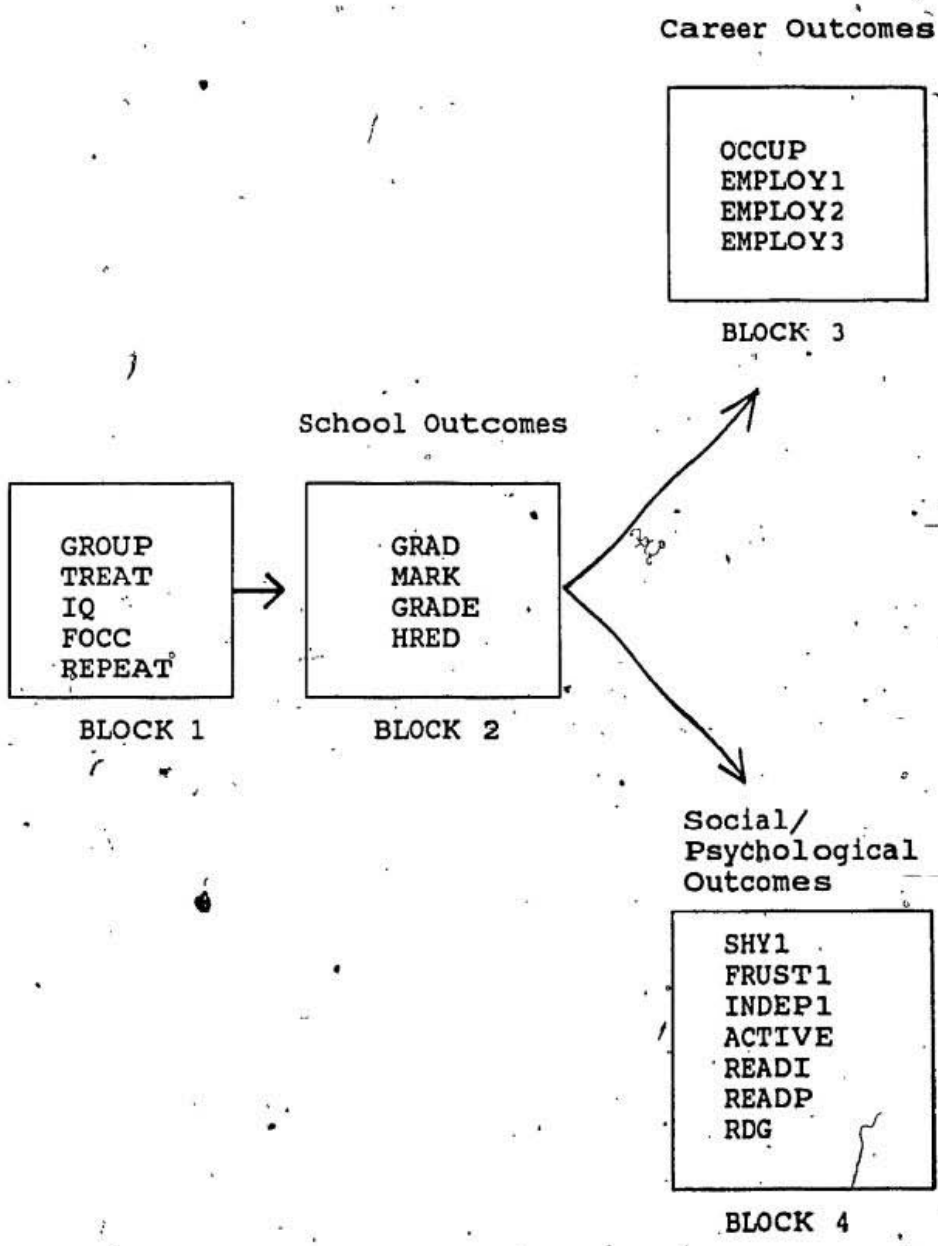

Figure 1. Conceptual Model of the Causal Relations between Variables.

intervening school related variables. The intervening variables, in turn, related to the career outcome variables and the social/psychological outcome variables. This model is depicted in Figure 1. The variables used were intended to provide a series of measurements on which to base a comparison between the two groups of reading disabled students in terms of school outcomes, career outcomes and social/psychological outcomes. By arranging the variables in the four blocks with GROUP being an independent variable, the researcher hoped to be able to demonstrate significant positive differences in these outcomes for the subjects in group 2 who received the individualized remediation treatment in the clinical setting of the Diagnostic and Remedial Unit.

Stages in the Analysis of the Data

To achieve the stated purpose, the analysis of the data was conducted in separate stages. Stage one involved an analysis of the whole sample of 36 subjects in order to obtain descriptive statistical information on all 20 variables. It included means, standard deviations, kurtosis, skewness and the minimum and maximum ranges for each variable. In stage two, a comparison was made between the means and standard deviations for the total sample, for group 1, the non-remediation group, and for group 2, the remediation group. Stage 3 involved a one-way analysis of variance for the total sample with GROUP

as the independent variable. In stage four a correlation between the variables for the total sample was conducted with the significance between the correlations measured at the .05 level. When it became evident that the researcher's hypotheses were not being supported using GROUP as the independent variable, it was decided that it might be more accurate to use TREAT, the length of treatment, as the independent variable since in the data collection process it was revealed that both groups had received some remediation services from home and school sources. It was decided to conduct a separate exploratory analysis on the group 2 data using TREAT as the independent variable to show more accurately the impact of the clinical individualized remediation. Stage five, then, dealt with an examination of correlations and t-values for relationships between TREAT (length of treatment) and a range of variables for group 2 including school outcomes, career outcomes and social/psychological outcomes. In stage six a correlation matrix was drawn up to examine the relationship between the variables in the remediation model at the .10 level of significance. Finally in stage seven a simple regression analysis was conducted to verify that the findings of stages five and six could be upheld and were not spurious.

CHAPTER IV

FINDINGS OF THE STUDY

The purpose of this chapter is to present the findings of the study as they relate to the 14 hypotheses. The hypotheses concern the relationships between individualized remediation treatments and the long-term educational, occupational, social and psychological outcomes of the learning disabled students. Since the results of a statistical analysis often act as a catalyst for additional or extended analyses, the results of additional findings on incremental modeling will also be examined.

Data Analysis of Full Sample

In accordance with the basic model used, the descriptive statistics for the 20 variables are presented in Table 1. The findings of the statistical analysis will be presented under four headings.

1. The important information gleaned from the background variables will be presented.
2. The relationship between the blocks of background variables and school outcomes will be discussed.
3. The relationship between the background variables and career outcomes will be presented.

TABLE 1

Descriptive Statistics for the 20 Variables

	Variable Mnemonic	Description of Variable	Mean	STD Dev.	Kurtosis	Skewness	Minimum	Maximum	No. of Cases	
X1	GROUP	Treatment Group	1.58	.50	-1.989	- .353	1.00	2.00	36	
X2	TREAT	Length of Treatment	24.03	27.06	- .535	.858	.00	86.00	36	
X3	IQ	Cognitive Ability	101.81	9.00	- .174	.764	91.00	123.00	36	Block 1
X4	FOCC	Father's Occupational Status	44.27	14.84	- .567	.647	24.97	74.22	34	
X5	REPEAT	Number of Grades Repeated	1.11	.82	- .082	.444	.00	3.00	36	
X6	GRAD	HiSchool Grad or Not	1.68	.48	-1.462	- .798	1.00	2.00	31	
X7	MARK	Composite HiSchool Leaving Mark	56.33	8.67	.029	- .390	35.00	71.00	30	
X8	GRADE	Last Grade Successfully Completed	2.90	.98	- .294	- .709	1.00	4.00	31	Block 2
X9	HIED	Higher Education or Not	1.74	.45	- .697	-1.163	1.00	2.00	31	
X10	OCCUP	Occupational Status	39.24	10.20	.201	.719	25.90	65.10	23	
X11	EMPLOY1	Student or Not	.13	.34	3.649	2.327	.00	1.00	31	
X12	EMPLOY2	Unemployed or Not	.13	.34	3.648	2.327	.00	1.00	31	Block 3
X13	EMPLOY3	Employed or Not	.74	.45	- .697	-1.163	.00	1.00	31	
X14	SHY1	Shy Change	1.33	.48	-1.544	.738	1.00	2.00	36	
X15	FRUST1	Frustration Change	1.50	.51	-2.121	.000	1.00	2.00	36	
X16	INDEP1	Independence Change	1.50	.51	-2.121	.000	1.00	2.00	36	
X17	ACTIVE	No. of Social Activities	2.38	.95	- .634	.469	1.00	4.00	34	Block 4
X18	READI	Reading for Information	3.26	.95	.070	.099	1.00	5.00	35	
X19	READP	Reading for Pleasure	2.68	1.30	- .854	.384	1.00	5.00	34	
X20	RDG	Reading Composite	5.94	1.79	.076	.362	3.00	10.00	34	

4. The relationship between the background variables and the psychological outcomes involving self-concept changes will be discussed. These relationships along with the relationships between background variables and reading social activities will be referred to as the social-psychological outcomes.

The information gleaned from the background or source variables indicated that there were 36 clients of the Diagnostic and Remedial Unit in the total sample. They were divided into two groups. Group 1 (n = 15), the non-remediation group, received diagnosis only at the Unit, while group 2 (n = 21), the remediation group, received varying amounts of treatment in the form of individualized remedial sessions at the Unit. Although the mean was 24, the amounts ranged from 0 sessions received by all subjects in group 1 up to a maximum of 86 sessions received by a student in group 2. The cognitive ability levels of all subjects fell into the normal range (91-123) with a mean of 101.81. As none were retarded, it is expected that they would respond positively to remedial treatment and as a consequence would, in time, be able to cope with their reading problems. The mean Blishen scale job ranking of 44 for fathers of all subjects in both groups with a range from 24.97 to 74.22 was interpreted to mean that a broad range of socioeconomic status was represented. One may conclude, therefore, that there is

no discernible bias as to who gets accepted in this regard. Most tended to come from middle class, middle income families, with smaller numbers from more affluent and less affluent families. Approximately one-third of them had to repeat at least one grade in order to complete high school for reasons attributable to their reading problems.

With regard to the school outcomes, it turned out that the majority of the students graduated from high school with either Grade 11 or 12, with an average school leaving mark of 56 in final examinations. The majority (74 percent) went on to some higher form of education or job training.

In respect to career outcomes, it appeared that the reading disabled students overall, obtained employment in job placements slightly lower on the Blishen Scale than their fathers. However, most were successful in obtaining employment or were still pursuing educational goals to better their occupational chances.

The statistics on the social-psychological outcomes indicated that between 65 and 75 percent of the subjects overcame their early childhood shyness, frustration and over dependence. Eighty-three percent of the subjects were participating in social activities mainly involving sports and recreation with the majority of these clustered in the 1 - 2 activity bracket. Only 5 of the 34 cases considered were not taking part in any activity. More

than half the subjects were reading both for information and pleasure at least fairly often. Only one subject never read at all, while six others would never choose reading as a pleasurable leisure activity.

Comparison Between Groups

Based on the data collected from the parent survey and the examination of school cumulative records of the respondents, a comparison was made between the means and standard deviations of the two groups (see Table 2). After examining the differences between the means of the two groups it became evident that the study did not produce the results hoped for (see ANOVA results, Table 3). In fact, even a cursory examination of the comparative means in Table 2 reveals that it was not possible to support any of the 14 hypotheses related to school, career and social/psychological outcomes. The null hypotheses had to be accepted in all instances. There was a weak relationship between placement in group 2 and the OCCUP variable, the occupational status of the subjects as measured by the Blishen Scale, but this was not significant at .05 level. These findings for the 14 hypotheses are discussed next.

TABLE 2

Descriptive Statistics for Variables in the Total Sample, Group 1 and Group 2

			Total Sample			Group 1			Group 2		
	Variable Mnemonic	Description of Variable	$\bar{X}$	SD	No. Cases	$\bar{X}$	SD	No. Cases	$\bar{X}$	SD	No. Cases
X1	GROUP	Treatment Group	1.58	.50	36		NA			NA	
X2	TREAT	Length of Treatment	24.03	27.06	36	.0	.0	15	41.2	23.2	21
X3	IQ	Cognitive Ability	101.81	9.00	36	104.5	10.0	15	99.9	8.0	21
X4	FOCC	Father's Occupational Status	44.29	14:84	34	47.9	14.4	13	42.1	15.0	21
X5	REPEAT	Number of Grades Repeated	1.11	.82	36	1.0	.7	15	1.2	.9	21
X6	GRAD	HiSchool Grad or Not	1.68	.48	31	1.7	.5	15	1.7	.5	16
X7	MARK	Composite HiSchool Leaving Mark	56.33	8.47	30	56.8	8.4	14	55.9	9.1	16
X8	GRADE	Last Grade Successfully Completed	2.90	.98	31	2.9	.9	15	2.9	1.1	16
X9	HRED	Higher Education or Not	1.74	.45	31	1.7	.5	15	1.8	.4	16
X10	OCCUP	Occupational Status	39.24	10.20	23	37.8	6.9	11	40.6	12.7	12
X11	EMPLOY1	Student or Not	.13	.34	31	.2	.4	15	.1	.3	16
X12	EMPLOY2	Unemployed or Not	.13	.34	31	.1	.3	15	.2	.4	16
X13	EMPLOY3	Employed or Not	.74	.45	31	.7	.5	15	.8	.4	16
X14	SHY1	Shy Change	1.33	.48	36	1.3	.5	15	1.4	.5	21
X15	FRUST1	Frustration Change	1.50	.51	36	1.5	.5	15	1.5	.5	21
X16	INDEP1	Independence Change	1.50	.51	36	1.5	.5	15	1.5	.5	21
X17	ACTIVE	Number of Social Activities	2.38	.95	34	2.2	.7	13	2.5	1.1	21
X18	READI	Reading for Information	3.26	.95	35	3.2	1.0	14	3.3	1.0	21
X19	READP	Reading for Pleasure	2.68	1.30	34	2.9	1.5	13	2.5	1.2	21
X20	RDG	Reading Composite	5.94	1.79	34	6.2	2.1	13	5.8	1.6	21

TABLE 3

One-Way ANOVAS for the Total Sample

Table 3.1

Criterion = REPEAT, No. grades repeated

Group	Sum of Squares	df	Mean Square	F-ratio	Sig. Level
Between Groups	.3175	1	.3175	.4645	.5002
Within Groups	23.2381	34	.6835		

Table 3.2

Criterion = CRAD, HiSchool graduate or Not

Group	Sum of Squares	df	Mean Square	F-ratio	Sig. Level
Between Groups	.0034	1	.0034	.0144	.9053
Within Groups	6.7708	29	.2335		

Table 3.3

Criterion = MARK, Composite HiSchool Leaving Mark

Group	Sum of Squares	df	Mean Square	F-ratio	Sig. Level
Between Groups	5.3720	1	5.3720	.0691	.7945
Within Groups	2175.2946	28	77.6891		

Table 3.4

Criterion - GRADE, Last grade successfully completed

Group	Sum of Squares	df	Mean Square	F-ratio	Sig. Level
Between Groups	.0388	1	.0388	.0393	.8443
Within Groups	28.6708	29	.9886		

(TABLE 3 CONTINUED)

Table 3.5

Criterion = HRED, Higher Education or Not

Group	Sum of Squares	df	Mean Square	F-ratio	Sig. Level
Between Groups	.0022	1	.0022	.0105	.9190
Within Groups	5.9333	29	.2046		

Table 3.6

Criterion = OCCUP, Occupational Status

Group	Sum of Squares	df	Mean Square	F-ratio	Sig. Level
Between Groups	43.2206	1	43.2206	.4046	.5316
Within Groups	2243.5276	21	106.8346		

Table 3.7

Criterion = EMPLOY1, Student or Not

Group	Sum of Squares	df	Mean Square	F-ratio	Sig. Level
Between Groups	.1464	1	.1464	1.2718	.2687
Within Groups	3.3375	29	.1151		

Table 3.8

Criterion = EMPLOY2, Unemployed or Not

Group	Sum of Squares	df	Mean Square	F-ratio	Sig. Level
Between Groups	.1130	1	.1130	.9725	.3322
Within Groups	3.3708	29	.1162		

Table 3.9

Criterion = EMPLOY3, Employed or Not

Group	Sum of Squares	df	Mean Square	F-ratio	Sig. Level
Between Groups	.0022	1	.0022	.0105	.9190
Within Groups	5.9333	29	.2046		

(TABLE 3 CONTINUED)

Table 3.10

Criterion = SHY1, Shy Change

Group	Sum of Squares	df	Mean Square	F-ratio	Sig. Level
Between Groups	.1143	1	.1143	.4928	.4875
Within Groups	7.8857	34	.2319		

Table 3.11

Criterion - FRUST1, Frustration Change

Group	Sum of Squares	df	Mean Square	F-ratio	Sig. Level
Between Groups	.0286	1	.0286	.1083	.7441
Within Groups	8.9714	34	.2639		

Table 3.12

Criterion = INDEP1, Independence Change

Group	Sum of Squares	df	Mean Square	F-ratio	Sig. Level
Between Groups	.0286	1	.0286	.1083	.7441
Within Groups	8.9714	34	.2639		

Table 3.13

Criterion = ACTIVE, Number of Social Activities

Group	Sum of Squares	df	Mean Square	F-ratio	Sig. Level
Between Groups	.4836	1	.4836	.5238	.4745
Within Groups	29.5458	32	.9233		

Table 3.14

Criterion = RDG, Reading Composite

Group	Sum of Squares	df	Mean Square	F-ratio	Sig. Level
Between Groups	.9520	1	.9520	.2903	.5938
	104.9304	32	3.2791		

Findings Related to School Outcome Hypotheses

Hypothesis 1. The proportion of subjects in group 2 repeating grades will be lower than the proportion in group 1.

There was little difference in the number of grades repeated by the two groups as indicated by the mean of 1.0 for group 1 and 1.2 for group 2 on the variable REPEAT (see Table 2). The hypothesis was rejected since the difference between the means, as indicated in Table 3.1, was not significant.

Hypothesis 2. The proportion of students in group 2 graduating from high school will be greater than the proportion in group 1.

As can be seen from Table 2, the means for the two groups on the variable GRAD were the same, 1.7 in both instances. Because the coding of the variable was 1 = not graduated, 2 = high school graduate, a mean score of 1.7 should be interpreted to mean that 70 percent of the subjects in each group graduated from high school. Obviously, then, the two groups were the same in this regard as is demonstrated by the non-significant finding in Table 3.2.

Hypothesis 3. Students in group 2 will have higher composite high school leaving marks than the students in group 1.

Being in group 2 did not produce a long-term effect on marks at the time of finishing school. As shown in Table 2 the mean of 56.8 for group 1 was slightly higher than the mean of 55.9 for group 2. Table 3.3 indicates that on the variable MARK there was no significant difference between the two groups.

Hypothesis 4. Proportionately fewer students in group 2 will have left school before completing grade 11 than students in group 1.

The variable GRADE in Table 2 has a mean of 2.9 for both groups. A score of 1 indicates that the student completed grade 9 or less while a score of 2 indicates completion of grade 10. Completing grade 11 was scored as 3 and finishing grade 12 was assigned a 4. The mean of 2.9 for each group, then, should be interpreted as the typical student in each group having completed grade 11. As is evident and as shown in Table 3.4, there was no significant difference between groups.

Hypothesis 5. Proportionately more students in group 2 obtained higher education/job training than students in group 1.

The mean of 1.8 for group 2 and 1.7 for group 1, as shown in Table 2, for the HRED variable indicates there

was little difference in the amount of higher education received. This is verified by a non-significant finding in Table 3.5. Since a score of 1 meant no higher education had been done and a score of 2 meant that some post secondary education had been completed, a mean of 1.8 and 1.7 indicates that 80 percent and 70 percent of the students in group 2 and group 1 respectively had taken some form of educational training past high school.

Findings Related to Career Outcome Hypotheses

Hypothesis 6. Students in group 2 will have been successful in obtaining higher status job placements as measured by the Blishen Occupational Scale than students in group 1.

The mean of 40.6 for students in group 2 and of 37.8 for students in group 1 on the OCCUP variable (Table 2) indicates that there was some difference in occupational level but the difference was not significant (Table 3.6). A mean of 40.6 for group 2 means that a typical student from this group would have a job such as a foreman or supervisor in a processing plant, while a student from group 1 would typically have a job as a mechanic or repairman (not electrical).

Hypothesis 7. Subjects in group 2 will have a higher probability of still being students after completing high school than subjects in group 1.

A mean of .1 for group 2 and a mean of .2 for group 1 (Table 2) on the EMPLOY1 variable indicates that 10 percent of group 2 and 20 percent of group 1 were still students and, therefore, could not be employed. The difference in the means for the groups was not significant as shown in Table 3.7.

Hypothesis 8. Group 2 subjects, since they are still in school will have a higher probability of being unemployed than subjects in group 1.

The EMPLOY2 variable in Table 2 refers to whether subjects were unemployed or not. A mean of .2 for group 2 indicates that 20 percent of the group were unemployed while a mean of .1 for group 1 indicates an unemployment rate of 10 percent for the group. Table 3.8 shows no significant difference between the unemployment rate of the two groups.

Hypothesis 9. Subjects in group 2 will have a proportionately higher rate of employment than subjects in group 1.

The mean in Table 2 for group 2 on the EMPLOY3 variable was .8 and for group 1 was .7. Eighty percent of group 2 subjects and 70 percent of group 1 subjects were,

therefore, employed. Although there was a 10 percent difference for the two groups, the difference was not statistically significant as shown in Table 3.9.

Findings Related to Social/Psychological Outcome Hypotheses

Hypothesis 10. Proportionately more subjects in group 2 will have overcome their childhood shyness than subjects in group 1.

The mean for the SHY1 variable (overcoming childhood shyness) in Table 2 was 1.4 for group 2 and 1.3 for group 1. A score of 1 was allocated to subjects who (a) were never considered to be shy and, hence, did not change, and (b) who were shy as children and continued to be shy as adults. A score of 2 was given to subjects who did change from being shy as children to not being shy as adults. A mean of 1.4 for group 2, then, indicates that 40 percent of the subjects in the group overcame childhood shyness while 30 percent in group 1 overcame their shyness. Despite the 10 percent difference, Table 3.10 shows that it is not significant.

Hypothesis 11. Proportionately more subjects in group 2 will have overcome their childhood frustration than subjects in group 1.

Table 2 shows that, on the FRUST1 variable, the mean for both groups was 1.5. A score of 1 was given to (a) subjects who were never frustrated because of learning

problems and, hence, did not change their degree of frustration and (b) subjects who were frustrated and continued to be frustrated by the problem. A score of 2 was given to subjects who were frustrated as children by learning problems but had been successful in overcoming this frustration by adulthood. A mean of 1.5, then, indicates that half of the subjects in each group were able to overcome their childhood frustration with learning to read. When the means for both groups are identical, there is obviously no significant difference in the groups. This is verified by Table 3.11.

Hypothesis 12. Proportionately more subjects in group 2 will have achieved independence in coping with their problems than subjects in group 1.

As with the frustration variable, the mean in Table 2 for the INDEP1 variable was 1.5 for both groups. A score of 1 was given to (a) subjects who were always independent in coping with their problems and, hence, did not change, and (b) subjects who depended on others to help them cope with their problems and continued to be this way as adults. A score of 2 was given to subjects who had been dependent as children but had become independent in handling their own problems as adults. A mean of 1.5 indicates that half of the subjects in each group were able to assume independence as adults. The means are,

logically, not significantly different and this is verified in Table 3.12.

Hypothesis 13. Subjects in group 2 will be participating in a greater number of social activities within their community than subjects in group 1.

A mean of 2.5 for group 2 and of 2.2 for group 1 on the ACTIVE variable in Table 2 indicates that subjects in each group, on average, take part in 2 - 3 social activities within their community on a regular basis. The slight difference between the means for the two groups was not significant as shown in Table 3.13.

Hypothesis 14. Subjects in group 2 will be reading more both for information and pleasure than subjects in group 1.

Table 2 shows a mean of 5.8 for group 2 and 6.2 for group 1 on the RDG variable. The RDG variable was a composite of the reading for information variable (READI) and the reading for pleasure variable (READP). On each of these single variables the scoring was as follows: 1 = never read; 2 = seldom read; 3 = read fairly often; 4 = read often and 5 = read very often. When the scores of the variables were added together to form the composite, a subject would obtain scores on the RDG variable as 2, 4, 6, 8 or 10. A mean of 5.8 for group 2 and 6.2 for group 1 indicates that, on average, subjects read fairly often.

Table 3.14 shows that, despite a slight difference in the means in favor of group 1, the difference was not significant.

In conclusion it seems that receiving remediation in a clinical setting had no significant effect on any of the school, career or social/psychological outcomes considered in the study. The patterns of school achievement and career success were approximately the same for both groups. Similarly, there were no noteworthy differences in the social/psychological outcomes for the two groups.

Correlation Findings: Total Sample

It will be noted that the previous findings in Tables 2 and 3 were supported by the correlation matrix findings of Table 4. Placement in the remediation group, under the variable mnemonic GROUP did not have a significant relationship with any of the outcome variables. There were however, a series of other interesting relationships that did emerge, and while they were not part of the researcher's original design for this study, they provided information of relevance to the whole area of the provision of remedial services to the reading disabled; hence they are discussed here.

It is noteworthy that while GROUP had no significant effect on any outcome, there was a significant negative relationship between GROUP and IQ. The implication here

TABLE 4

Correlation Matrix of Variables in the Total Sample[ab]

	Variable	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20
X1	GROUP	1.000	.000	.068	.139	.250	.453	.397	.422	.460	.266	.134	.166	.460	.244	.372	.372	.237	.416	.195	.297
X2	TREAT	.761	1.000	.290	.132	.256	.412	.272	.278	.399	.020	.094	.082	.477	.463	.259	.488	.485	.151	.330	.198
X3	IQ	-.253	-.095	1.000	.018	.001	.001	.003	.097	.229	.052	.014	.453	.039	.136	.186	.435	.195	.189	.255	.165
X4	FOCC	-.192	-.197	.363	1.000	.099	.001	.001	.012	.064	.147	.003	.276	.005	.251	.276	.044	.097	.316	.237	.386
X5	REPEAT	.116	.113	-.512	-.226	1.000	.002	.012	.106	.175	.062	.272	.272	.175	.097	.212	.212	.301	.198	.062	.258
X6	GRAD	.022	.042	.536	.563	-.496	1.000	.000	.000	.312	.107	.074	.375	.088	.001	.360	.051	.404	.450	.440	.424
X7	MARK	-.050	-.115	.482	.558	-.409	.575	1.000	.002	.469	.299	.092	.127	.027	.129	.145	.269	.151	.174	.393	.248
X8	GRADE	.037	.110	.240	.417	-.231	.719	.504	1.000	.233	.212	.098	.031	.006	.025	.169	.099	.246	.360	.364	.328
X9	HEED	.019	.068	.138	.290	.174	-.092	.015	-.136	1.000	.120	.110	.110	.028	.362	.134	.185	.093	.325	.305	.275
X10	OCCUP	.137	.429	.348	.240	-.329	.269	.119	.175	.256	1.000	.000	.000	.000	.204	.296	.192	.493	.093	.283	.138
X11	EMPLOY1	-.205	-.243	.396	.495	-.113	.266	.249	.239	.227	b	1.000	.213	.000	.216	.421	.166	.117	.084	.192	.087
X12	EMPLOY2	.180	.257	.022	.115	-.113	.060	.215	.339	.227	b	-.148	1.000	.000	.074	.027	.166	.387	.003	.443	.101
X13	EMPLOY3	.019	-.011	-.121	.471	.174	-.249	-.357	-.442	-.348	b	-.653	-.653	1.000	.312	.098	.066	.273	.133	.232	.476
X14	SHY1	.120	-.016	.188	.119	-.243	.476	.213	.356	-.066	.181	.146	-.266	.092	1.000	.500	.247	.279	.072	.130	.477
X15	FRUST1	.056	.111	-.153	-.106	.137	-.067	-.200	.178	-.205	.118	.037	-.349	.239	.000	1.000	.023	.107	.001	.416	.041
X16	INDEP1	.056	-.005	-.028	-.296	.137	-.298	-.117	-.238	-.167	.191	-.180	-.180	.276	.118	.333	1.000	.188	.203	.416	.283
X17	ACTIVE	.127	-.007	.152	.236	.093	-.047	-.202	-.133	.253	-.004	.228	-.056	-.117	-.104	.219	.156	1.000	.386	.049	.093
X18	READI	.037	.180	.154	-.087	.148	.024	-.181	.068	-.086	.286	.258	-.489	.210	.252	.511	.145	.051	1.000	.085	.000
X19	READP	-.152	.078	.117	.131	-.269	.029	-.054	.068	-.099	.129	.168	-.028	-.142	-.198	.038	.038	.293	.241	1.000	.000
X20	RDG	-.095	.150	.172	.053	-.115	.037	-.134	.086	-.116	.243	.259	-.244	.012	-.010	.302	.102	.236	.712	.853	1.000

The key to the mnemonics is as follows: GROUP = Treatment Group; TREAT = Length of Treatment; IQ = Cognitive Ability; FOCC = Fathers' Occupation Status; REPEAT = Number of Grades Repeated; GRAD = HiSchool Graduation or Not; MARK = Composite HiSchool Leaving Mark; GRADE = Last Grade Successfully Completed; HEED = Higher Education or Not; OCCUP = Occupational Status; EMPLOY1 = Student or Not; EMPLOY2 = Unemployed or Not; EMPLOY3 = Employed or Not; SHY1 = Shy Change; FRUST1 = Frustration Change; INDEP1 = Independence Change; ACTIVE = Number of Social Activities; READI = Reading for Information; READP = Reading for Pleasure; RDG = Reading.

a. Correlation coefficients below the diagonal; significance level above the diagonal.
b. Inadequate case base. Correlation could not be computed.

is that those who received the remedial treatments had the lowest IQs; that is, those most in need of remediation received it.

Correlations Between Background and Schooling Variables

Table 4 indicates that in terms of the source (or exogenous) variables both IQ and FOCC had important relationships with the intervening variables, the school outcomes. Thus, two reasons students with reading problems received good marks in school or completed 12 grades of schooling, irrespective of whether they received remediation instruction in reading, were because they had high cognitive ability and came from homes with the resource base necessary to promote and sustain these achievements. These are relationships that should not be disregarded. IQ influenced to some extent, whether a respondent graduated or not, and also the number of grades repeated; namely, (i) the higher the IQ the greater the probability of graduation; and (ii) the higher the IQ the fewer the number of grades repeated. The significant positive correlations between FOCC and the intervening variables GRAD, MARK and GRADE indicated that those students coming from higher socioeconomic backgrounds were more likely to receive high marks, attain high grades and remain in school until graduation.

The REPEAT variable had significant negative relationships with the intervening variables, GRAD, MARK,

and GRADE. In other words the more grades repeated the less likely students were to graduate; the less likely they were to receive high marks, and the less likely they were to complete the higher grades (grades 11 and 12).

Correlations Between Background/Schooling Variables and Career/Social-Psychological Variables

Whether a student was employed or gainfully occupied following the termination of schooling proved to be related to two factors: (i) father's occupation and (ii) last grade completed. In this regard the negative sign on the correlation coefficient meant that those who completed the fewest grades and those who came from the lowest status homes were those most likely to be employed. This relationship tended to reflect the parent comments on the questionnaire and was interpreted to mean that parents of lower socioeconomic status generally held lower educational aspirations for their children. They appeared to be well satisfied if their children stayed in school until they were old enough to leave and find a job. Subjects who had found jobs and were self supporting were considered by their parents to be independent. It is also noteworthy that those who were successful in gaining employment after leaving school were the most likely to lose their frustration.

Change in shyness, from shy to less shy, was related to GRAD and GRADE. In other words, students who graduated from high school and those who completed the highest

grades were the ones most likely to overcome the shyness problem. Only GRAD was related to change in independence, INDEP1, and this relationship was negative. One might interpret this to mean that the earlier the student left school the sooner he became independent.

Inhibiting Factors Leading to Rejection of Hypotheses

While the relationships emerging from the correlation findings were interesting and informative, they failed to provide any support for the hypotheses that were intended to demonstrate that placement in group 2, the remediation group, would have a significant bearing on the school, career, and social/psychological outcomes over the long-term. Since this was the thesis of the study, having all of the hypotheses with GROUP as the independent variable rejected was unexpected. This would have been a startling conclusive finding had not evidence accumulated as the data collection progressed that made this outcome less surprising. This evidence is presented below in the sequence that it became apparent to the researcher.

Stage 1. Originally it was believed that the Diagnostic and Remedial Unit files would provide an excellent source of information for a study such as this, but it turned out that they had some serious limitations. Whereas the diagnostic component was established as a research project, the remedial component was not. The present Diagnostic and Remedial Unit operates as a

clinical service to school boards and the general community so that its data base is not primarily research-oriented. There were some problems associated with this. Some of the measurements were not as reliable as had been anticipated for the group 2 students. Group 1 students had all received an identical battery of tests and these were reported with the preciseness necessary for the compilation of statistical data. Group 2 data tended to be based more on informal observations of the subjects' handling of the reading process. Various tests were used in order to make practical recommendations for remediation rather than for compiling standardized data for research purposes. This tended to apply to IQ scores as well as to the diagnostic testing of reading abilities.

Stage 2. With the low return of questionnaires, three disparities between the two groups became noticeable because of the limited size of the sample. First, the IQ scores of group 1 tended to be somewhat higher so that these children might have been expected to cope more effectively with their reading problems. Second, the group 1 subjects also tended to be seen for assessment by Unit staff at an earlier age, so that corrective measures may have been instituted earlier with increased chance for success. Group 1 median age when seen was 9.2 years, with a range from (6.4 - 14.7) while group 2 subjects' median age was 11 years, with the range from 6 to 14 years. The median grade level when seen for group 1 was Grade 3 with

a range from 1 through 6, while for group 2, it was Grade 4 with a range from 1 through 8. Third, children less severely disabled tended to have been seen during the period from which group 1 subjects were drawn. By contrast the remedial unit tends to accept the most serious cases for clinical remediation. This may have affected some outcomes.

Stage 3. By far the most significant limitation was the fact that no follow up information was available in the Unit files. It was only when the researcher began searching through the school cumulative records and noting the findings of the parent questionnaires that it became apparent that a significant number of schools had initiated remediation programs of their own before children were tested at the Unit. Other schools had responded to the recommendations of the Unit diagnoses and conducted varying programs of remediation with the subjects in group 1 after the assessment. In addition, a considerable amount of parentally supported tutoring was provided. It was no longer a study of remediation versus no remediation but rather a comparison between two groups only one of which received varying amounts of individualized clinical remediation at the D and R Unit.

Given these facts the findings were not altogether surprising. There was nevertheless, considerable doubt that the findings represented the true state of these outcomes as they would apply to a true remediation versus

nonremediation situation. It was believed that in this instance, given the information provided in the data, that it might not be whether the subjects in group 2 received remediation, but how much individualized remediation they received in the clinical setting that might make a difference.

Additional Analyses for Group 2

It was decided that perhaps the length of treatment might make a difference in the findings. To test this hypothesis group 2 subjects were examined separately using TREAT as the independent variable. Because there were only 21 cases, group 2 was a very small sample to analyze, so the findings necessarily had to be interpreted cautiously. Since this was not the original intention of the study, this part of the analysis was exploratory. The researcher, therefore, felt justified in changing the significance (or alpha) level from the conventional level of $\alpha = 0.05$ to $\alpha = 0.10$. This was to minimize the error of accepting a null hypothesis when it may have been false. It was felt that under the circumstances described, this new alpha level was both legitimate and acceptable.

Correlations Between Length of Treatment and Outcome Variables

This additional analysis is presented using a table of correlations and t-values for relationships between length of treatment and a range of outcomes for group 2 subjects. The results are presented in Table 5. As before, they were examined in the same three clusters of variables, school outcomes, career outcomes and social-psychological outcomes.

School outcomes.

Length of treatment did not appear to have any significant effect on the 16 of the 21 cases considered under this block of variables. Only 16 subjects could be used in the analysis because 5 were still in school. The null hypothesis was accepted for the varying lengths of individualized treatment in the clinical setting. In other words, the length of treatment did not improve the long-term outcomes of the subjects in terms of whether or not they graduated from high school, the level of marks they received at school leaving, grade level they attained or amount of higher education they received after school leaving.

Career outcomes.

The length of treatment did not appear to be significant as to whether the 16 subjects out of the 21 considered under this block of variables were still students, employed or unemployed. There was, however, an outstanding finding in that a significant relationship

TABLE 5

Correlations and T-values for Relationships between Length of Treatment and a Range of Outcomes for Group 2 Subjects[1]

Variables	Pearson Correlation	T-value	Sig. Level	No. of Cases	Decision i.e. whether to accept null hypothesis	
TREAT/GRAD	.054	.204	.841	16	Yes	
TREAT/MARK	.161	-.609	.553	16	Yes	SCHOOL OUTCOMES
TREAT/GRADE	.168	.639	.533	16	Yes	
TREAT/HRED	.118	.446	.663	16	Yes	
TREAT/OCCUP	.568	2.182	.054	12	No	
TREAT/EMPLOY1	.256	-.989	.340	16	Yes	
TREAT/EMPLOY2	.222	.853	.408	16	Yes	CAREER OUTCOMES
TREAT/EMPLOY3	.057	-.215	.833	16	Yes	
TREAT/SHY1	.210	-.937	.361	21	Yes	
TREAT/FRUST1	.139	.610	.549	21	Yes	
TREAT/INDEP1	.097	-.426	.675	21	Yes	
TREAT/ACTIVE	.174	-.769	.451	21	Yes	
TREAT/READI	.299	1.367	.188	21	Yes	SOCIAL/ PSYCHOLOGICAL OUTCOMES
TREAT/READP	.411	1.968	.064	21	No	
TREAT/RDG	.479	2.377	.028	21	No	

[1]For a Key to the mnemonics see Table 1.

emerged between TREAT and OCCUP. Although 9 subjects who were still students at either high school or university level could not be included, the null hypothesis was rejected for the 12 cases out of the 21 who were considered. The length of treatment in the clinical setting appeared to have a long-term effect on the career outcome of these subjects, in that they obtained higher job placement as measured by the Blishen Occupational Scale. This was a very positive finding, one that is congruent with the researcher's experience. The longer the subjects received individualized remediation to overcome childhood reading difficulties, the higher the job status they attained as adults.

Social-Psychological outcomes.

None of the null hypotheses relating to the self-concept variables SHY1, FRUST1, INDEP1, and ACTIVE could be rejected. It could not be demonstrated that length of treatment had any direct bearing on long-term outcomes in these areas. It was not possible to reject the null hypothesis for the READI variable. However, the null hypothesis for the READP variable, could be rejected. The length of treatment was positively related to the amount of reading for pleasure done by group 2 respondents. This finding may be interpreted as follows: that as a direct consequence of having received varying amounts of individualized clinical remediation to overcome their reading disabilities, the subjects in group 2 showed an

improved attitude toward reading in that they would voluntarily choose reading as a pleasurable leisure activity. The null hypothesis was also rejected for the RDG (reading composite) variable. This meant that the length of remediation treatment had an overall positive influence on the amount of reading that group 2 students did both for information and pleasure. This outcome would be considered one of the most desirable from the point of view of those engaged in remediation instruction.

Additional Correlation Findings

Other relationships not identified in Table 5 were noted and are discussed here with the understanding that they are ex-post-facto or after the fact; hence, serendipitous (Table 6). Although some of the interpretations may be somewhat speculative, the relationships themselves are significant and worthy of consideration. There is some justification for believing that they may not be spurious findings. It appeared that both IQ and FOCC had a significant bearing on the school outcomes. Students with higher IQs who came from homes with higher socioeconomic backgrounds were more likely to graduate from high school with higher marks and obtain more post-secondary education than other reading disabled students. These two variables also appeared to be predictors of higher status job placements. Perhaps because of high parental expectations these students

TABLE 6

Correlation Matrix of Variables in the Remediation Model, Group 2[abc]

Variable		X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20
X2	TREAT	1.000	.163	.329	.424	.421	.276	.267	.331	.027	.170	.204	.416	.180	.275	.338	.226	.094	.032	.014
X3	IQ	.225	1.000	.334	.077	.066	.089	.115	.042	.137	.154	.109	.042	.278	.417	.130	.202	.437	.228	.327
X4	FOCC	-.103	.099	1.000	.287	.031	.018	.006	.176	.147	.227	.043	.022	.292	.072	.068	.226	.039	.491	.148
X5	REPEAT	.045	-.122	-.130	1.000	.075	.066	.288	.314	.263	.471	.280	.314	.237	.089	.032	.252	.072	.414	.244
X6	GRAD	.054	.393	.476	-.377	1.000	.002	.000	.387	.164	.260	.111	.068	.019	.206	.060	.240	.197	.238	.148
X7	MARK	-.161	.355	.529	-.394	.666	1.000	.005	.399	.338	.292	.082	.056	.108	.046	.048	.057	.040	.105	.021
X8	GRADE	.168	.319	.615	-.152	.876	.618	1.000	.449	.139	.159	.098	.038	.051	.239	.126	.228	.352	.326	.287
X9	HRED	.118	.446	.249	.131	-.078	-.069	-.035	1.000	.127	.291	.149	.104	.291	.083	.139	.154	.302	.459	.409
X10	OCCUP	.568	.344	.331	-.203	.309	.135	.341	.358	1.000	.000	.000	.000	.211	.497	.440	.309	.064	.419	.288
X11	EMPLOY1	-.256	.272	.201	.020	.174	.148	.267	.149	c	1.000	.324	.041	.104	.198	.167	.327	.409	.137	.172
X12	EMPLOY2	.222	.325	.441	-.157	.324	.366	.340	.277	c	-.124	1.000	.000	.078	.051	.030	.391	.009	.443	.075
X13	EMPLOY3	-.057	-.446	.510	.131	-.389	-.412	-.456	-.333	c	-.447	-.832	1.000	.291	.022	.010	.308	.012	.231	.029
X14	SHY1	-.210	.136	.126	-.165	.522	.327	.423	.149	.256	.333	-.372	.149	1.000	.436	.246	.232	.217	.021	.171
X15	FRUST1	.139	-.049	-.331	.306	-.221	-.435	-.191	-.364	.003	-.228	-.424	.509	-.037	1.000	.027	.245	.011	.466	.085
X16	INDEP1	-.097	-.257	-.337	.411	-.405	-.431	-.304	-.289	-.049	-.258	-.480	.577	.159	.427	1.000	.245	.039	.157	.387
X17	ACTIVE	-.174	.192	.174	.155	-.191	-.410	-.200	.272	-.160	-.122	-.075	.136	-.169	.160	.160	1.000	.349	.159	.313
X18	READ1	.299	.037	-.394	.330	-.229	-.451	-.103	.140	.466	-.063	-.583	.560	.180	.494	.394	-.090	1.000	.290	.000
X19	READP	.411	-.172	-.005	-.051	-.192	-.331	-.122	-.028	-.066	-.292	-.039	.198	-.447	.020	-.231	.229	.128	1.000	.000
X20	RDG	.479	-.104	-.239	.160	-.279	-.514	-.152	.063	.180	-.253	-.378	.482	-.218	.311	.067	.113	.691	.806	1.000

[a]For a Key to the mnemonics see Table 1.
[b]Correlation Coefficients below the diagonal; Significance level above the diagonal.
[c]Inadequate case base. Correlation could not be computed.

remained in school longer in order to complete their education even though the academic situation was frustrating for them due to the persistence of reading problems. Since overcoming frustration appeared to be strongly related to obtaining employment and since it was positively correlated with reading for information one could conclude that students who left school early and obtained jobs seemed to overcome their childhood frustration. There were also significant positive relationships between IQ and grade level, and IQ and occupational status. The students who remained in school longer were necessarily dependent upon their parents for a longer period than their less bright peers who quit school early and took up lower status jobs. Even though they were staying in school these students were perceived by their parents to be immature and lacking in responsibility because they did not read often enough for study purposes. The findings, notwithstanding these problems, indicated that the eventual outcome for these students was better in terms of job placement.

Selected Regression Analyses

On the basis of the correlations for relationships between length of treatment and OCCUP and between length of treatment and the two reading variables, READP, reading for pleasure and RDG, reading composite, it was possible to reject the null hypotheses and predict that there was a

significant relationship with length of treatment making a difference in the level of job placement attained by group 2 students as measured by the Blishen Occupational Scale, and the amount of reading both for information and pleasure done by these students. It appeared that the greater the number of remedial sessions received, the more effective the outcome was over the long-term for both these important areas. Even though this evidence appeared quite clear, it was possible that the extent to which length of treatment accounted for the job status and reading improvement might be questioned. For instance, it might be suggested that perhaps it was not the treatment that made the difference; it could have been a proxy for socioeconomic status. It might also be suggested that the remediation was given to those who responded most successfully because of their high ability so that treatment may have been a proxy for IQ. To demonstrate that these were not the case and to test the authenticity of these findings, it was decided to do a regression analysis looking at the regression of OCCUP and READP and RDG on background factors controlling for FOCC representing socio-economic factors, and IQ representing intelligence. These findings are shown in Table 7 and indicated that TREAT emerged as a predictor even when controlling for FOCC and IQ. The beta coefficients for the impact of TREAT on OCCUP and RDG controlling for FOCC and IQ were .566 and .507 respectively. Both were

TABLE 7

Betas, Standard Errors, T-values and Significance Levels for the Regression of OCCUP and RDG on the Background Variables

	Dependent Variables									
	OCCUP					RDG				
Independent Variables	B	SE(B)	Beta	T-val	Sig.T	B	SE(B)	Beta	T-val	Sig.T
FOCC	.313	.212	.3711	.472	.179	-.018	.022	-.167	-.815	.426
IQ	.286	.410	.180	.698	.505	-.040	.042	-.201	-.960	.350
TREAT	.309	.140	.566	2.198	.059	.035	.014	.5072	.420	.027
Mult. R	.711					.551				
R-Square	.506					.304				
Constant	-13.894					9.162				

significant at the alpha less than .06 level. Table 7 findings are depicted diagrammatically in Figure 2.

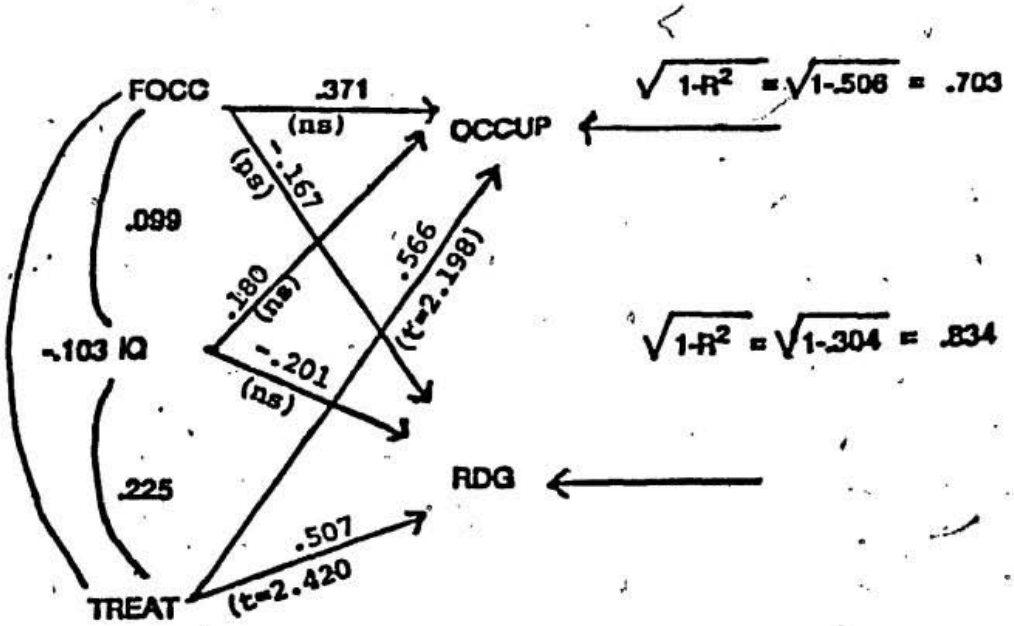

Figure 2. Path Model of the Relationships in the Remedial Treatment Model of Job Status at Career Entry and Amount of Reading following High School Graduation

CHAPTER V

SUMMARY, INTERPRETATIONS AND IMPLICATIONS

Summary and Interpretations

As a remedial reading instructor, the researcher has observed the short term benefits of individualized remediation and wondered whether long-term benefits also accrue to enhance the growth of learning disabled young readers into adulthood. Realizing that reading disability is persistent and unlikely to disappear with time unless some intervention is undertaken, it was anticipated that the longer the remediation was provided the greater the "down stream", long-term benefits would be. This longitudinal research project was designed to see if the long-term effectiveness of remediation could be demonstrated.

The study was carried out in the Diagnostic and Remedial Unit Clinic at Memorial University, St. John's, Newfoundland. It involved two groups of students seen at the clinic, one for diagnosis only and the other for diagnosis and reading remediation. The total sample was comprised of 36 subjects, 15 in group 1, the nonremediation group, and 21 in group 2 the remediation group. The study took the form of a long term follow-up survey designed to make a comparative evaluation of the two groups in terms of schooling, occupational, and

social/psychological outcomes. The data was collected using a parent questionnaire as the main instrument, supported by information gathered from an inspection of school cumulative records as well as from Unit files. All subjects in the sample were classified as children whose major problem was a learning disability in the area of reading.

The data collected on the subjects from the three sources were tabulated and organized for statistical analysis. Twenty variables were coded for the study and to facilitate analysis a basic model was used to present the variables in blocks. The four blocks included background or source variables, intervening school outcome variables, career outcome variables and social/psychological outcome variables. By examining relationships between the blocks of variables with GROUP (placement in group 1 or group 2) being the independent variable, the researcher was attempting to see if there were any significant differences in the outcomes for the subjects in group 2, the remediation group. It was believed that if the majority of the 14 hypotheses were supported by the findings, the positive results could be interpreted to mean that the remedial instruction received in the Unit was related not only to temporary improvement, but to benefits that held up over the long term for group 2 subjects.

The major findings as measured by statistical procedures discussed earlier in this study are summarized in categories. Findings on the full sample are highlighted first followed by a comparison of the findings between group 1 and group 2. Finally, an exploratory analysis on group 2 is presented because some interesting relationships that were not part of the researcher's original design emerged in the correlational analysis. Some informal observations based on analysis of the comments made by parents and school personnel are also included.

Findings on Full Sample

The background variables indicated that all subjects were within the normal range of intelligence and came from a broad spectrum of socio/economic backgrounds. Approximately one third had to repeat at least one grade in order to complete high school. Reasons for grade repetition were attributed to their reading problems.

The schooling outcome variables indicated that the majority graduated from high school (about two thirds) with only 8 subjects (or 22 percent) dropping out. The mean grade attained was grade 11. Most subjects obtained some form of higher education or job training after leaving school.

In terms of career outcomes, most subjects (87 percent) were successful in obtaining employment or were

still pursuing educational goals. Their job placements were slightly lower on the Blishen Occupational Scale than their fathers' (with a mean of 39.24 compared to 44.00). Instead of being fairly evenly distributed, 80 percent of the jobs were in the lower middle-class range.

The social/psychological outcome variables indicated that between 65 and 75 percent of the subjects had overcome childhood shyness, frustration and over dependence. In terms of social adjustment, 83 percent of the subjects were participating in at least one or two social activities mainly involving sports and recreation. With regard to reading habits, more than 50 percent of the subjects were reading both for information and pleasure at least fairly often. Only one never read at all while six others never read for pleasure.

These findings are consistent with those studies reported in the review of literature (Balow & Blomquist, 1965; Bruck, 1985; Preston & Yarington, 1967; Robinson & Smith, 1962) which indicate that the prognosis for the educational, occupational and social/psychological functioning of children with reading disabilities is optimistic. Although they may require more time than nondisabled peers, they do complete high school and are not at particular risk for dropping out before graduation. Many successfully continue into higher academic education and most obtain some additional training for employment.

Most of the subjects in this study were successful in obtaining jobs which were satisfying to them, thus permitting them to overcome the frustrations experienced during schooling. There was nothing to indicate that a learning disability as such is a precursor of unemployment. Many of the problems associated with shyness, frustration and immaturity noted in childhood had disappeared with age. More than half the subjects with childhood problems were considered to be well adjusted at follow-up. Some still experienced mild problems with social adjustment but very few were reported to be socially isolated. There were several instances of poor psychological adjustment recorded, which had not required professional assistance, that were similar to findings reported by Balow & Blomquist (1965), Bruck (1985), and Spreen (1982). It appeared to be uncertain whether these instances of poor social functioning and maladjustment were attributable to pervasive long-term effects of childhood learning disabilities as suggested by Mauser (1974), or to other varying circumstances in the lives of the individuals concerned. For example, in three observed cases, the subjects involved were adopted children. Quite likely their problems were related to some combination of factors, learning disability being one of them. These findings appear to tie in with the results of follow-up and retrospective studies of other clinic or normal populations reviewed by Robins (1979).

Comparison Between Group 1 and Group 2

In relation to the three blocks of outcome variables, the ANOVA results for the 14 proposed hypotheses related to adult educational, occupational and social/psychological functioning supported the null hypothesis in every case. It was concluded on the basis of these results that placement in the remediation group, group 2, under the variable mnemonic GROUP had no bearing on any of the outcomes. It was felt by the researcher that these negative results reflected the limiting features of the study that were noted during the data collection process.

These limitations involved some unreliable measurements in the case of some of the variables because of weak instrumentation and lack of a common metric. Unanticipated disparities between the two groups became noticeable because of the smallness of the sample. On the whole, group 1 tended to have somewhat higher IQs, earlier diagnosis and to have a less severe disability than group 2 subjects. Most important was the fact that school cumulative records indicated that all except five, group 1 subjects had received some form of special help other than clinical remediation. The study, then, was no longer a study of remediation versus no remediation. As a consequence, the results could hardly be expected to support the hypotheses.

Correlation Findings: Total Sample

In addition to supporting the null hypotheses, the correlation matrix findings revealed a series of relationships relevant to the provision of remedial services. These are listed below.

1. There was a significant negative relationship between GROUP and IQ which implied that those having the lowest IQs were the ones who received remediation; thus those most in need of remediation received it.

2. IQ had important influences on school outcomes in that those subjects with higher IQ scores were more likely to graduate and repeat fewer grades during school.

3. FOCC was positively related to the variables GRAD, MARK and GRADE implying that subjects coming from higher socio-economic backgrounds were likely to receive higher marks, attain higher grades and remain in school until graduation.

4. The REPEAT variable had significant negative relationships with GRAD, MARK and GRADE, indicating that the higher the number of grades repeated the lower the likelihood of receiving high marks, attaining higher grades and graduating from high school.

5. Background variable FOCC and intervening school variables GRAD and GRADE influenced the career outcome variable EMPLOY3 in that subjects coming from lower status homes who had completed the fewest grades and left school without graduating were most likely to be employed in

lower middle-class occupations as measured by the Blishen Occupational Scales.

6. Those subjects who found employment were most likely to have overcome their childhood frustration associated with reading problems.

Group 2 Analyses

Much of the belief in the effectiveness of remedial reading programs is a matter of faith (Balow, 1965). Even though both ANOVA results and correlational findings failed to provide support for the 14 hypotheses with GROUP as the independent variable, it was decided to conduct separate analyses on group 2 subjects using TREAT, length of treatment, as the independent variable. To remove doubts about accepting the null hypotheses when they may have been false, it was decided that exploratory analyses using TREAT might show more accurately the benefits of the clinical individualized remediation.

The findings indicated that a significant relationship emerged between TREAT and OCCUP. The length of treatment in the clinical setting appeared to have a long term effect on the career outcome of group 2 subjects, in that they obtained higher job placement as measured by the Blishen Occupational Scale. The null hypotheses were also rejected for the READP and RDG variables, thus indicating that the clinical individualized remediation had fostered an improved

attitude toward reading and more effective use of the skill for information purposes. These findings provided support for provision of remediation services. When one considers that the mean TREAT, length of treatment, for the clinical group was 41 hours, this in reality represents only 1 2/3 days in an individual's life. Given this fact and the study limitations, it is encouraging to note that even such a limited number of hours has produced a long-term benefit.

Informal Observations

In order to obtain some impression of the outcomes for a true nonremediation versus a remediation situation, the researcher compared the data collected on the five subjects in group 1 who received no special remedial help with the five subjects in group 2 who received the longest periods of clinical individualized remedial treatment. In group 1, it turned out that three of the five subjects graduated from high school and all but one had repeated at least one grade. The two who dropped out of school had each repeated two grades. Four subjects had received further job training after leaving school. Four were employed and one was attending university. Two of the subjects were working in their father's business, one was a clerk and the other was working in an auto body shop. The mean value of these occupational statuses was 36.32 as measured by the Blishen Occupational Scale. The subject

who was attending university came from the highest socioeconomic background, but his problems appeared to have escaped notice because he was one of ten children in his family. Although he experienced reading and writing difficulties throughout his schooling he showed no signs of frustration and managed quite well because of his good intelligence and outgoing personality. Three of the five subjects seemed to be well adjusted, while two retained their childhood shyness and lack of self confidence. Only the subject who was least socially active chose reading as a leisure activity, while the other four read only when necessary for information purposes regarding their work.

In the case of the group 2 subjects, three of the five graduated from high school, one dropped out in grade 10 because of age and maturity, and one was still a high school student having languished in special education classes and had reached only grade 10 after 14 years of schooling. Three of the five had repeated at least one grade. Two had received further education and job training after leaving school. Three were employed, one as a government civil servant, one a retail store manager and a third was employed part time in the navy reserve and also worked on a university program to become a science teacher. The mean value of occupational status for this group was 51.55. One subject was repeating grade 12 even though he had achieved a pass, in order to upgrade his marks to meet university entrance requirements. All

subjects in this group had reading disabilities considered to be severe, and all came from low to upper middle-class socioeconomic backgrounds. The three subjects pursuing educational goals were still experiencing frustration because of reading and writing difficulties that had persisted since childhood, but all were continuing to persevere. Three of the five seemed well adjusted socially and psychologically. The university student had retained his childhood shyness but was consciously attempting to overcome it by engaging in social activities in order to make friends. The subject still in high school was reported by his mother to be still easily frustrated, shy, unhappy, fearful, suffering from poor self-esteem and socially isolated and withdrawn. All five subjects were reading often to very often for information. One reported that he did so much reading in connection with his job that he seldom chose to read in his leisure time. Three of the others read at least fairly often for pleasure while one read very often.

These findings were interesting because the results of the statistical analysis were upheld. It can realistically be anticipated that providing reading disabled children with individualized remediation will help them develop their potential by enhancing their career opportunities and by fostering greater application of reading skills in their adult daily lives.

Examination of the characteristics of the eight subjects from the total sample who dropped out of school revealed some interesting facts. It was observed that there were four subjects who dropped out in each of the two groups, but that the percentage of dropouts in group 2 was less. All came from lower middle-class socioeconomic backgrounds and were in the IQ range from 90 to 100. While all had moderate to severe reading disabilities, they were no worse than many of the other subjects who did complete their schooling. Five of the eight had spent years in special education settings where they made little progress. There was a noticeable pattern of grade repetition and promotion because of age. Only two had received no remedial help. Four had attended the reading clinic for varying periods. All except one had taken some job training course at a trade school or an adult upgrading centre. All had been successful in finding jobs but only one was employed in the workfield for which he had trained.

Based on these observations it was concluded that whether learning disabled children achieve high marks, attain high grades and remain in school until graduation, appears to be dependent primarily on their IQ and their socioeconomic background. Wigfield and Asher (1984) assert that normal children from lower socioeconomic status homes perform less well in reading than children from middle-class homes. In holding lower achievement

expectations and occupational aspirations for them, lower-class parents limit the educability potential of their children. In the case of learning disabled children, the probability of not graduating appears to increase with the severity of the disability. These findings are consistent with those of the Bruck (1985) study. She suggests that follow-up studies showing poor outcomes for LD children are probably reflecting the effects of lower class backgrounds more than learning disabilities as such. These characteristics appear to apply to learning disabled children irrespective of whether or not they receive remediation to ameliorate their problems. There was no evidence in the findings to suggest that repeating grades or full time placement in special education classes for slow learners have any beneficial effect.

It appears that many remedial programs are terminated when children demonstrate significant reading improvement as measured by standardized tests. It actually takes much longer to remediate spelling problems, and while reading is improved, writing fluency is rarely achieved. Those children who pursue higher educational goals often continue to experience frustration with these persistent symptoms of disability. It seems that the sooner they leave school and find jobs the sooner learning disabled individuals overcome shyness and frustration caused by reading problems that are emphasized during schooling. Parents from higher-class backgrounds who insist on having

their children stay in school until graduation and then proceed to some higher educational program prolong the period of dependence on them, but there is evidence that the eventual occupational outcomes for these children are enhanced.

Implications for Educators

This study was successful in demonstrating that some long-term benefits of remediation do accrue for reading disabled students. Those who receive remediation are more successful on entry into the job market, and the longer the treatment is provided, the better the job placement is likely to be and the likelier it is that they are going to read more both for information and pleasure. While these two benefits were the only ones that could be demonstrated statistically by this study, it may well be that, given certain conditions, remediation might also be reflected in higher marks, more grades completed, graduation from high school and greater likelihood of obtaining higher post secondary education. It may also be that many of the psychological problems associated with learning disabilities could be avoided, thus enabling disabled children to enjoy a more satisfying and productive preparation for adulthood through their schooling.

Based on conclusions reached from both statistical and informal analysis of the data, it is suggested that there are implications for educators that may maximize the value of reading remediation. These involve promotion of increased knowledge on the topic of learning disabilities in both parents and teachers and the improvement of the quality of educational programming for learning disabled children.

First the importance of early identification and diagnosis of learning disabled children is stressed. The evidence in this study was clear that early diagnosis generally led to early intervention. The implication here is that teachers must be knowledgeable about learning disabilities and alert for recognition of symptoms. Too frequently in the teachers' comments on the student cumulative records it was noted that clearly identifiable symptoms of learning disability were being observed but misinterpreted because they were not recognized. For example, one child received no special help in school although the following comments were noted. The child was a slow, messy worker with communication problems in writing and speaking in the early grades. He had severe spelling problems and became nervous when not sure what to do. In later grades he was reported to be knowledgeable and intelligent despite these problems. When seen for diagnosis at the Unit this group 1 subject's WISC IQ measured Full Scale 112, Verbal 104, and Performance 118.

Another child whose WISC IQ measured Full Scale 94, Verbal 82, and Performance 103, was reported by one of his primary teachers to be well suited for special education classes since he was a slow learner, inattentive, withdrawn and resentful in attitude. Low marks were attributed to carelessness, indifference and poor study habits.

A third child whose WISC IQ measured Full Scale 109, Verbal 97, and Performance 120, was not referred to the Unit until grade 2 although his kindergarten teacher had made the following kinds of comments. This child is very sensitive, cries when criticized, is easily distracted,, needs to develop listening skills, daydreams, doesn't integrate with classmates and plays alone with Lego blocks. These three examples are representative of many other learning disabled children in this study and in the general school population who could have benefited from identification and diagnosis of their symptoms.

The point being made here is that it is useless to observe symptoms and do nothing about them. It is the teacher's responsibility to see that the child's problems are referred to appropriate school personnel for diagnosis. Many of these diagnoses can be conducted and recommendations made by school personnel. Usually it should be necessary to refer only severely disabled children for clinical assessment.

A second important implication is that early intervention should follow identification and diagnosis. It is well recognized that the earlier remediation measures are taken, the greater is the likelihood of success. If children are not acquiring basic skills in their regular school program, they must be taught using a special program designed to meet their individual needs. This procedure can prevent the onset of the negative cycle of events leading to the development of poor self concept, behavior problems, emotional disturbance, dislike for reading and a defeatist attitude that greatly aggravates the presenting reading problems. There is no doubt that prevention of these additional problems is easier to effect than is a cure. If a child's disability is mild, remediation can be carried out in the classroom by the child's teacher. Problems of greater severity will require the specialized services of a remedial reading teacher, or clinic instructor. Overall, in the questionnaire comments of parents and cumulative record comments of teachers, there appeared to be a consensus that although some remedial help was being given, the learning disabled children in the study required more individual attention than the regular classroom teacher could reasonably be expected to supply. Several parents used the study questionnaire as a vehicle to voice their concerns. One parent's comment is quoted here as an example.

> It was very frustrating teaching my child spelling and reading. He was a pleasant child but a dreamer. I think his work all up through school was affected by the fact he was not a good reader. I think this makes children lose their confidence in themselves and has a great effect on their other school work. It creates a lot of trouble in the home for children doing homework and so much trouble for them at school if the child cannot keep up with his classmates. I think it has a lasting negative affect on the child all through school and obviously affects his career in life. The schools do not have enough reading teachers to give the child enough time to make a real difference. I think it's not fair to many of our children who I feel will never reach their full potential simply because they could not read well enough. I hope some improvements can be made in this area. Good luck in your very important work.

One teacher's comment read, "This child badly needs help from someone". It is an ongoing challenge and responsibility for schools to provide remedial personnel and ensure that space is allocated in the school for a specially equipped room where learning disabled children can be seen by a remedial teacher for individualized instruction.

The needs of learning disabled children can best be met by using a team approach that should involve the class teacher, remedial teacher, guidance counsellor, the school principal or vice-principal and the parents. There were several instances in the study where there was evident disparity between parents and teachers as to the nature of children's problems. In several instances cumulative records revealed that considerable effort had been taken to provide remedial help for children of which the parents seemed unaware. At times a general lack of parent and

teacher communication was reflected that proved detrimental to the children. Where there was full co-operation between home and school, the prognosis for the children was better.

Following a diagnostic assessment by either clinic or school personnel, it is very important that both parents and teachers receive an explanation of the nature of the child's problems and that strategies to use in providing remedial programming be recommended. This is particularly helpful for parents so that they gain reassurance that their child's school problems are not a sign of poor intelligence or emotional disturbance. Thereafter, parents should be encouraged to visit the school several times a year to consult with teachers and discover ways that they may facilitate their child's progress in the home. When LD children observe that both parents and teachers are co-operating on their behalf, they are able to relax and adopt more positive attitudes toward reading and learning in general. All members of the learning disabled child's team should modify their demands, pool their ideas and contribute their talents to ensure success of the remedial program.

The most obvious finding of the study was that the length of treatment is the most significant factor influencing long term outcomes. The length of treatment will be primarily determined by the severity of the disability symptoms, but in any case, the longer the

remediation is provided the better will be the outlook for the student. The researcher's review of the relevant literature indicated that it is generally accepted that severe childhood reading disability is a chronic problem in that symptoms are likely to persist as handicapping conditions throughout the schooling period, with vestiges still apparent even in adulthood. This implies that the goal of remediation should be to provide sufficient help to enable children to cope with the disability rather than hoping it will disappear all together.

Balow (1965) reported that remedial reading instruction produces substantial gains while the pupil is actively receiving assistance and that the progress continues after the remedial period but at a slower rate than for normal readers. This study indicated that almost invariably the improved marks during remediation began to fall off again after a year or two and thereafter remained fairly stable at this lower level. Sometimes the marks continued downward for the most severely disabled after entrance to junior and senior high school necessitating the resumption of clinical remediation. These findings attest to a long-term stabilizing feature of remediation, but also imply that in order for the improvement to be maximized, the remediation must be continued beyond the point where reading scores approach expected grade level. It needs to continue until there is also demonstrable improvement in spelling and writing fluency. At the

clinical rate of one hour per week this can take several years depending on the severity of the disability. Clearly more intensive remediation is needed. When clinical sessions are terminated some remedial support should be continued by the school, and in some cases continued progress will require tutorial help throughout schooling.

The learning disabled children who were the subjects of this study were seen for diagnosis at the clinic during the period 1971 to 1981. The parent comments on the questionnaire revealed that the most debilitating feature of these children's learning disabilities involved the damage done to their self-esteem resulting from repeated failure to cope with their regular school programs. It appeared that while reading problems were unavoidable, the worst suffering occurred because of emotional problems that could have been prevented. Several parents explained that it was impossible to describe on paper the anguish they had experienced in trying to help their children in their struggle to get their education.

These characteristics typify the majority of the subjects as they were in childhood. They were easily frustrated, unhappy, unable to work independently or do their homework. They did not seem to be able to accept personal responsibilities and were not socially well accepted by peers. With time they showed increasing shyness and poor self-esteem. Those who worked in the

clinical setting providing remediation services for these children realized that often the greatest benefits resulting from remediation involved the rehabilitation of damaged self-concepts. It soon came to be recognized that it was the interaction between instruction and self-concept enhancement that produced long-term benefits. The summary of one case study is presented below as an illustration of how successful remediation efforts can be.

Don was referred to the D and R Unit at age 14 because of reading and writing problems that had adversely affected his progress in school since grade 3. He had repeated grades 5 and 7 and was in a special education class for slow learners at the time of referral. He received 26 one hour individualized remedial sessions at the Unit.

In her comments on the questionnaire, his mother explained that it was hard to say who was the more frustrated, herself because of seeing this child who was always so bright and inquisitive as a preschooler fall so far short of what he was capable of achieving, or Don, who was totally frustrated with his inability to deal with the work he faced each day. Socially active and imaginative until he began failing in reading, after grade 3 he withdrew from playmates, felt inferior and developed a permanent chip on his shoulder that made himself and the whole family unhappy. He had always had the type of personality who liked to be best at everything so he was

unable to adjust to failure. Characteristics used to describe him both at home and in school prior to remediation were that he was easily frustrated, sullen, unhappy, anxious, disruptive, defiant and given to excessive anger. He was unable to work independently, or accept responsibility. He was not accepted socially by peers and demonstrated a very poor self-image.

At the time of referral he explained that he got by in school by working closely with another learning disabled classmate. They had worked out a system whereby the girl companion read the words that Don couldn't read and that he then explained the meaning of the passage which she couldn't comprehend. He explained that their two brains equalled one good brain. It was explained to Don that since he could understand the meaning of material read, he must be intelligent and that his problems could be remediated by teaching him how to read the words.

A program was designed to enable Don to read material of interest to him which concentrated on getting the meaning from whole sentences rather than struggling over isolated words within the sentence as he had been doing previously. He was given training in basic phonic skills to aid him in word identification to be used when predictions based on meaning failed to produce the desired word. He usually answered comprehension questions orally so that he could utilize his ability to express himself verbally. When he had satisfied his instructor and

himself that he knew the answers, he then worked at producing written responses to some of the same questions in order to gain the necessary practice to improve his writing ability.

Don's mother gave the following evaluation of the remediation program. He had one to one instruction with a teacher who did not criticize or yell. His problem was quickly identified and worked on. His self-confidence took a big jump which helped him to tackle a regular grade 9 program with only a grade 6 diploma. He passed that grade, and every other grade thereafter. He was helped to recognize that his problems had been made worse by his own attitude of resentment. Since then he has made friends, acquired an excellent job, is very self-confident and has become a very responsible adult, content with his lot.

This case study illustrates the beneficial effects of remediation and at the same time implies that there are certain treatment considerations that must be implemented in both regular classroom instruction and remedial classes if the future outlook is to be brighter for children with reading disabilities. These treatment considerations are stated as follows.

1. Retraining must take place through the use of the child's cognitive strengths, emphasizing these rather than deficit areas at first.
2. Once the child has begun to experience success using areas of strength, remediation of the

deficient areas can begin. It is usually at this stage that phonetic and structural analysis can be emphasized with children who experience difficulty with letter/sound correspondence and segmenting words.

3. The child must be permitted to work at the level indicated by achievement tests rather than on material normally presented for the child's age group. This is where the advantage of a clinical setting becomes apparent, because in this situation peer competition is removed and additional teacher assistance can be provided. Mild and moderate disabilities usually can be handled in a remedial setting within the school.

4. Teachers in the regular classroom should modify their demands upon the child in the deficient areas and give praise for successful accomplishment even if it is not at an age-appropriate level. The possibility of failure should be reduced to a minimum.

5. Parents and teachers should focus on reducing commands, punishment, and negative interactions while increasing encouragement and positive attention. Reasonable time limits should be set for task accomplishment, and rewards and privileges given for accuracy and neatness of completed assignments. This should compensate

for previous experiences of failure and motivate the child to show more interest in reading and in school in general. There should be continuous evaluation of progress and changes made in treatment procedures where needed.

The welfare of learning disabled children depends on the sympathy and understanding of the significant others in their lives. The implication here is that parents and educators must be knowledgeable about learning disabilities in order to be helpful. This continues to apply through adolescence when University professors can do much to facilitate their students' progress through their courses.

It is generally agreed that children are a country's greatest resource. Learning disabled children are no exception. They need to be shown acceptance for what they are and respect for what they can become. It is understood that resources have to be developed in order to become productive. Learning disabled children need remedial services to foster their development. The findings of this study imply that investment of expertise and capital to provide these services is justified and should be continued.

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APPENDIX 1

Diagnostic Report

Group 1

PSYCHOLOGICAL REPORT

NAME: David DATE OF BIRTH: October 25, 1964

ADDRESS:

SCHOOL: GRADE: 3

PLACE OF TESTING: Learning Center, Memorial University

DATES OF TESTING: March 29, 30, 1973

EXAMINER:

TESTS ADMINISTERED:

1) Durrell Analysis of Reading Difficulty
2) Frostig Developmental Test of Visual Perception
3) Illinois Test of Psycholinguistic Abilities
4) Northwestern Syntax Screening Test
5) Sentence Repetition Test
6) Target Test
7) Trail Making Test
8) Auditory Discrimination Test
9) Benton Visual Retention Test
10) Benton Imbedded Figures Test
11) Gibson Figures Test
12) Wide Range Achievement Test
13) Peabody Picture Vocabulary Test

DISCUSSION:

David was referred to the Learning Center for psychological assessment because some difficulty has been noticed in the development of his ability to read. He is presently functioning at an average level of intelligence, as assessed by the WISC, with a verbal I.Q. of 110, a performance I.Q. of 101 and a full scale I.Q. of 107.

Achievement tests administered at this Institute suggest that while David is performing above his grade level in arithmetic (Grade 4), his performance in reading and spelling are still at the Grade 2 level.

The following are his scores on the Durrell Analysis of Reading Difficulty:

Reading Rate	- Oral	Low Grade 3 level
	- Silent	Low Grade 2 level
Comprehension	- Oral	Good at Grade 4 level
	- Silent	Low at Grade 2 level
	- Listening	Good at Grade 3 level
Word Recognition		High Grade 1 level
Word Analysis		High Grade 1 level
Visual Memory of Words		Mid Grade 2 level
Hearing Sounds in Words		Grade 3 level

This profile indicates that the central difficulty in reading appears to be in tasks in which no vocal cues are present, ~~e.g.~~ silent reading, word recognition, visual memory of words.

A battery of psychometric tests were administered to David to determine whether or not inadequate development in some perceptual areas could underlie the observed discrepancies in school performance noted above. Two tests of visual perception proved to cause him particular difficulty: 1) the Target Test, a test of moving visual retention, and 2) Visual Sequential Memory on the ITPA. It should be noted that these two tests measure roughly the same abilities, short-term sequential visual retention, and that all other test scores were average or above average, particularly tests of auditory skills. It appears likely, therefore, that the aforementioned achievement difficulties are directly related to this particular perceptual difficulty.

In summary, David is a boy of average intellectual ability who is achieving at below his grade level in silent reading. Sequential visual retention is also below average for his grade level and is likely indicative of the difficulty in silent reading and recognition of words. The following recommendations are being made:

1) David's teacher and parents should be notified of his problem so that they can provide assistance wherever possible in the areas where his development has been slow. They should be clearly informed that these difficulties are not very serious but that correction depends on the problem being immediately tackled and not being ignored.

2) David needs to have practice on exercises which will provide auditory cues for the visual components of reading. It is suggested that such things as oral reading be accented for some time - perhaps at the whisper level while he is in the classroom. Practice on flashcard reading is also recommended. It is expected that after some time oral cueing can be suspended - retesting should be requested before this is done, however.

3) A booklet of visual exercises is included for recommended practice. Of particular note are the searching or tracing tasks (Page 4), visual memory and sequencing tasks, (Page 11-13) and auditory-visual tasks (Page 14-16).

APPENDIX 2

Diagnostic Report

Group 2

DIAGNOSTIC AND REMEDIAL UNIT
BOX 30
FACULTY OF EDUCATION
MEMORIAL UNIVERSITY, ST. JOHN'S NEWFOUNDLAND
TELEPHONE: (709) 737-8660-1
A1B 3X8

NAME: Micky

DATE OF BIRTH:

HOME ADDRESS:

HOME PHONE NO.:

SCHOOL:

GRADE: 5

REFERRED BY: Parents

TEACHER:

DATE OF REPORT:

REPORT:

Micky has been seen for combined diagnostic and remediation sessions at the Diagnostic and Remedial Unit during the period from February 5-March 19, 198.. He was referred because of reading difficulties that are adversely affecting his progress in all subjects where study of textbooks is required. These difficulties have been apparent since the early primary grades. Testing at the Unit was conducted to determine whether Micky's level of progress is in line with his intellectual potential and to pinpoint specific areas of concern that might be relieved through remediation. He was accompanied to the Unit by his parents who have both viewed portions of the sessions.

Micky presented as a friendly dark-haired boy of average build for his age. He related well with the examiner and gave full attention and cooperation throughout the testing. The results, therefore, should give a fair estimate of his present capabilities.

The following tests were administered:

Test of Visual Motor Integration (VMI)

This is a copying of design test which is used to determine whether any visual-perception or eye-hand coordination difficulties are present that might hinder learning. It is a good predictor of the degree of difficulty a student will have in learning handwriting skills.

Resul[illegible]

Micky scored at the 46th percentile on this test which corresponds to an age equivalent of 9 years 11 months compared to his chronological age of 10 years 3 months. This indicates slightly below age level ability in this area. He is right handed but has not established eye dominance. When looking to the left, his left eye is dominant but when he looks to the right, there is a tendency toward right eye dominance.

Wepman Auditory Discrimination Test

This test is used to determine a student's ability to recognize the fine differences that exist between the phonemes used in English speech. It measures the ability to hear accurately.

Results

Micky scored at "+2" level, indicating a very good development in this skill.

Wepman Sequential Memory Test

This test measures a student's ability to recall the exact order of an auditory stimulus. The student is asked to repeat lists of numbers of increasing length.

Results

Micky scored at "-2" level, which indicates ability below the threshold of adequacy in this area. He had difficulty recalling the number sequences beyond three digits. He also had difficulty recalling the patterns of a Tapping test.

Wepman Auditory Memory Span Test

This is a test of a student's ability to recall single syllable spoken words in progressively increasing series.

Results

Micky scored at "-2" level, indicating significant difficulty with auditory memory. He did better with an auditory blending test, a skill considered important when one is learning to read using a phonics approach. He is much better able to recall meaningful sentences than series of words in isolation.

Wide Range Achievement Test (WRAT-R)

This test is used to assess the basic school subjects of reading, (word recognition and pronunciation) written spelling, and arithmetic computation.

Results:

	Grade Equivalent	Percentile Rank	Standard Score
Reading	3E	25	90
Spelling	3B	14	84
Arithmetic	4E	37	95

Micky lacks a natural affinity for both word identification and spelling, so that beyond the limited number of words that he has committed to memory, he has no workable word attack skills to help himself in these two related areas.

In Math, the basic conceptual background is good, but he is presently greatly hampered in calculating because of difficulties in learning the multiplication tables. Multiplication and division sums are particularly difficult for him.

Peabody Picture Vocabulary Test (PPVT-Form L)

This test is designed to provide an estimate of students' knowledge of word meanings through measuring their hearing vocabulary. It measures "receptive" as contrasted to "expressive" language.

Results:

Micky's score indicates an age equivalent of 11 years compared to his chronological age of 10 years 3 months. This places him high in the average range for persons of his age in receptive language development, so that he should be able to comprehend the meaning of sentence vocabulary at his Grade level.

Peabody Individual Achievement Test (PIAT)

This is a standardized screening test of academic skills in Spelling, Reading Comprehension, Math and General Information. It is an untimed test, and for the most part, presented in a multiple choice format.

Results

Subtest	Raw Score	Gr. Equiv.	Zile Rank	Std. Score
Math	56	8.6	87	117
Reading Recognition	38	4.1	24	89
Reading Comprehension	29	3.1	10	81
Spelling	44	4.6	40	96
General Information	54	7.8	85	116
Total Test	224	5.1	43	97

Comparing the PIAT scores with the WRAT scores it can be clearly seen that Micky's ability to think logically and do mathematical reasoning in his head, is far in advance of his ability to do calculations involving the use of multiplication tables to compute. Addition and subtraction appear to be well established, multiplication procedure is correct, however, the procedure in division is not clearly understood, and is further hampered because the tables are not automatic.

Reading recognition is in the ending Grade 3, beginning Grade 4 range, representing a lag of more than a year behind the level expected mid way through Grade 5.

He is better at recognizing correct spelling (PIAT) than producing correct spelling himself (WRAT).

Silvaroli Reading Inventory (SRI)

This test estimates a child's independent, instructional, and frustrational level for materials read both orally and silently. It also assesses a child's listening capacity, word recognition and comprehension abilities.

Results

	Independent	Instructional	Frustration
Oral Reading	3-4	5-6	7 and beyond
Silent Reading	3-4	5	6 and beyond
Listening	6-7	N/A	N/A

Micky's comprehension is best when he is reading orally from selections where he has some experiential background and the topic is one of interest to him. In this situation he is able to make use of context clues and get the main idea despite the multiple miscues. When the topic is unfamiliar he loses track because of word identification problems.

When reading silently there is continual lip movement and subvocalization indicating that to him, silent reading is really oral reading in a low voice. The idea that he can take in several words at a

glance apparently is unknown to him, or if known is certainly not practised. As the material became more difficult, his speed tended to increase while comprehension declined. He explained that he had to go back and reread paragraphs because he had not remembered the information.

His listening skills are adequate up to and beyond his present grade level which is a strength that he should utilize to the best of his ability in class.

He was able to give a fairly good written recall of a Grade 5 passage read silently, listing 6 out of 12 facts. He was assured that he did not have to worry about spelling errors as information was what was required. He made only four errors in four sentences.

His written recall of a Grade 6 level passage revealed that he did not understand entirely what he had read. This was partially because he read "waiting" as "weighing". Even though this miscue made no sense in the context of the story, he accepted it and lost all track of the last paragraph.

As he was reading orally, it was possible to observe his meaning seeking strategies in operation. "At the ridiculous age of 59 when a man ought to know better, I became a qualified competitor on the Cresta Bobsled Run." Micky began - "At the ri, ri, ri, ri, ri,", and would have gone on indefinitely had he not been told to read on past the unknown word and figure it out from the rest of the sentence. He then predicted that the unknown word should be "crazy". He was told that he was close in meaning, but to look next at the appearance of the word, and try to sound it out from the beginning, remembering that the word he needed meant something similar to "crazy". He came up with "ridiculous" after only a few seconds. He was then told to use this strategy whenever he comes to a word he does not know.

When he encounters several multi-syllabic words in a single sentence, he becomes discouraged because he has no word attack approach and loses track of the meaning even though he realizes the passage is supposed to make sense. As his present level of skill development cannot carry him far beyond the point he has reached, he will need intervention in the form of very structured word attack skill building coupled with comprehension strategies. As his spelling shows the same haphazard approach as word identification, he will need help here as well.

During informal testing, Micky was asked what reading meant and he answered - "To read, you use your brain, think and look at the words." This, in effect, is what he tries to do. He was also asked to list the letters of the alphabet in order in printing and written forms. This was done slowly and hesitatingly with confusion apparent in five written capitals and two lower case letters. Having observed this student in the working situation, it is the impression of this examiner that Micky may have begun school a bit too early, and introduced to the reading process before he

was ready to handle it. A lot of his present uncertainty stems from a poor grasp of the basic foundation skills that were presented in the early primary grades.

In addition to the academic achievement testing, intelligence testing was also conducted. In this area the tests administered were:

Raven's Standard Progressive Matrices

This is a test of reasoning and logical thought development that is not dependent on language abilities. The student must solve a series of puzzles that are dependent on reasoning and visual perceptual abilities.

Results:

Micky placed at approximately the 75th percentile for 10 year olds. This places him at level "III+" indicating logical reasoning ability within the average range.

Wechsler Intelligence Scale for Children - Revised (WISC-R)

This is the most commonly used test to assess children's intelligence. It consists of 10 subtests - 5 verbal, which require answers to questions of general information, categorization, and mental arithmetic, etc.; and 5 non-verbal or performance task subtests which assess reasoning through solution of puzzles, block patterns and like material.

The Verbal Scale is dependent on the student's accumulated experience and usually requires an automatic response to what is already known. The Performance Scale is more dependent on the student's immediate problem solving ability and requires the student to meet new situations and apply past experience and previously acquired skills to a new set of demands.

Results:

Micky's intelligence classification falls within the average range. In depth interpretation of the results of this test indicates that there is a significant anxiety factor present that is having a detrimental affect on his performance. Error analysis indicates a tendency toward difficulty in cursive writing, learning from abstract visual presentations such as maps, handwriting, spelling, punctuation, and math. It is recommended that soft verbalization aloud will aid error reduction when reading for detail, doing math problems, copy and written work, and analysis of visual presentation. A positive inclination is indicated toward language presentation of math, and good concentration for verbal presentation. It was earlier noted that Micky can hold auditory presentation much better when it is in fully meaningful sentences as opposed to unrelated items. Oral presentation of instructions may be difficult for him, as well as memorization of

lists. It may be better to present instructions while he has the materials involved to manipulate or can look at a meaningful visual format, or instructions should be written.

Summary and Recommendations

Micky is a boy of average reasoning abilities, but he cannot always put them to use because of some disability in the area of auditory sequential memory, and rote memory of numbers and symbols generally. He also has some difficulty seeing patterns. Because of this he must memorize all words as he cannot see spelling patterns. All multiplication facts have to be memorized one by one instead of seeing patterns that simplify the task, so with rote memory problems added, that is why he has such difficulty and feels like giving up. Also he does not always group ideas together to form patterns of thought. For example, he was able to tell that an apple, orange and a lemon are alike because they are fruit, but said that a cap, shirt and sweater are alike because they might all have buttons.

Holding in the mind several things at once, remembering and integrating them are part of math. Besides having difficulty committing the multiplication facts to memory, he cannot remember the sequence of steps required to divide, and has trouble switching from one process to another, such as dividing, multiplying and subtracting in long division. This has been further complicated because in their well meaning efforts to help him, his parents have been demonstrating another method than the one being used in school. He therefore now has two methods that he does not understand. It is recommended that his math teacher go over the process with him step by step until understanding takes place. Also, he should be permitted to have a copy of the tables on his desk whenever he is working at math.

With regard to the reading, it is recommended that remedial sessions be continued at the Unit for the remainder of this school year so that word attack skills can be taught and comprehension strategies practised. This will take more instruction time than the regular class teacher can reasonably be expected to provide.

Basically, in his school environment, Micky needs understanding of his problems, and a working atmosphere that will allow him to make mistakes without fear of reprimand or ridicule. Often, though he may appear not to be, he is trying, and sometimes he is doing the best he can when it seems like he is not. The same patience and understanding are required in his home environment as well, with siblings particularly being encouraged to be supportive and kind.

Academic success is dependent upon the acquiring of the foundations, and the maturation necessary for mastery. Motivation is an essential component, and must be nurtured through successful experience. Success breeds success. In every tangible way, Micky needs to be programmed for success and pleasure in learning. Nothing is more effective than experiences

that produce in him a feeling of "I can do it!"

The testing has shown, that though Micky has some learning problems, he has plenty of potential. There remains the educational task of seeing that he gets the maximum chance to develop it.

Respectfully submitted,

_____

Remedial Instructor
Diagnostic & Remedial Unit

APPENDIX 3

Letter of Request to Parents

and

Parental Questionnaire

Group 1

MEMORIAL UNIVERSITY OF NEWFOUNDLAND
St. John's, Newfoundland, Canada A1B 3X8

Faculty of Education
Diagnostic & Remedial Unit

Telex: 016-4101
Telephone: (709) 737-8660/1

Dear

Our records indicate that your child was seen for assessment at the Learning Center on

I am a remedial instructor at the Diagnostic and Remedial Unit and am presently doing a follow-up study of children who attended the Unit for assessment when Dr. Barnsley was Director. At that time there was no remedial service offered.

Since 1973, the renamed Unit has been offering one-to-one remedial assistance to children with reading problems. By comparing the progress of children who have been referred for assessment but received no remediation with those who have received remediation here, I am hoping to determine whether this remediation has any long term positive effects on the children concerned as they proceed with their education.

You can greatly assist me in this project if you will fill in the enclosed information sheet and return it to me at the Diagnostic and Remedial Unit in the self-addressed stamped envelope.

Your cooperation in this survey now may be the means of helping other children with learning disabilities get the individualized help I believe they need. Thank you.

Yours truly,

Gertrude Andrews
Remedial Instructor
Diagnostic & Remedial Unit

GA/efm

Encls. 2

MEMORIAL UNIVERSITY OF NEWFOUNDLAND
St. John's, Newfoundland, Canada A1B 3X8

Faculty of Education
Diagnostic & Remedial Unit

Telex: 016-4101
Telephone: (709) 737-8660/1

Follow Up Survey

Name: _____ Date of Birth: _____ Age: ____

Present Home Address: _____

Home Telephone Number: _____

Names of Parents: _____

Age at School Entrance: _____

Attended Kindergarten: _____ Yes/No Preschool: _____ Yes/No

Schools Attended (in order): _____

_____

Grades repeated (if any): _____

Grade completed at school leaving: _____

Age at school leaving: _____

Further Education/Job Training: University _____

Trade School _____, Other _____

Comment on training received: _____

_____

Present Occupation: _____

The learning problem was in: Number, Letters, Reading Writing, Spelling, Behavior, Speaking (Underline problem areas).

Description of the problem as you saw it: _____

_____

_____

When was the problem first noticed? _____

Is the problem still present today? _____

Pertinent History

Remedial help received at school, (if any): _____

_____

Private tutoring, (if any): _____

_____

Was there a referral to any of the following?

1. Mental Health Division _____
2. Child Health Services _____
3. Janeway Health Centre _____
4. Social Services _____
5. Other (please specify) _____

If yes, how has one or more of these helped? _____

_____

_____

Medical Record

Eyes Examined: Yes/No _____. If yes, When? _____

Where? _____ Result? _____

Ears Examined: Yes/No _____. If yes, When? _____

Where? _____ Result? _____

Comment on health background as the cause of any long absences from school: _____

_____

_____

_____

The following are social, personal, and behavior difficulties which are sometimes related to learning problems. Check those which you think described your son as a younger child.

_____ Easily frustrated	_____ Shy
_____ Uncooperative	_____ Unhappy
_____ Excessive Anger	_____ Fearful
_____ Fights Frequently	_____ Anxious
_____ Sullen	_____ Disruptive.
_____ Depressed	_____ Defiant
_____ Destructive	_____ Withdrawn

_____ Unable to work independently or do homework

_____ Does not accept personal responsibilities

_____ Cannot predict consequences of personal behavior

_____ Not socially accepted by peers. Prefers younger playmates.

_____ Poor self-esteem or self-image

What effects, if any, have your son's problems had on his life and the family's while he was growing up? _____

Using the list of difficulties on page 3 as a guide, describe any changes your son has shown both in personality and in ability to cope with his problems as he has grown toward maturity.

Circle the item that best describes your son's present reading habits:
reads for information: very often, often, fairly often, seldom, never
reads for pleasure: very often, often, fairly often, seldom, never

List the social and recreational activities in which your son takes part. (This would include sports, youth groups, church groups, service clubs or others you might know.)

1. _____
2. _____
3. _____
4. _____
5. _____

In order to complete the survey I will need to examine your son's school Cumulative Record. As he is now of legal age, the school requires his permission for me to do this. Please have him sign the enclosed permission form and return it along with the completed Follow Up Survey.

Thank you very much for your cooperation and assistance in this survey.

APPENDIX 4

Letter of Request to Parents

and

Parental Questionnaire

Group 2

MEMORIAL UNIVERSITY OF NEWFOUNDLAND
St. John's, Newfoundland, Canada A1B 3X8

Faculty of Education
Diagnostic & Remedial Unit

Telex 016-4101
Telephone: (709) 737 8660/1

Dear

Our records indicate that your child was seen for assessment and one-to-one remedial instruction during the period

In my position as Remedial Instructor at the Diagnostic and Remedial Unit, I am presently doing a follow-up study of children who have attended the Unit since it first opened in 1971 under Dr. Barnsley. At that time it was called the Learning Center, and offered assessment only without any remedial services.

Since 1973, the renamed Unit has been offering one-to-one remedial assistance to children with problems in reading. By comparing the progress of children who have been referred for assessment but received no remediation with those who have received remediation here, I am hoping to determine whether this remediation has any long term positive effects on the children concerned as they proceed with their education.

You can greatly assist me in this project if you will fill in the enclosed information sheet and return it to me at the Diagnostic and Remedial Unit in the self-addressed stamped envelope.

Your cooperation in this survey now may be the means of helping other children with problems in reading get the individualized help I believe they need. Thank you.

Yours truly,

Gertrude Andrews
Remedial Instructor
Diagnostic & Remedial Unit

GA/efm

Encls. 2

MEMORIAL UNIVERSITY OF NEWFOUNDLAND
St. John's, Newfoundland, Canada A1B 3X8

Faculty of Education
Diagnostic & Remedial Unit

Telex: 016-4101
Telephone: (709) 737-8660/1

Follow Up Survey

Name: _____ Date of Birth: _____ Age: _____

Present Home Address: _____

Home Telephone Number: _____

Names of Parents: _____

Age at School Entrance: _____

Attended Kindergarten: _____Yes/No Preschool: _____Yes/No

Schools Attended (in order): _____

_____

Grades repeated (if any): _____

Grade completed at school leaving: _____

Age at school leaving: _____

Further Education/Job Training: University _____

Trade School _____, Other _____

Comment on training received: _____

_____

Present Occupation: _____

The learning problem was in: Number, Letters, Reading Writing, Spelling, Behavior, Speaking (Underline problem areas).

Description of the problem as you saw it: _____

_____

_____

When was the problem first noticed? _____

Is the problem still present today? _____

Pertinent History

Remedial help received at school, (if any): _____

_____

Private tutoring, (if any): _____

_____

Was there a referral to any of the following?

1. Mental Health Division _____
2. Child Health Services _____
3. Janeway Health Centre _____
4. Social Services _____
5. Other (please specify) _____

If yes, how has one or more of these helped? _____

_____

_____

Medical Record

Eyes Examined: Yes/No _____. If yes, When? _____

Where? _____ Result? _____

Ears Examined: Yes/No _____. If yes, When? _____

Where? _____ Result? _____

Comment on health background as the cause of any long absences from school: _____

_____

_____

_____

The following are social, personal, and behavior difficulties which are sometimes related to learning problems. Check those which you think describes your son as a younger child.

_____ Easily frustrated	_____ Shy
_____ Uncooperative	_____ Unhappy
_____ Excessive Anger	_____ Fearful
_____ Fights Frequently	_____ Anxious
_____ Sullen	_____ Disruptive
_____ Depressed	_____ Defiant
_____ Destructive	_____ Withdrawn

_____ Unable to work independently or do homework

_____ Does not accept personal responsibilities

_____ Cannot predict consequences of personal behavior

_____ Not socially accepted by peers. Prefers younger playmates.

_____ Poor self-esteem or self-image

What effects, if any, have your son's problems had on his life and the family's while he was growing up? _____

Using the list of difficulties on page 3 as a guide, describe any changes your son has shown both in personality and in ability to cope with his problems as he has grown toward maturity.

Do you think that the one-to-one remedial assistance at the Diagnostic and Remedial Unit has been of help to your son? _____

If yes; please explain as freely as possible how you feel the sessions have helped him.

List the social and recreational activities in which your son takes part. (This would include sports, youth groups, church groups, service clubs or others you might know.)

1.
2.
3.
4.
5.

Circle the item that best describes your son's present reading habits:
reads for information: very often, often, fairly often, seldom, never
reads for pleasure: very often, often, fairly often, seldom, never

In order to complete the survey I will need to examine your son's school Cumulative Record. As he is now of legal age, the school requires his permission for me to do this. Please have him sign the enclosed permission form and return it along with the completed Follow Up Survey.

Thank you very much for your cooperation and assistance in this survey.

APPENDIX 5

Blishen Occupational Scale

BLISHEN OCCUPATIONAL SCALE:SORTED BY INDEX

14.39	HUNTING,TRAPPING & REL. OCCS.
18.23	FISH CANNING, CURING & PACKING OCCS.
18.62	FISHERMEN:NET,TRAP & LINE
19.24	NEWSBOYS
19.32	FORESTRY & LOGGING OCCS. N.E.C.
19.65	TEXTILE FIBRE PREPARATION OCCS.
19.77	FABRICAT.ASSEMBL.& REPAIR:WOOD PRODUCTS:I.T.G. & S. OCCS
19.91	SHOEMAKING & REPAIR OCCS.
20.31	WOOD SANDING
20.58	PRESSING OCCS.
20.63	MILLINERS,HAT & CAP MAKERS
20.73	TEXTILE PROCESS:LABOUR & OTH. ELEM.WORK:
21.71	TEXTILE SPINNING & TWISTING OCCS.
21.87	FAB.ASSEM.REP.TEXT.,FUR & LEATH.PROD.:LABOUR & OTH.ELEM.WORK
22.05	KNITTING OCCS.
22.16	FABRIC.ASSEMBL.& REPAIR.WOOD PROD.:LABOUR & OTH.ELEM. WORK
22.23	SPORTS & RECREATION,N.E.C.
22.50	TEXTILE PROCESSING OCCS.
22.74	FISHING,HUNTING,TRAPPING & REL. OCCS. N.E.C.
22.80	TIMBER CUTTING & REL. OCCS.
23.02	FARMERS
23.07	ELEVATOR OPERATING OCCS.
23.21	SEWING MACHINE,OPERATORS,TEXT & SIMILAR MATERIAL
23.22	FABRIC. ASSEMBL. REPAIR OCCS:TEXTILE,FUR & LEATHER PROD. N.E.C.
23.41	TEXTILE FINISHING & CALENDERING OCCS.
23.66	WOOD SAWING & REL. OCCS. EXCLUDING SAWMILL
23.98	EXCAVAT.GRADING.&PAVING:LABOUR & OTH. ELEMEN.WORK
24.07	RAILWAY SECTIONMEN & TRACKMEN
24.25	FARM WORKERS
24.26	LAUNDERING & DRY-CLEANING OCCS.
24.27	TAILORS & DRESSMAKERS
24.41	TEXTILE BLEACHING & DYEING OCCS.
24.43	TEXTILE WEAVING OCCS.
24.43	TEXTILE WINDING & REELING OCCS.
24.58	BABYSITTERS
24.69	WOOD MACHINING:I.T.G. & S. OCCS.
24.83	FABRIC. ASSEMBL.&REPAIR OCCS: WOOD PRODUCTS,N.E.C.
24.83	FORESTRY & LOGGING:LABOUR & OTH. ELEM.WORK
24.97	JANITORS, CHARWORKERS & CLEANERS
24.98	FURRIERS
25.06	BARBERS,HAIRDRESSERS & REL. OCCS.
25.60	PUBLIC ADMINISTRATORS & DEFENCE:LABOURERS
25.61	PAVING, SURFACING & REL. OCCS.
25.66	HIDE & PELT PROC. OCCS.
25.66	PLANING,TURNING,SHAPING & REL. WOOD MACHINE OCCS.
25.67	LABOUR & OTH. ELEM WORK,OTH. PROCESS.
25.82	CLAY,STONE PROC. & FORMING:LABOUR & OTH. ELEM. WORK
25.90	FOOD,BEVERAGE & REL. PROC.:LABOUR & OTH.ELEM.WORK
26.00	WOOD PROC. EXCEPT PULP & PAPERMAKING:LABOUR & OTH.ELEM.WORK
26.20	FARM MACHINERY OPERATORS AND CUSTOM OPERATORS
26.46	FRUIT & VEGETABLE CANNING,PRESERV.& PACKAG. OCCS.
26.49	BARTENDERS
26.50	LABOURERS,SERVICE
26.51	LOGGING & OTH. ACCOM.,N.E.C.
26.55	SERVICES:LABOUR & OTHER ELEMEN.WORK
26.65	TRANSPORT & REL. EQUIP.OPERATING OTHER OCCS.N.E.C.
26.67	FARMING,HORTICULTURAL & ANIMAL HUSBANDRY OTHER OCCS.N.E.C.
26.67	TAXI DRIVERS & CHAUFFEURS
26.70	APPAREL & FURNISHINGS SERVICE OCCS. N.E.C.
26.76	TRADE:LABOURERS
26.80	CHEFS AND COOKS

26.81	OTHER INDUSTRIES:LABOURERS
26.95	SAWMILL SAWYERS & REL. OCCS.
26.98	ROOFING, WATERPROOFING & REL. OCCS.
27.01	CONSTR. TRADES OTHER:LABOUR & OTH. ELEM. WORK
27.04	CABINET & WOOD FURNITURE MAKERS
27.11	CHAMBERMAIDS & HOUSEMEN
27.16	UPHOLSTERERS
27.20	FABRIC. & ASSEMBL.PROD.:LABOUR & OTH. ELEM. WORK,N.E.C.
27.32	SEPARATING,GRINDING,CRUSHING & MIXING OCCS:CLAY,GLASS & STONE
27.39	PATTERNMAKING,MARKING & CUTTING OCCS:TEXT.,FUR, LEATH.PROD.
27.42	TEXTILE PROCESSING:I.T.G. & S. OCCS.
27.42	PROCESS. OCCS.OTHER,N.E.C.
27.52	FOOD & BEV. PREP. & REL. SERVICE OCCS. N.E.C.
27.60	LABOURERS N.E.C.
27.68	FABRIC.ASSEMBL.& REP.TEXTILE,FUR & LEATH.PROD.:I.T.G. & S. OCCS.
27.98	FARM MANAGEMENT OCCS.
28.00	WAITERS,HOSTESSES & STEWARDS,FOOD & BEVERAGES
28.01	NURSERY & REL. WORKERS
28.03	CARPENTERS AND REL. OCCS.
28.20	GUIDES
28.44	BAKING, CONFECTIONERY MAKING & REL. OCCS.
28.62	LABOURERS:TRANSPORTATION & COMMUNICATION
28.64	CUTTING & SHAPING OCCS:CLAY,GLASS,STONE
28.70	GUARDS & WATCHMEN
28.70	PROD.FABRIC.ASSEM. & REPAIR:LABOUR & OTH.ELEM.WORK,N.E.C.
28.71	FAB.ASSEM.I.&R.EL.ELECTRON.& REL.EQUI.:LABOUR & OTH.ELEM.WORK
28.80	WOOD MACHINING OCCS., N.E.C.
28.82	SLEEPING-CAR & BAGGAGE PORTERS & BELLMEN
28.84	PAINTERS,PAPERHANGERS & REL. OCCS.
28.95	DECK CREW, SHIP
28.99	FLOUR & GRAIN MILLING OCCS.
29.02	LABOURERS, MANUFACTURING
29.05	CONCRETE FINISHING & REL. OCCS.
29.26	CLAY,GLASS & STONE MACHINING:I.T.G. & S. OCCS.
29.38	METAL MACHINING OCCS. N.E.C.
29.47	BRICK AND STONE MASONS AND TILE SETTERS
29.57	WOOD PROCESSING OCCS. EXCLUDING PULP & PAPERMAKING,N.E.C.
29.60	SERVICE OCCS., OTHER, N.E.C.
29.65	SERVICE STATION ATTENDANTS
29.73	FAB.ASSEMB.REP. RUB,PLAS.& REL.PROD.:LABOUR & OTH.ELEM.WORK
29.79	CAPTAINS AND OTH. OFFICERS, FISHING VESSELS
29.82	EXCAVATING, GRADING & REL. OCCS.
29.83	TRUCK DRIVERS
29.85	ENGINE & BOILER ROOM CREW SHIP
29.92	MATER.HANDLING:LABOUR & OTH.ELEMENTAL. WORK
29.98	ATTENDANTS,SPORT & RECREATION
30.03	HOTEL CLERKS
30.11	PERSONAL SERVICE OCCS.N.E.C.
30.13	MESSENGERS
30.32	LOG HOISTING,SORTING, MOVING & REL. OCCS.
30.33	PAINTING & DECORATING OCCS. EXCLUDING CONSTRUCTION
30.36	ABRADING AND POLISHING-CLAY GLASS STONE
30.47	PLASTERERS & REL. OCCS.
30.68	RAILWAY TRANSPORT OPERATING OCCS.,N.E.C.
30.98	MILK PROCESSING OCCS.
31.08	MOULDING OCCS: RUBBER,PLASTIC & REL. PROD.
31.12	SLAUGHTERING & MEAT CUTTING,CANNING CURING & PACK.OCCS.
31.16	PACKAGING,OCCS.N.E.C.
31.28	FORMING OCCS:CLAY,GLASS,STONE
31.32	FABRIC.,ASSEMBL.& REPAIR OCCS:RUBBER, PLAST. & REL. PROD.N.E.C.
31.39	CONSTRUC.TRADES OCCS.OTHER, N.E.C.
31.42	CRUSHING & GRINDING OCCS: CHEM & REL. MAT.
31.57	GLAZIERS
31.62	METAL WORKING OPERATORS,N.E.C.
31.87	CUTTING & FINISHING OCCS:RUBBER,PLAST. & REL. PROD.
31.87	FORESTRY CONSERVATION OCCS.

31.90	MATERIALS HANDLING EQUIP. OPERATORS N.E.C.
32.09	STREET VENDORS & DOOR-TO-DOOR SALESMEN
32.15	CLAY,GLASS & STONE & REL. MAT. MACHIN. OCCS. N.E.C.
32.15	CLAY,GLASS & STONE PROCESS FORMING & REL. OCCS. N.E.C.
32.18	OTHER PROD,FABRICAT.ASSEMBL. & REPAIR,OCCS.N.E.C.
32.23	BUS DRIVERS
32.23	FOOD, BEV. & REL. PROCESS OCCS.,N.E.C.
32.28	NURSING AIDES & ORDERLIES
32.43	LONGSHOREMEN,STEVEDORES & FREIGHT HANDLERS
32.47	PLYWOOD MAKING & REL. OCCS.
32.52	JEWELLERY & SILVERWARE FAB. ASSEMB.& REPAIR OCCS.
32.53	WOOD PROCESS EXCEPT PULP & PAPERMAKING:I.T.G. & S. OCCS.
32.54	MATERIALS HANDLING & REL. OCCS.,N.E.C.
32.62	MOULDING, COREMAKING & METAL CASTING OCCS.
32.71	EXCAVATING, GRADING, PAVINGS & REL. OCCS.,N.E.C.
32.81	MOTOR VEHICLE MECHANICS & REPAIRMEN
32.83	DRIVER-SALESMEN
32.96	FURNACEMEN & KILNMEN:CLAY GLASS & STONE
32.99	FILING,GRINDING,BUFFING,CLEAN.& POLISHING OCCS., N.E.C.
33.05	EL.POW.LIGHT.& WIR.COMM.EQU.ER.I.& R.:LABOUR & OTH.ELEM.WORK
33.07	COATING & CALENDERING OCCS: CHEM. & REL. MAT.
33.22	IND. FARM CONSTR. & OTH.MECH.EQUIP & MACH.FABR.ASSEM.OCCS.N.E.C.
33.29	MINING & QUARRY,INC.OIL & GAS FIELDS:LABOUR & OTH.ELEM.WORK
33.37	MARINE CRAFT FABRICAT.ASSEMBL.,&REPAIR OCCS.
33.39	BLASTING OCCS.
33.61	PLATING,METAL SPRAYING & REL. OCCS.
33.74	BONDING AND CEMENTING OCCS:RUBBER,PLAST.&REL PROD.
33.84	FORGING OCCS.
34.07	CHEM.PETR.RUB.PLAS.&REL.MAT.PROC.:LABOUR & OTH.ELEM.WORK
34.17	OTHER OCCS. N.E.C.
34.18	METAL PRODUCTS,OTH.FABRICAT.& ASSEMBL.OCCS.N.E.C.
34.23	TOBACCO PROCESSING OCCS.
34.35	MINING & QUARRYING:CUTTING,HANDLING & LOADING OCCS.
34.44	SHIPPING & RECEIVING CLERKS
34.51	ENGINE & REL. EQUIP. FABRICAT. & ASSEMBL. OCCS. N.E.C.
34.67	WOOD TREATING OCCS.
34.69	PRINT & REL.,LABOURING & OTH. ELEMENTAL WORK, N.E.C.
34.71	MOTOR VEHICLE FABRICAT. & ASSEMBL. OCCS. N.E.C.
34.79	INSULATING OCCS. CONSTRUCTION
34.83	ELECTRIC,ELECTRONIC & REL. EQUIP.:FABRIC. ASSEMBL I.& R. OCCS.
34.84	METAL PROCESS:LABOURING & OTH. ELEMENTAL WORK
35.08	METAL PROCESS & REL. OCCS. N.E.C.
35.15	WELDING & FLAME CUTTING OCCS.
35.25	WEIGHERS
35.29	PAPER PROD. FABRICAT. & ASSEMBL. OCCS.
35.31	SUGAR PROCESS & REL. OCCS.
35.39	WATER TRANSPORT OPERATIONS OCCS., N.E.C.
35.47	ELECTRICAL EQUIP. FABRICAT. & ASSEMBL. OCCS.
35.51	ROCK & SOIL DRILLING,OTHER OCCS.
35.68	SUPERVISERS:LODGING & OTHER ACCOMODATIONS
35.70	RELIGION,OCCS.,N.E.C.
35.84	STRUCTURAL METAL ERECTORS
35.89	FOREMEN:FARMING,HORTICULTURE & ANIMAL HUSBANDRY
36.25	METAL SHAPING & FORMING OCCS. EXCEPT MACHINING N.E.C.
36.32	ROASTING, COOKING & DRYING OCCS. CHEMICALS & REL. MATERIALS
36.55	NURSING ASSISTANTS
36.69	MIXING & BLENDING OCCS. CHEMICAL & REL. MATERIALS
36.78	PULP & PAPERMAKING:LABOUR & OTH. ELEMENTAL WORK
36.93	PROCESSING:I.T.G. & S. OCCS.,N.E.C.
37.09	PRINTING & REL. OCCS.
37.24	FOOD & BEVERAGE PREPARATION & REL. SERVICE OCCS.:SUPERVISORS
37.61	PLUMBING,PIPEFITTING & REL. OCCCS.
37.65	SHEET METAL WORKERS
37.66	MACHINE TOOL OPERATING OCCS.
37.67	MECHANICS & REPAIRMEN EXCEPT ELECTRICAL N.E.C.
37.75	MINERAL ORE TREAT.:LABOURING & OTH.ELEMENT.WORK

37.83	MOTORMEN & DINKEYMEN,EXCEPT RAIL TRANSP.
37.85	HOISTING OCCS. N.E.C.
37.95	CRUSHING & GRINDING OCCS: MINERAL ORES.
38.06	FOREMEN:FORESTRY & LOGGING OCCS.
38.14	METAL EXTRUDING & DRAWING OCCS.
38.22	DANCERS AND CHOREOGRAPHERS
38.23	NURSING,THERAPY & REL. ASSIST.OCCS. N.E.C.
38.24	PRECISION INSTRUMENTS & REL.EQUIP FABRIC. & ASSEMBL.OCCS,N.E.C.
38.28	SUPERVISERS:OTHER SERVICE OCCS.
38.28	TELEPHONE OPERATORS
38.35	SALES CLERKS,COMMODITIES
38.52	STOCK CLERKS & REL. OCCS.
38.56	REFEREES & REL. OFFICIALS
38.57	ELECTRONIC EQUIP. FABRICAT. & ASSEMBL. OCCS.
38.60	PRODUCT FABRICAT.ASSEMBL.& REPAIR:I.T.C. & S. OCCS.,N.E.C.
38.75	ENGRAVERS,ETCHERS & REL. OCCS.
38.80	BOOKBINDERS AND REL. OCCS.
38.91	FOREMEN:EXCAVATING,GRADING,PAVING & REL. OCCS.N.E.C.
38.98	METAL HEAT TREATING OCCS.
39.01	FOOD,BEVERAGE & REL. PROCESS.:I.T.C. & S. OCCS.
39.02	MANAGERS:HOTEL,MOTEL & OTH. ACCOMODATIONS
39.03	PAINTERS,SCULPTORS & REL. OCCS.
39.03	RAIL TRANSPORT EQUIP. MECHANICS & REPAIRMEN
39.22	LOG INSPECT. GRAD.,SCALING &REL OCCS.
39.41	METAL SMELT.CONVERTING & REFINING FURNACEMEN
39.82	MATERIAL RECORDING,SCHEDULING & DISTRIB. OCCS.N.E.C.
39.84	MOTOR TRANSPORT OPERATING OCCS. N.E.C.
39.85	MACHINING,I.T.C. & S. OCCS., N.E.C.
39.96	CLAY,GLASS & STONE PROCESS & FORMING:I.T.C. & S. OCCS.
40.00	WATCH & CLOCK REPAIRMEN
40.22	FOREMEN:WOOD PROCESS OCCS. EXCEPT PULP & PAPERMAKING
40.25	FOREMEN:WOOD MACHINING OCCS.
40.33	SUPERVISERS:APPAREL & FURNISHING SERVICE OCCS.
40.41	TELLERS & CASHIERS
40.45	ARCHITECTURE & ENGINEERING,OTH.OCCS.,N.E.C.
40.51	PERFORMING & AUDIO-VISUAL ARTS, N.E.C.
40.56	METAL SHAPING & OTHER MACHINING & REL. OCCS. N.E.C
40.62	MINING & QUARRYING INCL. OIL & GAS FIELD OCCS. N.E.C.
40.68	RECEPTIONISTS & INFORMATION CLERKS
40.74	BEVERAGE,PROCESS. OCCS.
40.96	FOREMEN:MOTOR TRANSP.OPERATING OCCS.,
40.97	FABRIC ASSEMBL.& REP.RUBBER,PLAST. & REL.PROD.:I.T.C. & S. OCCS.
41.07	BOILERMAKERS, PLATERS & STRUCTURAL METAL WORKERS
41.08	METAL ROLLING OCCS.
41.08	ROTARY WELLDRILLING & REL. OCCS.
41.16	HOSTESSES & STEWARDS,EXCEPT FOOD & BEVERAGES
41.20	AIR TRANSPORT OPERATING OCCS. N.E.C.
41.37	STATIONARY ENGINE & UTIL. EQUIP.OPERATING & REL.OCCS.,N.E.C.
41.41	PULP & PAPERMAKING & REL. OCCS.,N.E.C.
41.41	SALES OCCS: COMMODITIES N.E.C.
41.47	INDUS.FARM & CONSTRUC.MACHINERY MECHANICS & REPAIRMEN
41.58	PRINTING PRESS OCCS..
41.60	FOREMEN:FABRICAT. ASSEMBL.& REPAIR OCCS:WOOD PRODUCTS
41.71	AIRCRAFT FABRICAT. & ASSEMBL. OCCS. N.E.C.
41.77	MAIL CARRIERS
41.81	ENGINEERING OFFICERS,SHIP
41.92	MACHINIST & MACHINE TOOL SETTING-UP OCCS.
42.03	MELTING & ROASTING OCCS. MINERAL ORES.
42.33	FILTERING, STRAINING & SEPARATING OCCS:CHEM.&REL. MAT.
42.42	FOREMEN:OTHER CONSTRUCTION TRADES OCCS.
42.50	MINERAL ORE TREATING OCCS.N.E.C.
42.74	FOREMEN:FABRICAT. ASSEMBL.& REPAIR OCCS:TEXTILES,FUR & LEATH. PROD.
42.78	RECEPTION,INFORMATION,MAIL & MESSAGE DISTRIB.OCCS.,N.E.C.
43.03	RADIO & T.V. SERVICE REPAIRMEN
43.13	ARMED FORCES,OTHER RANKS
43.22	MOTION PICTURE PROJECTIONISTS

43.31	MUSICIANS
43.79	ELEC. & REL. EQUIP-I.& R.OCCS. N.E.C.
43.79	SALESMEN & SALESPERSONS COMMODITIES,N.E.C.
43.89	FOREMEN:MATERIALS HANDLING & REL.OCCS.N.E.C.
43.89	MIXING,SEPARATING FILTERING & REL. OCCS.MINERAL ORES
44.14	OTHER SALES OCCS.,N.E.C.
44.18	OTH.CRAFTS & EQUIPMENT OPERATING OCCS.N.E.C
44.21	CELLULOSE PULP PREPARING OCCS.
44.30	SUBWAY & STREETRAILWAY OPERATING OCCS.
44.32	OFFICE MACHINE OPERATORS
44.40	RAILWAY TRANSPORT OPERATING SUPPORT OCCS.
44.40	TECHNICIANS: LIBRARY,MUSEUM & ARCHIVAL SCIENCES
44.44	FOREMEN:CLAY,GLASS & STONE & REL. MATERIAL MACHINING OCCS.
44.57	EQUIP. REPAIR EXCEPT ELECTRICAL:I.T.G. & S. OCCS.
44.70	FOREMEN:TEXTILE PROCESS OCCS.
44.72	LIBRARY,MUSEUM & ARCHIVAL SICS., N.E.C.
44.78	MEDICINE & HEALTH,OTH. OCCS.,N.E.C.
44.85	PHOTOGRAPHIC PROCESS OCCS.
44.89	DECK OFFICERS
45.00	FOREMEN:MECHANICS & REPAIRMEN EXCEPT ELECTRICAL
45.00	TYPESETTERS & COMPOSITORS
45.19	METAL MACHINING :I.T.G. & S. OCCS.
45.32	STEREOTYPERS & ELECTROTYPERS.
45.46	TYPISTS & CLERK TYPISTS
45.53	FABRICAT.ASSEMBL.METAL PRODUCTS:I.T.G. & S. OCCS.,N.E.C.
45.57	LIBRARY & FILE-CLERKS
45.63	CHEM.PETROL,RUBB.PLAST.& REL.MATER. PROCESS OCCS. N.E.C.
45.67	POLICEMEN & INVESTIGATOR, PRIVATE
45.94	FINANCE & COMMERC. ART.PHOTOG. & REL. FIELDS N.E.C.
45.97	FOREMEN:FOOD,BEVERAGE & REL.PROCESS. OCCS.
46.22	SUPERVISORS & FOREMEN, N.E.C.
46.32	LOCOMOTIVE ENGINEERS & FIREMEN
46.44	GENERAL OFFICE CLERKS
46.46	METAL SHAPING & FORMING EXCEPT MACHINING:I.T.G. & S. OCCS.
46.56	FOREMEN:OTHER PROCESS OCCS.
46.60	NUNS & BROTHERS (W) N.O.R.
46.65	FOREMEN:OTHER MACHINING & REL. OCCS.N.E.C.
46.86	COACHES,TRAINERS,INSTRUCTORS & MGRS:SPORT & REC.
46.88	CONSTRUCTION ELECTRIC. & REPAIRMEN
46.90	PAPERMAKING & FINISHING OCCS.
47.04	FOREMEN:CLAY,GLASS & STONE PROCESS.FORMING & REL. OCCS.
47.07	I.T.G & S. OCCS.
47.26	PATTERNMAKERS & MOULDMAKERS N.E.C.
47.40	FOREMEN:METAL SHAPING & FORMING OCCS.EXCEPT MACHINING
47.41	SUPERVISORS: OTHER SALES OCCS.
47.66	SUPERVISORS: SALES OCCS.COMMODITIES
47.86	CONDUCTORS & BRAKEMEN, RAILWAY
47.86	MINERAL ORE TREATING:I.T.G. & S. OCCS.
47.97	FOREMEN:PRODUCT FABRICAT. ASSEMBL.& REPAIR OCCS.N.E.C.
48.08	MAIL & POSTAL CLERKS
48.21	EL.POW.LIGHT & WIRE COMMUN. EQUIP.EREC. I.& R.OCCS. N.E.C.
48.28	DENTAL HYGENISTS,ASSIST. & TECHNIC.
48.38	METAL PROCESSING:I.T.G. & S. OCCS.
48.49	WOOD PATTERNMAKING OCCS.
48.51	ELECTRICAL POWER LINEMAN & REL. OCCS.
48.65	AD AND ILLUSTRATING ARTISTS
48.73	OTH. CLERICAL & REL.OCCS. N.E.C.
48.80	FABRIC.ASSEMBL.I.& R.EL.ELECTRON.& REL. EQUIP.:I.T.G. & S. OCCS.
49.02	FOREMEN: FABRICAT.ASSEMBL.REPAIR OCCS:RUBBER,PLAST.& OTH.REL.PROD.
49.05	PHYSICAL SICS., N.E.C.
49.10	CONSTRUC.EXCEPT ELECTRICAL:I.T.G. & S. OCCS.
49.10	POSTMASTERS
49.12	WELFARE & COMMUN. SERVICES
49.29	ATHLETES
49.42	ACTORS
49.52	PHOTOGRAPHERS & CAMERAMEN

49.64	SUPERVISORS: MATERIAL RECORDING, SCHEDULING & DISTRIB. OCCS.
49.68	INSURANCE, BANK & OTH. FINANCE CLERKS
49.79	COLLECTORS
49.79	DISPENSING OPTICIANS
49.89	NURSES-IN-TRAINING
49.89	PHOTOENGRAVERS & REL. OCCS.
49.99	FOREMEN:MINING & QUARRYING INCL. OIL & GASFIELD OCCS.
50.06	REAL ESTATE SALESMEN
50.14	BUS. AND COMMERC. MACHINE MECHANICS AND REPAIRMEN
50.21	BUS. AND COMMERC. MACHINES FABRICAT. & ASSEMBL.OCCS. N.E.C.
50.30	PRINTERS, ENGRAVERS EXCEPT PHOTOENGRAVERS
50.40	FOREMEN:RAILWAY TRANSPORT OPERATING OCCS.
50.42	MINISTERS OF RELIGION
50.44	PRODUCTION CLERKS
50.70	BOOKKEEEPERS & ACCOUNTING CLERKS
50.94	BOOKKEEPING, ACCOUNT-RECORDING & REL. OCCS. N.E.C.
50.94	TELEGRAPH OPERATORS
50.95	FIRE FIGHTING OCCS.
51.31	NURSES, GRAD. EXCEPT SUPERVISORS
51.34	FUNERAL DIRECTORS, EMBALMERS & REL. OCCS.
51.40	FOREMEN:METAL PROCESS. & REL.OCCS.
51.56	AIRCRAFT MECHANICS AND REPAIRMAN
51.58	STATS. CLERKS
52.17	FOREMEN:METAL MACHINING OCCS.
52.23	UNIVERSITY TEACHING & REL. OCCS.
52.35	LIFE SCIENCES OCCS., N.E.C.
52.40	CHEM.PETROL.RUBBER.PLAST.& REL. MATER. PROCESS.:I.T.G. & S. OCCS.
52.40	SALES OCCS: SERVICES, N.E.C.
52.40	TOOL & DIE MAKING OPERATIONS
52.41	FOREMEN:PULP & PAPERMAKING & REL. OCCS.
52.44	SECRETARIES & STENOGRAPHERS
52.64	LAW & JURISPRUDENCE, N.E.C.
52.95	FOREMEN:PRINTING & REL. OCCS.
53.01	PRODUCT & INTERIOR DESIGNERS
53.11	CLAIM ADJUSTERS
53.20	TEACHERS OF EXCEPTIONAL STUDENTS, N.E.C.
53.32	PHYSIOTHERAPISTS, OCCUPATIONAL & OTHER THERAPISTS
53.49	FOREMEN:STATIONARY ENGINE & UTIL. EQUIP. OPERAT. & REL. OCCS.
53.89	FOREMEN:MINERAL ORE TREATING OCCS.
54.01	ELECTRON & REL COMMUN. EQUIP. OPERATING OCCS. N.E.C.
54.03	SOC. WORK & REL. FIELDS N.E.C.
54.14	SURVEYORS
54.25	FOREMEN:FABRICAT. & ASSEMBL. OCCS. METAL PRODUCTS N.E.C.
54.27	INSPECTORS & REGULATORY OFFICERS NON-GOV'T.
54.56	FOREMEN:OTHER TRANSP. & REL. EQUIP. OPERATING OCCS.
54.63	LIBRARY, FILE & CORR.CLERKS & REL. OCCS, N.E.C.
54.81	POWER STATION OPERATORS
55.03	TRAVEL CLERKS, TICKET, STATION & FREIGHT AGENTS
55.35	LIFE SCIENCES TECHNOLOGISTS & TECHNICIANS
55.40	OTHER TEACHING & REL.OCCS., N.E.C.
55.43	BUYERS, WHOLESALE & RETAIL TRADE
55.45	FINE ARTS SCHOOL TEACHERS
55.49	MANAGEMENT OCCS. CONSTRUC. OPERATIONS
55.52	PULP & PAPERMAKING:I.T.G. & S. OCCS.
55.58	ELEMENTARY AND SECONDARY SCHOOL TEACHING & REL. OCCS. N.E.C.
55.85	E.D.P. EQUIP. OPERATORS
55.88	FOREMEN:FABRICAT. ASSEMBL. I.& R. OCCS.EL., ELECTONIC REL. EQUIP.
56.00	FOREMEN: EL.POW.LIGHT & WIRE COMMUN. EQUIP.OP.OCCS., N.E.C.
56.39	INSTRUCTORS & TRAINING OFFICERS N.E.C.
56.51	RADIO & T.V. BROADCASTING EQUIPMENT OPERATORS
56.61	SUPERVISORS: RECEP.INFO.MAIL, MESSAGE DISTRIB. OCCS.
56.80	SUPERVISORS: STENOGRAPHERS & TYPING OCCS.
56.85	MEMBERS OF LEGIS. BODIES
56.86	MEDICAL LAB.TECHNOLOGISTS & TECHNIC,
56.99	PERSONNEL CLERKS
57.00	SUPERVISORS: NURSING OCCS.

57.06	FOREMEN: CHEMS.,PETROL,RUBBER,PLAST.,&REL. MATERIAL PROCESS OCCS.
57.12	HEALTH DIAGNOSING & TREATING OCCS. N.E.C.
57.22	MATH.STATS.SYSTEMS ANAL. & REL. FIELDS, N.E.C.
57.28	ADVERTISING SALESMAN
57.41	COMMERCIAL TRAVELLERS
57.49	DISTIL.,SUBLIM. & CARBONIZ. OCCS. CHEMICALS & REL. MATERIALS
57.71	INSURANCE SALESMEN & AGENTS
57.89	PRECISION INSTRUMENTS MECHANICS & REPAIRMEN
57.96	SOC.SCIENCES. & REL. FIELDS N.E.C.
57.99	SERVICES MANAGEMENT OCCS.
58.40	OTHER MANAGERS,CONSTRUCTION
58.53	RADIO & T.V. ANNOUNCERS
58.72	RADIOLOGICAL TECHNOLOGISTS & TECHNICIANS
58.86	OFFICIALS & ADMINISTRATORS UNIQUE TO GOV'T,N.E.C.
58.86	OTHER MANAGERS,TRADE
58.88	SOUND RECORDING & REPRODUCTION EQUIP. OPERATORS
59.13	FOREMEN:OTHER CRAFTS & EQUIP. OPERATING OCCS. N.E.C.
59.19	AIR TRANSPORT OPERATING SUPPORT OCCS.
59.34	WIRE COMMUN. & REL. EQUIP. I.& R. OCCS.
59.56	EL.POW.LIGHT & WIRE COMMUN.EQUIP.EREC.I.& R.:I,T.C. & S. OCCS.
59.72	INSPECTORS & REGULATORY OFFICERS GOV'T.
59.74	ELECTRONIC & REL EQUIP. INSTALL & REPAIR OCCS. N.E.C.
59.78	SALESMEN & TRADERS,SECURITIES
60.10	POLICEMEN & DETECTIVES, GOVERNMENT
60.43	PHYSICAL SCIENCES TECHNOLOGISTS & TECHNICIANS
60.57	SOCIOLOGISTS,ANTHROPOLOGISTS & REL. SOC. SCIENTISTS
60.70	PURCHASING OFFICERS & BUYERS EXCLUDING WHOLESALE & RETAIL TRADE
60.86	BUSINESS SERVICES SALESMEN
60.95	SOCIAL SCIENCES N.E.C.
60.99	MANAGEMENT OCCS. TRANSPORT & COMMUNICATIONS OPERATIONS
61.19	AGRICULTURISTS & REL. SCIENTISTS
61.35	SUPERVISORS: OTHER CLERICAL & REL. OCCS., N.E.C.
61.48	SUPERVISORS: BOOKKEEPING,ACCT.-RECORDING & REL. OCCS.
61.56	SUPERVISORS: SALES OCCS. SERVICES
61.64	SOCIAL WORKERS
61.69	TRANSLATORS & INTERPRETERS
61.79	FOREMEN: AIR TRANSPORT OP. OCCS.
61.85	PURCHASING MANAGEMENT OCCS.
61.87	LIBRARIANS & ARCHIVISTS
62.09	DRAUGHTSMEN
62.15	SUPERVISORS:LIBRARY MUSEUM & ARCHIV. SCIENCES
62.26	PSYCHOLOGISTS
62.50	ARCHITEC. & ENGINEERING TECHNICIANS
62.72	PROTECTION SERVICE OCCS.,N.E.C
62.81	WRITERS & EDITORS
63.12	MANAGEMENT: PERSONNEL & INDUS. RELATIONS OCCS.
63.99	OTHER MANAGERS & ADMINISTRATORS, N.E.C.
64.14	SUPERVISORS: LIBRARY FILE & CORR. CLERKS & REL. OCCS.
64.39	OTHER MANAGERS:TRANSPORTATION & COMMUNICATION
64.41	DIETICIANS & NUTRITIONISTS
64.49	TECHNICAL SALESMEN & REL. ADVISORS
64.64	OTHER MANAGERS:NON-DURABLE GOODS MANUFACTURE
64.70	MANAGEMENT & ADMINISTRATION,OCCS. REL., N.E.C.
64.80	OTHER MANAGERS:SERVICE
65.10	MANAGEMENT:SALES & ADVETISEMENT OCCS.
65.21	OTHER MANAGERS,OTHER INDUSTRIES
65.58	FOREMEN:ELECTR. & REL COMMUN. EQUIP.OP OCCS. N.E.C.
65.70	PERSONNEL & REL. OFFICERS
65.77	BIOLOGISTS & REL. SCIENTISTS
65.85	TEACHERS:ELEMENTARY AND KINDERGARTEN
66.12	TEACHERS:COMMUN. COLLEGE & VOCATIONAL SCHOOL
66.20	OCCUPATIONS IN WRITING,N.E.C.
66.39	OTHER MANAGERS:DURABLE GOODS MANUFACTURE
66.41	CHEMISTS
66.69	GENERAL MANAGERS & OTHER SENIOR OFFICIALS
66.88	MANAGEMENT:SOC.SCIENCES & REL. OCCS.

66.92	AERONAUTICAL ENGINEERS
66.98	MATHEMATICIANS, STATISTICIANS & ACTUARIES
67.03	PRODUCERS & DIRECTORS,PERFORMING & AUDIO-VISUAL
67.11	INDUSTRIAL ENGINEERS
67.18	SUPERVISORS,OTH.OCCS.IN ARCHITECTURE & ENGINEERING
67.41	ACCOUNTANTS, AUDITORS,FINANCIAL OFFICERS
67.54	MECHANICAL ENGINEERS
67.83	PILOTS, NAVIGATORS & FLIGHT ENGINEERS
68.10	COMMISSIONED OFFICERS,ARMED FORCES
68.22	FINANCIAL MANAGEMENT OCCS.
68.67	GOVERNMENT ADMINISTRATORS
68.67	OTHER MANAGERS:MINES & OIL WELLS
68.67	SUPERVISORS: OFFICE MACHINE & E.D.P. EQUIPMENT OPERATORS
68.71	MINING ENGINEERS
68.72	SYSTEMS ANALYSTS & COMPUTER PROGRAMMERS & REL. OCCS.
68.79	PHYSICISTS
68.95	ARCHITECTS AND ENGINEERS N.E.C.
69.21	GEOLOGISTS
69.25	CIVIL ENGINEERS
69.25	TEACHERS:POST-SECONDARY SCHOOL,N.E.C.
69.63	ECONOMISTS
69.70	PETROLEUM ENGINEERS
70.43	MEDICINE AND HEALTH ADMINISTRATORS
70.74	ELECTRICAL ENGINEERS
70.89	CHEMICAL ENGINEERS
71.26	OSTEOPATHS & CHIROPRACTORS
71.63	METALLURGICAL ENGINEERS
71.77	TEACHERS:SECONDARY SCHOOL
71.92	EDUCATIONAL & VOCATIONAL COUNSELLORS
71.95	ARCHITECTS
72.06	JUDGES & MAGISTRATES
72.17	PHARMACISTS
72.29	TEACHERS:UNIVERSITY
72.73	LAWYERS & NOTARIES
72.80	METEOROLOGISTS
73.48	VETERINARIANS
74.22	PHYSICIANS & SURGEONS
74.28	OPTOMETRISTS
74.43	MANAGERS,SCI. & ENGINEERING
74.69	DENTISTS
74.71	NUCLEAR ENGINEERS
75.28	TEACHING AND REL. FIELDS ADMINISTRATORS