REMEDIATION OF READING DISABILITY IN CHILDREN

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DEDICATED TO

Anna

I miss you

so much, I wish you were

here to share my happiness

CERTIFICATE

This is to certify that this Dissertation entitled: REMEDIATION OF READING DISABILITY IN CHILDREN is the bonafide work in part fulfilment for the Final year MSc, (Speech and Hearing) of the student with Reg.No.M9321.

Mysore
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C E R T I F I C A T E

This is to certify that this Dissertation entitled : REMEDIATION OF READING DISABILITY IN CHILDREN has been prepared under my supervision and guidance.

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DECLARATION

I hereby declare that this Dissertation entitled: REMEDIATION OF READING DISABILITY IN CHILDREN is the result of my own study under the guidance of Dr.Pratibha Karanth, Prof, and Head of the Department of Speech Pathology, All India Institute of Speech and Hearing, Mysore and has not been submitted earlier at any University for any other Diploma or Degree.

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INTRODUCTION

"Several of my uncles and aunts had tried to teach me to read and because they could not, and because I was much older than children who read easily, had come to think, as I have learnt since, that I had not all my faculties' (Yeats, 1965).

In his autobiography Yeats one of the greatest poets in the English language, speaks frequently of the personal frustrations he experienced during his early school years. It is generally known from his letters and his prose that Yeat's spelling and punctuation skills were weak, his handwriting was often difficult to decipher, and he was not a strong academic student in most subjects during his school years. Yet he became one of the major poets of the 20th century, winning the Nobel prize for literature in 1923.

This statement puts forward the question as to whether Yeats had some form of Dyslexia. The purpose for drawing attention to this disability in one of the great literacy giants is to offer encouragement to those who presently endure the frustrations of the disability and to illustrate through the achievements of an individual like the poet that

it is possible for those with dyslexia to go far beyond basic literacy.

Dyslexia is a learning disability involving difficulty with reading inspite of normal intelligence, adequate educational opportunity and no evidence of sensory, neurological or emotional dysfunction. This language disorder is characterized by difficulty with reading, spelling, handwriting, language and memory (Siegal, 1985;

Life in a complex and fast paced society such as ours is often hectic and exasperating. Life within the classroom reflects the same complexity and demands much of both the teacher and pupils. Classes are large, children are varied in interest, needs and abilities. And teachers are pressed to seek better ways to guide children in the learning process. These demands have led many educators to advocate increased individualisation of instruction.

The subject of developmental dyslexia should intrigue any thoughtful person who wonders why is that Man alone among the animal species is endowed with the mysterious gift of language and that in favourable circumstances he can

cystallize his verbal thinking beyond audible speech so that others are included in his network of communication. The tortuous invention of writing which evolved tens of thousands years after the beginning of speech in primitive man was epochal because it allowed ideas to be codified. Reading or the ability to interpret those inscriptions was also a relative late comer in human accomplishment.

Latest of all has arisen our awareness that some children who are exposed to formal tuition have peculiar difficulties in acquiring the art of learning to read and write accurately and fluently.

Children who suffer from developmental dyslexia respond to remedial teaching of the right kind. Worried parents and teachers are now aware of the potentially favourable prognosis so long as the child is given appropriate help. Greater recognition of the fact that such a child has difficulties beyond those of being a retarded reader and poor speller will avoid some of the hardships which many dyslexics still experience during their school days.

The problem of dyslexia and related learning disabilities have become matters of increasing public

attention. A child's or adult's inability to read with understanding is a major obstacle to school learning and may have far reaching social and economic implications. The normal and appropriate concern of parents for the welfare of their children and of society for its disadvantaged has fostered a proliferation of purportedly diagnostic and remedial procedures many of which are controversial.

Developmental dyslexia often may require a multidisciplinary approach from medicine, education and psychology in evaluation, diagnosis and treatment. The remediation of dyslexic children and adults is a problem for educational science. Proper proven, expert educational and psychological testing should be performed to identify the type of learning disability. Since remediation may be more effective during the early years especially prior to the development of a pattern of failure, early diagnosis is paramount. Since deficient ability to learn to read canbe the result of a variety of factors including different neurophysiologic deficiencies, cognitive deficits or psychological factors no single educational approach is applicable to all children. Obviously one particular method of specialist teaching will not suit evey single dyslexic child, so teachers and therapists need to have a number of

techniques at their fingertips to be able to meet every failing readers needs.

Dyslexia was originally considered to be a manifestation of aphasia. Historically, the first reading disorders to have been investigated were acquired as the result of brain injury. However, the distinction between acquired disorders and congenital or developmental dyslexia has been clarified. Much in our medical and psycholinguistic history substantiates the proposition that developmental dyslexia is a specific developmental language disorder involving some phonological processing deficits.

There is neuroanatomical evidence of structural or morphologic differences in the brains of individuals with developmental dyslexia. these differences may be under genetic influence.6

Reviews of the treatment literature on developmental dyslexia conclude that there are few published reports providing any convincing evidence of significant treatment effects obtained with this population of children. The following authors appear in complete consensus that there exists no evidence from properly controlled studies of the relative merit of one treatment approach over another

(Gittelman, 1983). Whether the disorder is amenable to treatment and what constitutes effective treatment are questions which remain essentially unanswered. These issues are of considerable practical significance given recent reports on the adult outcomes of children with learning disability and the realization that these developmental learning disorders are typically a life long complaint with a range of potential but apparently not inevitable sequelae in adult life.

Because competancy in reading builds on and interacts with existing proficiencies in spoken language remedial assistance for individuals with dyslexia should deal with the entire system and be devoted to all aspects of language. Remediation has been most successful when all avenues of approach are fully utilized as inthe combined multisensory approaches which addresses speaking as well as reading and writing. It is incumbent on the educational system to recognize dyslexia and to provide the appropriate alternative instructional approaches to beginning reading for children with developmental dyslexia.

The present study was undertaken to evaluate the efficacy of a remedial program in English based on the Aston Teaching Programme in a small group of dyslexic children. A

few modifications were incorporated such that the remedial programme encompassed the areas of -

(1) auditory visual channel deficits

(2) specific spelling cues and rules

(3) visuomotor perceptual aspects

(4) reading, oral and written expression of language.

REVIEW OF LITERATURE

Reading is man's most potent skill. Without reading his world is circumscribed by his neighbours. All he learns is what he picks up in conversation, information garbled in its transmission delayed by the slow seepage of news through word of mouth.

Charters, W.W. (1941)

The world wide population explosion and the rapidly accelerating technological advances of the last quarter of a century have caused an upheaval in our socioeconomic concepts. There are more and more people to be educated; there are fewer and fewer jobs for the poorly educated. Only those who have an education can hope to survive in our changing world. Those who do not take advantage of the educational opportunities offered to them, or those who are not able to, will be left out of the main stream of human progress. There lies always the underlying assumption that every one who has attended school can read and this is taken for granted.

Education depends primarily on communication through spoken or written words. Early in history, education depended largely on verbal communication but since the

invention of the printing press the written word has become a requisite to practically all phases of education. Also reading the printed or written word enables us to enjoy many of the good things of life to communication with each other and to share the experiences of others through recorded history, scientific records, stories, plays and poetry. Written words may be a source of joy and inspiration just as a painted picture or the score of a symphony may be.

The process involves the capacity to perceive, to recognize symbols and to integrate them into meaningful sequence. It also involves some capacity for abstract reasoning. Any person who has some dysfunction or developmental lag in reading, emotional block in learning or is just a slow reader is handicapped regardless of his endowment of general intelligence or hiB abilities in other fields. Reading is so fundamental that it cannot be by passed without tremendous loss.

With great concentration on the study of language disorders by many outstanding scientists during the last half of the 19th century, it seems incredible that no one advanced the idea that some people with language disturbances might just "grow up that way" without organic

insult to the brain or without emotional bases for the disability.

Certainly, handicaps such as color blindness, tone-deafness and even general awkwardness had been known to occur without brain damage or psychogenetic etiology. Also, very special abilities in mathematics, music, memory, fluency of speech, poetry and writing had long been recognized as special "gifts", which were not attributed to any anomaly of the brain. Often these gifts become manifest without any associated emotional problems, and sometimes in spite of emotional difficulties or because of them.

If special gifts could be the result of nature's largess, why did no investigator at least postulate the theory that special disabilities might be the result of nature's lack of bounty? It was not until around the year 1896 - and from several quarters almost simultaneously that investigators began to call attention to the fact that some people do "just grow up" with certain deficiencies or disabilities in language functions, particularly reading.

Serious study of alexia or dyslexia dates from around 1872 when Sir William Broadbest described patients who were unable to read, but who also demonstrated "some verbal

aphasia or amnesia in a greater or lesser degree". However when Kussmaul (1877) pointed out that blindness for words can be found clinically as an isolated condition, he stated that the word blindness represents the "pathological condition of a special faculty" and that "a complete text blindess may exist although the power of sight, the intellect, and the powers of speech are intact". The term dyslexia was introduced in 1887 by German Opthalmologist, Berlin to describe a group of patients who had great difficulty in reading due to cerebral disease, thus dyslexia was originally used by Berlin to describe an acquired condition and he saw dyslexia as a member of the general family of the aphasias.

Morgan (1896) an English Ophthalmologist is credited with being the first to give a definitive description of specific reading disability. Hidden in a few paragraphs in the British Medical Journal, Morgan's ability remains as a classic and precise delineation of reading disability accompanied by spelling errors. Morgan called this kind of disturbance "congenital word blindness" and said it was evidently congenital and due most probably to defective development of that region of the brain - the left angular gyrus region.

Hinshelwood (1895) an Ophthalmologist of Glasgow made a great contribution to the study of reading disbility. He studied the condition over a long period of time and published a series of articles of great benefit to subsequent investigators. He remained the torchlighter of reading disability for over two decades.

Hinshelwood (1971) was the first physician to advocate a specific instructional approach for written language disorders in children. He stated, it is thus in their feature to acquire the art of reading by sight alone and without appeal to any other cerebral centres than the visual that this defect becomes conspicuously manifest. He advocated one-on-one teaching, utilizing what he called the alphabetic method in a multisensory approach. "The method of simultaneous appeal to as many cerebral centres as possible". He focussed on the concept that the difficulties were caused by a grave defect in the visual memory store. Significantly, this observation contained the germ of the later psychological concept that the problem could be related to a deficit in the STM store.

Turning back to the time just after 1896 we find that other English Ophthalmologists published similar

observations (Nettleship, 1901; Sydney Stephenson, 1904; Thomas, 1905 and Fisher, 1905).

It is evident that English investigators were the first to recognize the problem of specific reading disability although they called it congenital word blindness. Clairborne (1906) an Opthalmologist in New York city might properly be called the pioneer in this field in the U.S.

In 1925, an article appeared in the Archieves of neurology and Psychiatry, Word blindness" in School children by neuropathologist Orton. He showed agreement with Hinshelwood in his report, in that the preliminary study of individuals with dyslexia led him to believe that the reading disability forms a graded series of severity, that it is not generically related to general mental retardation, that it is explainable as a variant in the establishment of the physiologic lead in the hemispheres rather than as a pathological condition and as a corollary of the latter view, that proper methods of retraining, if started early enough may be expected to overcome the difficulty.

Orton viewed (1) language as an evolutionary function of the human brain (Orton, 1937), (2) he believed that brain

functions were related to brain structures, (3) he attributed great significance to the finding that are cerebral hemisphere becomes dominated over the other for language function, (4) he attributed an equally great significance to the finding that although the 2 hemispheres of the brain operate together at the first and second levels of cortical elabortion, at third or associative levels there are important differences between them (0rton. 1928c), (5) he believed that the knowledge gained from cases of acquired alexia gave evidence that visual auditory associations at the 3rd cortical level is essential for reading, (6) Orton's study of cases of speech and language disabilities in which thee was evidence of a genetic link led him to conclude that manifest themselves in reading disorders and other language disbilities (Orton, 1930, 1937). Orton (1937) preferred to use the term developmental rather than congenital because he thought the former could include both the hereditary tendency and environmental. Orton's theory was based upon the assumption that the dyslexic perceived images in an inverted, reversed or twisted way caused by conflicting stores of visual inforamtion in left and right cerebral hemispheres. He used the word strephsymbolia to describe this condition. Further he postulated a range of developmental disorders which still hold good today. Orton

considered that reading disability manifests itself in the form of letter and word confusions and reversals, severe reading and spelling difficulties as well as difficulties with the mechanical processes of writing. Interestingly, Orton's descriptions were for sighted because current research approaches have in part supported the assumptions made them.

Like his predecessor Hinshelwood, Orton (1937) recognized that the treatment for dyslexia must be educational. He pointed out "the one factor which is common to the entire group (of language disorders) and that is a difficulty in repicturing or rebuilding in the order of presentation sequences of letters of sounds, or units of movement".

Geschwind (1982) recognized Orton's ability to select the major clinical features of dyslexia and also to set a biological frame work in which dyslexia could be studied. In his original observation Orton pointed out that the frequency of delay in the acquisition of speech in dyslexic children, thus laying the ground work for the important concept that dyslexia appears on a foundation of delay in the development of the entire system devoted to language.

The 1930s and 1940s saw the inquiry move away from the neurologic perspectives into those of the educational and sociological areas. Backwardness in reading became envisaged more as a problem of sociology than a medical issue.

During the late 1940s and 1950s the Word Blind Institute in Copenhagen was one of the first to begin to examine the nature of Dyslexia with positive teaching. The Edith Nome letter case was formulated in those times.

From the 1960s onwards psychologists and neurologists started taking an interest in the concept of dyslexia. For example, neuropsychologists questioned whether cross modal integration of information and information transfer from one cerebral hemisphere to the other nor the corpus callosum might have been the main problem. This was limited to concepts of cerebral hemisphere and laterality (Newton, 1970). In 1963 the Word Blind Centre was set-up in London by the Invalid Children's Association (ICCAA) and was both an important centre of research as well as teaching (Naidoo, 1972).

On a parallel course psycholinguists were looking at the possibility of a language deficit at the phonological level and linguistic coding deficits have been posited as a possible cause of dyslexia. Simply speaking the dyslexic is seen as having inordinate difficulty written word.

How dyslexia is defined has both theoretical and ecucational implications. The validity of research on dyslexia and reading disabilities in general, depends in large part on the criteria used to identify subjects for study. The principal educational implications of defining dyslexia revolve around service delivery issues such as which children are eligible for remedial services.

The fundamental assumption underlying much of the theoretical and remedial work on individuals with dyslexia is that their reading difficulties stem from problems different from those that characterize the "garden variety" poor readers (Gough and Tunmer, 1986). If no differences are found between individuals with dyslexia and garden variety poor readers, one must question whether it is worth it to study dyslexia (Ellis, 1985).

The way children with dyslexia have traditionally been identified is through the use of exclusionary criteria.

The definitions proposed by the World Federation of Neurology (1968) and Perfetti (1985) are typical of exclusionary definitions. Specific Developmental Dyslexia is a disorder manifested by difficulty in learning to read, despite conventional instruction, adequate intelligence and socio cultural opportunity. it is dependent upon fundamental cognitive disabilities which are frequently of constitutinal origin.

A dyslexic is a child who is normal or above atleast in nonverbal IQ, two years behind in reading achievement, and a reading disability that is not explainable primarily by social, economic motivation or emotional factors.

A further definition is given in Critchley and Critchley (1978) Developmental Dyslexia is a learning disbility which initially shows itself by difficulty in learning to read, and later by erratic spelling and lack of facility in manipulating written as opposed to spoken words. The condition is cognitive in essence, and usually genetically determined. It is not due to intellectual inadequacy or to lack of socio cultural opportunity, or to emotional factors, or to any known structural brain defect. It probably represents a specific maturational defect, which

tends to lessen as the child gets older, and is capable of considerble improvement, especially when appropriate remedial help is afforded at the earliest opportunity.

Wheeler and Wheeler (1979) defined dyslexia is follows: Dyslexia is experienced by children of adequate intelligence, as a general language deficit which is a specific manifestation of a wider limitation in processing all forms of information in short-term memory, be they visually or auditorally presented. This wide limitation exhibits itself in tasks requiring the heaviest use and access to short-term memory such as reading but particularly spelling.

A large body of research conducted in the last 10-15 years has converged in finding that individuals with dyslexia often have difficulty performing tasks that require the processing of phonological information. This research has shown that the ability to access the lexicon accurately and rapidly is strongly related with reading skill, but negatively associated with reading disability. Specific deficits have been found in (a) the encoding of speech-sound information in long term memory (b) the use of phonological codes in working memory (c) the retrieval of phonological information from long term memory (d) the production of

complex phonological sequences and (e) the awareness of phonological structures.

Thomson (1984, 1990) - Developmental Dyslexia is a severe difficulty with the written form of language independent of intellectual, cultural and emotional causation. It is characterized by the individual's reading, writing and spelling attainments being well below the level expected based on intelligence and chronological age. The difficulty is a cognitive one affecting those language skills associated with the written form, particularly usual to verbal coding, short term memory and sequencing.

Another important finding from recent studies involves the changes that occur in the manifestation of dyslexia through development. During the preschool years, the impairment often causes some delays in acquiring spoken language. Preschool children who are later identified as dyslexic also have been shown to demonstrate word finding and word naming problems, poor verbal short-term memory and limited phonological awareness skills.

Catts (1989 b) stated that during the school years children with dyslexia experience significant difficulty

acquiring word recognition and spelling skill. These children also demonstrate significant phonological processing difficulties. In most cases, children with dyslexia will also exhibit spoken language deficiencies, particularly in comprehending complex sentences and relating events and stories (Mann, Shankweiler and Smith, 1984; Roth and Spekman, 1986). As they grow older phonemic segmentation skills may be adequate but rapid naming and speech production difficulties will still be found.

Kamhi (1992) modified Catts's (1989 a) definition: Dyslexia is a developmental language disorder whose defining characteristic is a life long difficulty processing phonological information. This difficulty involves encoding, retrieving and using phonological codes in memory as well as deficits in phonological awareness and speech production. This disorder, which is often genetically transmitted is generally present at birth and persists throughout the life span. A prominent characteristic of the disorder is spoken and written language deficiencies.

Features of Dyslexia:

Dyslexic children are characterised simply by making so many mistakes for so long. A child does not just "grow out"

of dyslexia - the problem can be ameliorated by a structured educational process. The point must be made at this juncture that it is likely that during childhood development many children will pass through what appears to the laypersons to be a "classic dyslexic phase" ie. as the children progressively mature from birth towards the first days at school they will at times present most of the symptoms that are dealt with. This is completely natural and is nothing less than an outward indication of cerebral maturation and cognitive development. It is at this early stage that perplexed parents may well be concerned that their child is dyslexic when infact the child is only exhibiting the normal process of growing up. Taken out of an educational setting dyslexics will function quite adequately. Indeed they may well excel at certain specific tasks.

Looking at more formal descriptions of signs and symptoms.

Newton (1970) describes the following behavioural features.

1. Persistent reversal and disordering of letters (e, g, b and d) syllables, words (saw/was) and word order when reading writing and occasionally speaking.

2. Mirror imaging of letters and words.
3. Inability to perceive code and subsequently retain a consistent meaningful symbolic image.
4. The consequent inability to retrieve and express a relevant meaningful output of linguistic material.
5. Severe spelling disorder.
6. Non resolution of hand, eye and ear dominance
7. Late development of spoken language in early childhood.
8. Difficulties with sequencing, order and direction
9. Sometimes motor clumsiness, sometimes hyperactivity and occasionally superior ability in spatial skills in direct contrast with the disbility in linguistic skills.

Miles (1974) regards the following as signs of dyslexia:

1. Discrepancy between intellectual level and performance in spelling.
2. Bizzare spelling.
3. Confusion of b and d in either reading or writing or both.
4. Difficulty in distinguishing between left and right.
5. Difficulty in repeating polysyllable words, such as preliminary, philosophical or statistical.
6. Difficulty in repeating digits in reverse order (and other defects of short-term memory).
7. Inability to do substractions except with concrete aids.

8. Difficulty in memorizing tables.
9. Losing place when reciting tables.
10. A history of clumsiness, late walking or late talking.

Vellutins (1979) describes the following correlated characteristics.

1. Boys are observed to have reading problems more frequently than girls, the ratio generally exceeding 4:1.
2. The incidence of reading difficulties in the families of dyslexics have been found to be specifically significant.
3. Dyslexics have been observed to have difficulty in other forms of representational learning such as telling the time, naming the months and seasons of the year, or days of the week and distinguishing left from right or up from down.
4. The appearance of neurological soft signs (abnormal reflexes minor coordination problems, deviant EEG patterns and so on) has been reported in both clinical and laboratory studies of dyslexia, reinforcing the suggestion that reading problems in some children may be associated with a neurological disorders.
5. There is some evidence that dyslexia significantly correlates with a history of developmental problems particularly in one or more aspects of language.

Thomson (1990) - the following features:

1. A puzzling gap between written language skills and intelligence, the child is advert in the use of verbal language but the deficit is highlighted while communicating with the written word.
2. Delayed and poor reading and spelling persistent reversals, disordering of letters, syllables, words.
3. Bizzare spellings - usual perceptual difficulties, auditory discrimination problems, phoneme segmentation difficulties.
4. Left right confusion and directional difficulties
5. Sequencing difficulties
6. Poor short-term memory skills.

Causes of Dyslexia: Research into the causes of dyslexia falls in two main categories.

1. The neurological ie. pertaining to brain function
2. The cognitive ie. pertaining to perception, memory or similar functions.

In relation to the neurological perspective there are strong suggestions of links between cerebral hemisphere function and dyslexia. Studies using dichotic listening and divided visual field techniques suggest that there is some kind of

association between dyslexia and abnormal neurological functioning. Dyslexic difficulties may be due to either a left hemisphere deficit or possibly some kind of a disconnection syndrome between normal processing for auditory material with abnormal processing for visual material. Another factor which cannot be ruled out is a lag in the maturation of left hemisphere function for language. Certain authors hypothesized that dyslexics who are typically deficient in linguistic processes might not evidence this normal pattern of asymmetry between the hemispheres.

ElectrophyBiological (EEG) studies of Dyslexic brains have demonstrated differences between non-disabled and dyslexic children. There is also evidence that potentially significant differences exist among subtypes of developmental dyslexia. Investigator evaluated evoked response potentials in Boder's (1982) subtypes of developmental dyslexics. It was found that dyslexics diagnosed semantic linguistic deficiencies (dysphonetic dyslexics) had significantly deviant left parietal waveforms compared to their right hemisphere waveforms. He interpreted this finding to suggest Borne electrophysiological pathology in the left language dominant

cerebral hemisphere and right hemisphere pathology for dysdectic dyslexics. Certain investigators studied developmental dyslexics and concluded that there are electrophysiological differences in brain electrical activity in the supplementary motor area (SMA) bilateral medial frontal cortex, Broca's area, an area comparable to Wernicke's area in the left temporal region, the parietal cortex and the primary visual auditory association cortices. The deviant EEG recordings reveal that dyslexics have longer waveform latencies, peak to peak latencies and unusual asymmetries all suggestive of pathology not delayed neurocognitive development.

In the cognitive perspective, early notions of some kind of visual perceptual difficulties are open to serious criticism as are some of the notions of visuomotor performance difficulties and intersensory integration problems at least in the form described in earlier research. However, it would appear that some dyslexic children might have primary difficulties in these visuomotor areas.

Reviews of eye movement research indicate that eye movement and eye sequencing are secondary to the primary problem in decoding the visual symbols into sound ie. the reading process itself.

In relation to memory, there is good evidence for some weakness. A memory capacity difficulty seems possible in dyslexics but there are more likely to be difficulties in the short-term strategies used. Research on memory and dyslexica (Thomson, 1984, 1990; Snowling, 1987) indicates that in the case of long-term memory and in the brief sensory store there does not seem to be a major problem among dyslexic children. It is in the short-term memory areas that there is evidence of weakness. Dyslexics have difficulty in remembering letter patterns and the basic sound symbol correspondences and blending then together to form words in spelling or in basic letter patterns. This STM difficulty fades into another area of weakness that of being aware of the sound structure of written language particularly in phonological coding. There is a point where perception coding and memory overlap with each other, it is suggested that many of the difficulties in aspects of sequencing and memory relate to verbal encoding end processing. Dyslexic children appear to have problem and difficulties in aspects of segmentation, translation of visual symbols into sound codes and possibly in 1990 translating visual symbols into some kind of articulatory code. Here it is suggested by some authors that there is an overlap between dyslexia and aspects of speech disorders.

Certainly there is very strong evidence for some kind of phonological/phonemic verbal coding difficulty in dyslexic children.

Familial and Genetic factors - It has long been recognized that dyslexia tends to run in families and that males are more often affected than females. DeFries and Decker (1985) found that the risk to a son of having an affected father is 40% and of having an affected mother is 35%.

There are data to support genetic heterogeneity in the transmission of dyslexia (Pennington, 1985) linkage studies that have been conducted for about 10 years also report significant linkage between dyslexia and chromosome 15 heteromorphisms in a minority of families with apparent autosomal dominant transmission (Smith, Kemberling, Pennington and Lubs, 1983). Pennington (1989) is currently testing for a possible second loans on chromosome 6. Of particular interest in these genetic analyses of behaviour is evidence that "the underlying neuropsychological deficit Bin dyslexia appears to be a problem in phonemic segmentation .or phonemic awareness skills which causes the primary symptom dyslexia, a deficit in the phonological coding of writing language" (Pennington, 1989).

Psycholinguistic models of Dyslexia:

Several psycholinguistic models of dyslexia have emerged that represent an information processing approach. The sub-components of word recognition and production skills proposed by such information processing frameworks are valuable for analysis of the state of language skills at any particular point in development (Richardson, 1989).

Ellis and Miles (1977) interpreted the information processing ability of children with dyslexia as a lexical encoding deficiency across input and output modalities. They state that the largest and most consistent impairment can be seen in the lexial encoding of the visual events, They also indicated that the basic problem could be the slow rate of access to phonological information stored in long term memory.

It has been suggested that signs of the varieties of acquired dyslexia can be identified in children with developmental dyslexia, and that the information processing model is sufficient to explain the underlying defects. On the other hand it maybe necessary to consider a developmental framework in relation to developmental disorders.

Developmental model

Frith (1986) suggested a developmental framework for the normal development of literacy. This framework comprises three phases, corresponding to the acquisition of logographic, alphabetic and orthographic skills. The acquisition of literacy is gradual, with each new strategy building on top of an already existing one.

Frith (1986) defined logographic as meaning instant word recognition on the basis of salient graphic fature3. By alphabetic she means letter sound by letter sound analysis a strictly sequential putting together of sounds to create a word. By orthographic she means instant recognition of morphemic parts of words, taking into account letter order but not letter sound, if sound is taken into account, it is only that of morphemes or of whole words.

"At each phase a new skill i3 introduced with either reading (input process) or writing (output process) acting as pacemaker. This stepwise progress is driven by a certain opposition between reading and writing processes. At any one of the critical points where a new step has to be taken, breakdown can occur. This will result in different

types of literacy disorder. However, the disorder will not only be characterised by the deficiency in a particular skill, but also by compensatory skills which will orientably develop" (Frith, 1986).

Subtypes of Dyslexia:

The division of dyslexia into subtypes has implications with respect to etiology and remediation. One of the earliest and perhaps most influential attempts to describe subtypes was that by Myklebust and Johnson (1962, 1967). They argued that there are two broad subtypes.

1. Auditory dvslexics - difficulties in aspects of discrimination of speech sounds, in sound blending and naming. Difficulties in auditory sequencing, serial memory. They have a difficulty in analyzing sounds or syllables and synthesizing these to form whole words.

2. Visual Dvslexics - have deficiencies in visual perception and visual discrimination. They argue that these children can learn through auditory modality given appropriate remediation. They have problems indiscrimination of size and form and in scanning from left to right and in recognizing letter clusters. The problem

lies in visualisation for coding purposes, a child can differentiate between visual shapes but cannot symbolize these into either sounds or meaningful units.

One influential and often quoted description is that by Boder (1970, 1971a, and b; 1973). This was based on analysing reading and spelling errors in the dyslexic children's performance and produced a classification into auditory, visual and mixed groups. The auditory difficulties she describes as dysphonetic (63%) - the problem here is in letter sound integration and in learning phonetically. Their spelling errors - alnost for almost, awlake for awake, werber for rember. The visual group she terms as dysdectic (9%) - here the difficulty lies in perceiving words as gestalt. Chidlren can read and spell phonetically but have difficulty in building up sight words and in perceiving whole words. Spelling errors include tok for talk, uther for other etc. The third group includes children who have mixed difficulties in auditory and visual kind.

From his research Bakker (1979, 1981) proposed atleast two subtypes of dyslexia existed. His "Balance Model" accounted for what he termed the P-type dyslexic

characterised by an over reliance of right hemisphere process involving perceptual synthesis which leads to slow reading marked by many fragmentation errors. The L-type dyslexic was charactrised by an over reliance on left hemispheric processes, this group read quickly and made many omission errors, Dichotic listening and electrophysiological studies conducted by Bakker and his colleagues validated the hemisphere specific nature of these subtypes consistent with the Balance Model.

The Status of Metalinguistic Skills in Reading Development:

Theories of reading development stand in Stark contrast to most models of spoken language acquisition in which an explicit understanding of the rules and principles of grammar plays decidedly minor role. Chomsky, 1988; Pinker 1984; Diane Sawyer (1992) laid out an account of reading development which falls squarely within the metalinguistic tradition of reading development. She emphasizes on the role of explicit skills in speech segmentation which she views as a necessary precursor to the metalinguistic understanding of print sound relations. She sketches an account of the causes of developmental difficulty in reading that center on those speech processing capacities. The strong metalinguistic hypothesis of reading development

assests that the processes of mature reading develop directly out of the metalinguistic strategies that children adopt in the early phases of reading development.

Nowhere, among the various components of reading is the metalinguistic approach more firmly grounded than in the way that children learn to identify words by exploiting the phonological level of representation captured in alphabetic orthographies (Hodgeson, 1992). What is open to debate, however, is how those metaphonological skills relate to the development of mature reading processes. Are they the foundation out of which mature reading processes arise? Or do they represent a transient stage of reading development that is only indirectly related to the emergence of of the mature information processing systems that support fluent reading?

Sawyer (1992) presses a simple but vital point about the development of reading related metaphonological skills that is sometimes taken for granted in treatments of reading development. That point is this: Mastering spelling sound relations presupposes an ability to consciously segment spoken language into phonemic constituents. Evidence to that effect can be found in several studies showing that

people who have not had direct experience with alphabetic orthography are unable to carryout the kinds of conscious phonemic segmentation tasks that are often cited as reliable predictors of future reading achievement in preliterate children (Alegina, et al.1986; Ding et al. (1986). Thus, we must conclude that the ability to hear spoken language as a sequence of phonemes is, at least in part, a by product of experience with an alphabetic orthography (Hodgeson, 1992).

Sawyer assets that mastery of spelling sound relations is dependent on a prior mastery of the segmentation of speech into phoneme sized units. Furthermore she suggests that disorders of reading development frequently arise at the level of phonemic segmentation. Sawyer also believes that the source of "true" developmental phonological dyslexia lies in difficulty in extracting phonemic elements from the speech stream.

Readers who are unsuccessful in mastering these metaphonological facts will be limited to reading via primitive logographic representations (Frith, 1985). This strong metalinguistic hypothesis makes rather clear and striking empirical prediction. In particular, it assets that the development of effective metalinguistic phonological knowledge is a necessary precursor to the

development of basic reading skills without that conscious awareness of print sound relations, even minimal success in reading development should not be possible.

REMEDIAL APPROACHES

Rudolph Flesch (1955) in his popular book "Why Johnny can't Read made several starting statements by asking these rhetorical questions: "Do you know that there are no remedial reading cases the Germany, in France, in Italy, in Norway, in Spain - practically anywhere in the World except in the United States?" "Do you know that the teaching of reading was never a problem anywhere in the world until the United States switched to the present method around 1975?"

Most people tend to accept Flesch's statements as valid and place the blame for reading retardation on teaching methods. It is understable that Flesch's view has a direct appeal to parents with children who have difficulty in reading, it is easy to make the teachers the culprits. It is easier to project the fault onto someone else or something outside the family than to look for the causes in the home or in the child.

Unquestionably, a teaching method may make the existing disability more or less evident and secondarily increase or decrease it depending on the method used.

Among the proponents who champion teaching methods as the cause of reading disability there is considerable disagreement. The debate usually centres around the phonic versus the look-say approach in the teaching of reading. The shift took place from the old fashioned, alphabet, phonic, word make up method to the whole word or look and say method and now to a middle ground method.

Sawyer (1992) classifies the methods of teaching reading essentially fall into four groups (1) the visual approaches such as the alphabet method and the word method (2) the auditory appraoches - as in the phonic method (3) kinaesthetic - tactile approaches and (4) combined approaches. Remedial reading methods have grown out of these approaches, are used by specially trained personnel for individuals with severe rading disorders or dyslexia and generally feature multisensory or combined approaches (Richardson, 1991a).

Visual Approaches: The earliest form of written communication was pictographic - a visual esentially "look-

say" approach. It was not until the Phoenicians created the alphabet in the 13th century B.C. that the beginning reader could use an auditory approach.

The first books published for teaching reading followed the alphabet method. In America, one of the earliest reading books was the New England Primer, printed privately in the 1680s and based on the principle that learning the alphabet was the basis of reading instruction.

The word method consists of learring whole words visually by configuration, as the basis of learning to read, rather than isolated letters or letter combinations.

According to some historians Horace Mann started the shift away from the phonic approach. In his report to the Board of Education in Massachusetts in 1838 he said that "presenting the child with the alphabet is giving them what they never saw, heard or thought before ... But the printed names of known things are the signs of sounds which their ears have been accustomed to hear and thier organs of speech utter. It can hardly be doubted therefore that a child would learn to name 26 familiar words sooner than the unknown, unheard and unthought of letters of the alphabet".

Flesch (1955) attributes the, shift to a teacher named who suddenly changed over to the whole word method in 1846. Others have claimed that the change came after the introduction of Gestalt Psychology about 1912. Around the turn of the century some psychologists were advocating the whole word or look say system of teaching reading. In fact, they suggested that phonics should be discarded entirely.

Auditory Approaches: The phonic method has been in existence from almost the beginning of reading instruction. However, at the turn of the century, phonics fell into disrepute.

"By 1920, there was such a reaction against the phonic appraoch or any method of teaching specific words that no reputable school would done promote such techniques. These trends gave way to unstructured devlopmental reading programs which engendered a storm of protest from parents and teachers that the children were not learning how to read" (Mills, 1964).

Gray (1957) an outstanding pioneer in the study of reading summarized his conclusions in his Burton Lecture, "The teaching of reading" an international view". He gave particular attention to the conflict between the two

approaches - the mastery of word elements (phonics) and the use of sight vocabulary (look and say). He took a middle of the read stand and he mentioned the eclectic trend which emphasizes from the beginning both meaning and the skills of word recognition. He stated that "all children and adults do not learn to read equally well by a given method. This implies that there are factors other than the method that influences progress in learning to read, such as the teacher, the home and school environment and varying abilities and other chracteristics of the learners". Gray observer that most children usually perceive things (including words) as whole, often in accurately at first but gradually in greater detail.

In 1950s a research group in Nottingham England stressed the greater use of phonics. Dieck and Daniels (1954) stated that "an alphabet is a way of writing down the sounds of speech, that the order of letters ina word signifies an order of time that the idea that children see words as immediate wholes is based on careless observation of children who can be observed inthe process of analysing the words, that 'the general shape' of a word is purely adventitious, that the only logical visual analysis of printed word is into letters that in learning to read

children are infact learning to translate symbols of sounds (letters) into blocks of sound that make sense".

Thus phonics was added to curriculum and some phonic instruction has continued to be a part of most approaches to reading and remedial techniques ever since.

Kinaesthetic - Tactile Approaches - The kinaesthetic method has been described since antiquity. In "Protagoras", Plato described the early stages of learning to write by having a student trace the teacher's script. It is interesting that more emphasis was placed by the Greeks and Romans and earlier cultures on writing and speaking than on reading (Richardson, 1991).

Quintillion around A.D. 90 stated that "it is a mistake to teach children to repeat the alphabet before they know the form of the letters ... as soon as the letters are recognized they ought to be written. Following with a pen the form of letters engraved on ivory tables is a good thing. After letters syllables must be learnt, all the possible syllables in both languages (Latin and Greek). Next come the words, then sentences. As soon as the child has begun to know the shapes of the various letters, it would be no bad thing to have them copy as accurately as

posible upon a board so that the pen may be guided along the grooves".

Quintillian sounds quite modern in saying that good teachers will ascertain the disposition and abilities of their pupils so as to adapt their methods to each individual. In most instances those who advocated the kinesthetic approach used it as part of a combined appraoch, combined approaches are essentially multisensory utilizing all sensory avenus and approaches.

Combined Appraoches:

Fernald (1993) used for remediation the combined multisensory appraoch that is now called V-A-K-T (Visual-Auditory-Kinesthetic-Tactile) in analytic breakdown. Fernold used a four stage system for teaching reading. Another multisensory appraoch is the Orton-Gillingham approach where in they incorporated simultaneous oral spelling (SOS) and based their methods or Orton's neurological theories.

There is evidence that the multisensory or combined approahes to remediation for majority of individuals with

dyslexia have been successful over time. There is history of much dispute between the advocates of "look-say", the word method, and the phonemic approach. But no amount of arguement can decide, the question as to the best method of instruction in these cases.

Children with reading disability have not sufficiently negotiated the decoding stage and also lack the integration and automaticity ability to draw meaning from print. Reading Disabled students require explicit systematic teaching which involves a maximum amount of interaction with the teacher (Haring and Bateman, 1977). This approach is termed as direct instruction. Direct instruction incorporates methods for gaining and maintaining pupil attention. These methods may be as simple as arranging seating to ensure teacher - student eye contact or as imaginative as using puppets to demonstrate concepts.

Teacher modeling is another initial feature of direct instruction. To be as explicit as possible the teacher models exactly what the students are expected to learn.

In direct instruction, lessons are carefully paced to allow for extensive amounts of practice. Discrete skills are practised to ensure students. Monitoring and evaluating

student progress is another essential aspect of direct instruction. In direct instruction reading skills are taught to a mastery level. Gaining automaticity at basic skills is another critical instructional goal so that attention may be directed toward comprehension of what is read. More specific instructional recommendations-

A) Phonemic Awareness Training: because the phonemes that make up spoken words are abstract, phonemic awareness training often includes activities to make phonemes more concrete for eg. teaching children that the phoneme /f/ is the sound that an angry cat makes. Another approach is teaching children to attend to the shape of the mouth as particular sounds are produced developed a method in which phonemes are represented as a sequence of squares, as a word is spoken the student moves a token to a new square with each new sound, William (1980) modified this appraoch for use with reading disabled students. Each phoneme is represented with a block segmentation training is integrated with instruction in blending sounds together. Eventually letters are written on the blocks and decoding instruction begins.

Other programs encourage students to attend to phonemes by drawing attention to parts of the word. For example, in

a program developed by Bradley and Bryant (1985). Students are asked to attend to final sounds, to select which of the four words did not rhyme. Other word sets are used in which students are asked to select the word that has a different initial sounds or a different middle sound. Another approach to developing phonemic awareness involves asking children to add, omit, substitute and rearrange phonemes in words (Rosner and Simon, 1971),

Each of these programmes was successful in teaching children to attend to sounds in words, in addition, a number of them demonstrated transfer effects to reading tasks (Bardley and Bryant, 1985; Williams, 1980). Use of letters to represent phonemes may enhance transfer of phonemic awarness training to reading (Bradley and Bryant, 1985; Hohn and Enri, 1983). However, letters may overload the reading disabled student initially and it is recommended that letters be introduced only as proficiency is gained (Williams, 1980). Developing Phonics Skills - there are two approaches to teaching phonics. One approach referred to most often- synthetic phonics instruction - wherein first individual letters sound conrrespondences are taught and after mastery, uses them in syllables and words. The other approach is known as analytic phonic instruction wherein whole words are introduced and then the students are

encouraged to deduce the letter sound correspondences as they appear in those words. Words are selected on the basis of their phonemic patterns which are introduced systematically rather than for their frequency in children's vocabularies.

Synthetics Phonics Instruction - The Direct Instructional System of Teaching Arithmetic and Reading (DISTAR) now known as Reading Mastery (Engedman and Bruner, 1983) provides a good example of synthetic phonics instruction that is rigorous in its use of direct instruction techniques. DISTAR was designed to provide instruction to children at risk for reading failure in classroom settings. The reading curriculum comprises 6 levels which extend from preschool through 6th grade.

The 1st Level Reading Mastery I teacher letter sounds strongly emphasizing the oral pronounciation of these sounds, letter names are not introduced until reaching master II. Each letter sound is first said aloud by the teacher; students then imitate her pronounciation in unison. After oral presentation, the corresponding letter is shown in written form. A line diagram running from left to right underneath the letter helps pronounciation and demonstrates

the difference between continuous sounds (eg. 's''m', all vowels) for which students are instructed to move their finger slowly along the line as they pronounce the sound (eg./a/). For stop sounds (eg. /d/ /t/) for which they are told to trace the line quickly and say the sound first.

Letter sounds are introduced slowly with a great deal of review. Children learn to write the corresponding letter symbol from the very first lesson. Reading begins when 6 sounds have been learned. As the words are introduced the line diagram becomes a device to assist sound blending. Children are instructed to sound out a word first, moving their fingers slowly along the line as they pronounce the phonemes in the word and then to say the word fast. Irregular words are also taught in this way rather than as whole words, to emphasize those parts of the children's reading vocabularies and are incorporated first in simple sentences and later in stories.

Two particular features distinguish DISTAR from other synthetic phonics programs. One is that all lessons follow scripts; teachers are told exactly what to say and do, including how to correct or to anticipate student errors. As instruction is designed for small groups and unison responses, teachers use hand signals to direct the type and

timing of responses required. The other special feature of DISTAR is its modified orthography used in the early stages of the program but phased out by the middle of the Reading Mastery II. The modification is intended to compensate for the fact that there are many sounds than corresponding letter symbols in English language. To help children read words that do not follow phonic rules and to emphasize differences between visually similar letters. Silent letters are printed small, heavy macrons appear over letter representing long vowel sounds and consonant blends are printed as joined letters.

Unlike some of the other synthetic phonics programs DISTAR introduces comprehension activities from the very first lesson. Spelling instruction which in many synthetic phonic programs is totally integrated with reading instruction is separated and optical curriculum in DISTAR Albert strongly encouraged. The spelling curriculum follows the sequence of the reading curriculum. Although children are taught manuscript letter formations as part of the reading curriculum neither hand writing nor written are emphasized in DISTAR.

DISTAR has proven successful with children from disadvantaged socio economic backgrounds for whom it was specifically designed (Becker, 1977; Meyer, et al. 1983). It was also been used with students with a variety of problems that may lead to academic under achievement including learning disabilities. Primary grade learning disabled student who received DISTAR instruction had better reading achievement test scores than those who had another form of phonics instruction (Stein and Goldman, 1980). Although in several communities the program has been immensely popular with parents as well as teachers, some teachers find the scripts too restricting (Mezer et al. 1983) some children may have difficulty in making the transition from the modified to the traditional orthography.

Corrective reading (Engelmann et al. (1980) is a direct instruction program designed to provide remedial reading instruction to disabled reader in grades 4-12. Word recognition and comprehension skills are stressed.

Analytic Phonics Instruction: The Merriell Linguistic Readers (Fries et al. 1986) examplifies an analytic approach to phonics instuction, it teaches letter-sound correspondences within the context of words rather then as isolated units. The Merrill program emphasises word endings.

with invariable spelling patterns (Man, ran, dan) applying the principle of 'minimal contrasts* whereby children are taught to attend to word ending and then to note the varying initial consonant. This has also been called the word family' method. The high degree of consistency of spelling patterns among the words introduced enables children to read continuous text easily yas in this program (eg. the fat cat sat on a mat).

The program developed for use in first grade classroom comprises 6 readers and 6 corresponding work books. All new word patterns and any high frequency words not belonging to that pattern in which they first appear as well as being introduced by the teacher on the chalkboard. Only words having the same spelling pattern appear together in the early books; at more advanced levels, increasing number of different spelling patterns are included in the same text. Pictures are excluded in all the Merrill books to prevent distraction from the printed words. Because of the highly controlled vocabulary, the semantic interest level of the text is necessarily low. Comprehension activities as well as writing activities are at a minimum in the program.

The Merrill programme is one of more than 10 reading programs that use an analytic approach to phonics

instruction. Other worth noting are the SRA Basic Reading Program (Rasmussen and Goldberg, 1976) the Stern Structural Reading series (Stern and Gould, 1965) and the Glass Analysis for Decoding only (Glass and Glass, 1976). Because these programs avoid sounding out individual letters they may help children who lack blending skills. At the same time because they do not provide explicit instruction in phoneme - grapheme correspondence for most disabled readers they are best supplied after sounds have been taught. As yet no substantial research supports or negates the use of these programs with children at risk for reading disbility.

Developing whole word recognition - in addition to phonics instruction disabled readers often need help in building a repertoire of words they can recognize on sight. Word recognition is equally important for regular and irregular words.)

DISTAR advocates sounding out irregular words. the rationale is that in irregular words. Some correspondences are regular and provide some assistance to the reader. Also it is feared that presentation of a global whole word strategy may lead students to guess instead of attending to letter cues. In DISTAR the teacher sta es the irregular word, sounds it out as if it were regular and then states

the correct pronounciation. Students then copy the teacher model.

(Because children at risk for reading disability tend to become glued to printing and laboriously decode every word (Chall, 1983), they need to practice reading phonetically regular words quickly and accurately. DISTAR teaches explicitly the transition from sounding out to word recognition. The teacher models sounding out a word subvocally and then stating the word. Students then copy the model. Initially the teacher allows the students 5 second for subvocal sounding out a word this is eventually reduced to 2 seconds.

Computer assisted instruction (CAI) has been demonstrated to enhance disabled reader 'word' recognition skills. Learning disabled students made significant gains in their speed and accuracy with a list of single syllable phonetically regular words given practice with. The computer (Jones et al. 1987). Although still at a formative stage, CAI appears to offer certain advantages for word recognition instruction with at risk students. It offers extensive one to one practice within classrooms with a minimum teacher supervisory time (Torgesen et al. 1988) and

with a protection from potential embarrassment in front of classmates. It provides immediate response feedback to students so that errors can be promptly corrected. Some programs can monitor both speed and accuracy of responses and pace instruction according to mastery requirements. By incorporating game formants, CAI can alleviate the boredom of traditional drill exercises.

Evans (1982) discusses neurologically based remedial reading procedures.

(1) Multisensory approaches - he discusses the procedures put forward by Orton - Gillingham (1930), Gillingham and Stillman (1930s) and Fernald's tracing technique (1943) these procedures remain popular among reading remediation specialists, despite some warnings (Johnson and Myklebust, 1967) that they may overload the nervous system and thus actually lower learning efficiency. It is rather commonpractice today to experiment with the visual auditory kinesthetic tactile approach in individual cases by varying systematically the senses, simultaneously stimulated or blocked eg. V-A without K-T or V-K-T with an ignored (or partially or completely blocked with ear plugs).

(2) Perceptual motor training - The work of Strauss and Werner with brain injured mentally retarded children in the 1930s and 1940s stimulated in the development of many teaching procedures which were believed to help compensate for some behavioural effects of brain damage.

"Lehtiner an educator and a colleague of Strauss coauthored with him a text (Lehtiner and Strauss, 1947) in which some specific remedial suggestions were made. It was recommended that daily routines be established, that small group instruction be used, and that perceptual processing be facilitated by enhancing the "figure" (stimuli) to be attended to) while reducing the background distraction. The latter was to be accomplished by procedures such as requiring teachers to wear plain clothing, covering windows, permitting the child to face the wall while working, eliminating decorations from the classroom.

Quiet areas for the remedial sessions, use of wider spacing between words and lines of print and permitting the use of a finger, a cover sheet or a paper with a window cut out to maintain one's place during reading are specific examples of ways to minimise visual perceptual difficulties of the figure background differentiation type.

(3) Movement theapies - Cruickshank 1967; Kephart, 1971; Strauss and Kephart, 1955 - these writers focussed on usual perceptual and perceptual motor aspects of learning disability and were responsible in large part for the popularity of perceptual motor approaches to remediation of reading in the the 1950s and 1960s. Although such approaches are less popular today there are remedial specialists who continue to stress motor approaches, movement education or somatic education.

Movement therapists use a variety of remedial activities such as having the children engage in specific swinging, spinning, rolling and balancing activities designed to trigger antigravity responses inorder to facilitate integration of vestibular cerebellar impulses.

Some specialists in neurodevelopmental treatment (NDT) ie. Bobath (1971) method of working with cerebral palsied have considered, the application of movement education to children and adults with reading disability.

(4) Hemispheric specialization of function - Abnormal interaction between right and left cerebral hemispheres has been implicated for some time as a basic cause of many reading disabilities (Orton, 1937).

Delacato (1966) like Orton advocated development of lateral dominance in treatment of reading disorders facilitated by patching the eye, blocking the ear and/or placing the arm in a sling on the side that was to become non-dominant. This approach has been severely criticised.

Research on hemispheric function has led to some creative approaches to remediation Van de Honert (1977) used a stereo tape recorder and headphones and had learning disabled children listen to music in left ear and spelling list in the right ear. This would free the left side from right side interference and enable it to efficiently process verbal materials (spelling words in this case). This technique is more appropriate for those cases of reading disbility in which there is interference in language processing.

Growing number of educators showed interest in topics such as the education of both halves of the brain. And to educate the right hemisphere using techniques such as music, art, drawing, metaphorical reasoning, visualizing, dream interpretation, body movement and other such forms of creativity.

(5) Rhythmic Aspect of Language - reading involves the sequential processing of words within paragraphs, sentences or phrases in order to perceive and express correct syntax and meaning as well as the sequential procesing of the order of syllables and letter within words in order to recognize and "call" them. The movement therapists stressed the commonly observed lack of proper timing (rhythmicity) of movements in children with specific learning disabilities.

London (1975) conducted on experiment using techniques of "linguistic-kinestic" sound film analysis, he observed that in a self synchrony involving the simultaneous occurrence of organized units (patterns) of a normally functioning person's movements with specific aspects of his/her own speech. Listeners often shared a precise synchrony with the speaker and the two were engaged in a sort of dance - this was missing in children with reading problems. And suggested that these children be shielded from excessive noise and be spoken to quietly and in short sequences in order to help avoid sound overlap.

(6) Biofeedback - Several researchers have applied biofeedback procedures to treating learning disabilities

(Cobbs and Evans, 1981) Electromyographic and electroencephalographic biofeedback procedures most often have been used. Children generally have been able to learn both muscle tension and EEG control but concomitant improvement in academic skills was infrequent. The authors believed that techniques such as relaxation, meditation, hypnosis could relieve the reading disordered child of the anxiety he/she faces.

McCoy Vernon, John Develin Colesy and Jan Hafer DuBois (1980) studied the use of sign language to remediate severe reading problems. They discuss that the techniques that are successful with disabled readers usually have one of the 4 basic characteristics. Many are multisensory (Fernald, 1943). They involve tracing words, feeling sand paper letters or handling letters that are 3 dimensional. Others physically involve the child in the reading process. The 3rd and 4th characteristics are that the techniques motivate and that they involve idiographic languages. Idiographic language are picture languages such as some forms of Japanese and Chinese. They do not involve alphabet letters and phonetic rules. Among children who use such languages there are far fewer reading problems.

The American Sign Language and manual alphabet used by deaf people combine all of these desirable characteristics of remedial reading technique. The manual alphabet consists of separate hand position for each of the 26 letters of the alphabet.) Signs in contrast are individual hand movements that stand for an entire word or phrase. Many signs are idographic which makes them especially vivid and appealing. They motivate children and are easy to remember and associate with the reading of printed words. Similarly, many of the manual alphabet letters are alike in configuration to printed letters.

Thus sign language and finger spelling have fundamental characteristics that theroretically offer significant potential for use with children who have trouble learning to read or mastering language. Walker (1977) reports the use of sign language with class of reading disabled students at the junior high level. These students used the manual alphabet to learn sight vocabulary. The techniques proved to be both motivational and effective.

An experimental program using the manual alphabet to improve learning disbled chidlren's spelling skills was implemented in 3 resource room programs in Berkely County.

Children chosen for the project met 3 criteria: (1) Children classified as visual or haptic learners (2) They exhibited poor spelling skills (3) They were assigned to a second grade spelling test in the regular classroom.

The 3 resource room teachers volunteered to be trained in finger spelling by the teacher for the country's preschool class for the hearing-impaired. A total of 4 instructional hours wa.B needed to prepare the teachers for teaching finger spelling using the phonetic method. Insted of saying each letter as a word is spelled, one says the word while finger spelling which is analogous to the whole word technique used in conventional reading instruction. At no time during the introduction to finger spelling were the letters to be individually identified. Only 10 minutes spent on spelling everyday.

All 3 teachers reported that the children were able to read and finger spell the words after the 3rd instructional period. The children were asked to finger spell the words to the teacher individually. A receptive finger spelling test was given. The teacher finger spelt the word and the children called out the word that had been spelt.

They listed out interesting problems and solutions

a) Particular difficulty with blends - hence encourage child to use finger spelling.
b) For letter reversals use both hands. Start with left hand - for first letter, use right hand for second letter.

Sussestions are as follows;

1) Use of local teacher of hearing-impaired or deaf person as consultant.
2) Learn finger spelling from another person or from a book, never spell by saying each letter. Always say the word as you spell.
3) Keep time period spent as finger spelling from 10-15 minutes to make it as highly motivating as possible.

Specific combined Approahces:

The Orton-Gillingham (1937) approach - the procedures in this approach are principally designed to (a) overcome the tendency to reverse symbols and to transpose letters within syllables and words (b) strengthen and ensure visual-auditory association for alphabetic symbols through a

kinesthetic linkage (c) establish the necessary left to right sequential process for reading, spelling and writing. (d) strengthen mnemonic process and (e) provide a phonetic and syllabic basis for the building of an accurate and sufficiently extensive reading vocabulary. Theoretically Orton considered the kinaesthetic element particularly important for overcoming the tendency to spatial, directional and sequential confusion. The emphasis on sound symbol association is also based upon the assumption that coding with accuracy and facility is essential for comprehension in reading. This is a view that has found increasing support in more recent times. Although the first emphasis in the Orton -Gillinghan approach is to ensure with visual accuracy, correct phonological association and facile performance decoding is only the foundation in reading. The teaching of decoding encompasses a progression from graphemes to syllables to multisyllabic words with roots and affixes along with their meanings, so that the structure of English language is made explicit. Sufficient practice in both reading and writing is provided so that one reinforces the other while moving toward the goal of automatic decoding. Throughout this process there is the additional emphasis on vocabulary expansion and a steadily growing use of decoding in sentences and paragraphs in both oral and silent reading. Similarly using only those that are

unequivocal there is a planned order in the introduction of consonants.

Distinctive features of this approach - The teaching of decoding in Orton approach differs from other phonics programs in that the sequence, structure and pedagogical procedures are specifically designed to circumvent the learning problems so often associated with developmental dyslexia. It avoids the work book approach that is usually an important component of published phonics programs and often requires the child to work silently in the matching of letters and pictures or circling letters for the beginning sound of pictured objects. In this approach the building of the visual-auditory (grapheme phoneme) association and fixing them firmly in memory is constantly reinforced kinaesthetically in the initial learning stage through speech and movement. The pupils sees, hears says, traces and writes. he produces the sound for the letter he sees or the letter for the sound he hears. He reads, he spells, he writes.

An important aspect of this approach is that it is synthetic rather than analytic, in the teaching of the components necessary for decoding. The process begins with

the phoneme and grapheme provided to the pupil it does not require the selection by the pupil on the basis of his analysis of what is similar or different within a group of phonograms or words. Furthermore, it does not require phonemic segmentation from the pupil as a starting point but leads him to the awareness of such segments and how they are blended into larger units of syllables and words.

Early blending is an important aspect of this approach. With a minimum of graphemes learned, a few consonants and a vowel or two, syllables and short words are formed to be read, spelt and written. As additional consonants and vowels are learned the pupil reads, spells and writes detached syllables and pseudowords as well as real words. Not only does this insure that there is a firm grasp of the sound symbol correspondences but it demonstrates the syllabic nature of the language. Moreover it is at this point that the foundation is laid for the structural analysis that will be needed for more advanced reading later on. Another important outcome is that by working first with the most predictable elements of the language one to one correpondence of phonemes and graphemes and regular syllables and thus generating rules that they can rely upon, the pupils gain in two ways. First they develop a self confidence that serves them well while they are gradually

prepared to deal with less predictable components of written language.

Still another feature is the order in which the language components are introduced. For example, the phonograms are ordered, as they are presented, in a sequence that will circumvent visual and auditory confusions and simultaneously lead to a secure knowledge of syllable structure. The short rather than the long vowels are introduced first along with selected consonants. Using the principle of maximum contrasts to avoid or correct visual, auditory or speech production confusions and writing errors. Similarly, using only those that are unequivocal there is a planned order in the introduction of consonants.

Early in his research Orton found that merely teaching phonics was "hopelessly inadequate" without synthesis of phonetic elements into meaningful units and he stated this view forcefully - "we have repeatedly seen children referred to us as reading disability cases with the statement that the phonetic method had been tried but failed. In these cases examination has revealed the fact that while the teaching of phonetic equivalents may have been fairly complete the next and most cardinal step, that of teaching

the blending of letter sounds in the exact sequence in which they occur in the word, had not been attempted or had been poorly carried out. It is this process of synthesizing the word as a spoken unit from its component sounds that often makes much more difficulty for the strephosymbolic (dyslexic) child than do the static reversals and letter confusions (Orton, 1937).

Gillingham and Stillman Approach (1969 - This refers to the 5th edition of their work, there are earlier editions going back to the 1930s). Annma Gillingham a school Psychologist, worked with Orton as a research associate at the Neurological Institute. /Her assignment was to organize remedial techniques in reading and spelling in conformity with Orton's neurologial explanations By 1933 she had completed this task and had compiled a Detailed Description of Remedial Work for Reading, Spelling and Penmanship. The compilation includes outlines of procedures (eg. the steps to ensure visual - auditory- kinesthetic linkage) and specific details of the sequences to be followed in introducing letters and continuing oninto reading, spelling and writing. With Bessie Stillman and collaborator Gillingham expanded, this original work and it become more widely known and was used inschools and remedial centres. The manual is extensive inits detail of each topic, the

topic, the sequence of topics and teaching procedures whether for reading or spelling or penmanship. It is heavily illustrated with examples and word lists for the orthographic representation of each English phoneme and syllable structure affixes and spelling rules and generalizations with their occasional exceptions. The manual however makes a distinction between the application of the approach to the younger child and those who are in the upper elementary grades or high school. Hence the basis is the learning of 'phonograms' ie basic sound units which may be made up of single letters or letter combinations. The concepts behind the method are that if there is on weakness in a particular modality, whether it is auditory or visual, one can teach through another modality ie. teach to strengths; that the integration of the various senses can provide additional routes for the child's written language learnings and that all the senses working together are essential for the development of appropriate written language skills.

Here one commences with letters, then letter blends, analysis of blends and letters, followed by phonic analysis of regular words, polysyllabic words, with particular importance attached to syllable division. It is sometimes called the VAKT method (Visual, Auditory, Kinaesthetic and

Tactile interrelationships). Here emphasis is placed not only on the child following its own speech, but also on relating the visual symbols to sound and representing them in the way they are formed in writing. The idea is to train all of these modalities so that there is automatic production in writing spelling and reading, whether it is visual to auditory transmission or sound to motor programming. The Simultaneous Oral Spelling (SOS) technique is employed here. Typically the teacher says the word and the child then repeats the word reinforcing the sound and the auditory component. Next the child names the letters. This important component provides additional reinforcement to the child that letters can have both a name and a sound but, more importantly, reinforces the serial, sequential aspect of letter combinations, providing awareness of the detailed letter structure of words. Following repetition and the naming of the letters, the child then writes the word naming each letter as he writes. This is important in relation to translating the sound into a written equivalent and as a motor, tactile or kinaesthetic programme. Naming each letter is also important in relation to mapping out the correspondences. The child then repeats the word by reading it ie. the visual to auditory component. This also helps train auditory recall of sequence.

The Gillingham-Stillman technique involves learning phonograms by eight linkages:

Linkage-1: a card with a letter is "presented, while the teacher gives the name of the letter, pupil repeats. Once the name is known the procedure is repeated but now the teacher gives and the pupil repeats, the sound of the letter (visual-auditory, auditory kinaesthetic)."

Linkase-2: the letter is made by the teacher. Its orientation where to start in writing, and the direction of movement are discussed; pupil then traces over the letter, copies, writes it from memory and then with eyes averted (visual-kinaesthetic, kinaesthetic-visual).

Linkage-3: - the letter is shown, pupil names, teacher may move pupil's hand passively to form letter (visual-auditory; kinaesthetic-auditory).

Linkage-4: - teacher dictates the letter name; pupil writes (auditory-kinaesthetic; auditory-visual).

Linkage-5: - the letter is presented; pupil gives its sound (visual - auditory). This is the important linkage for reading.

Linkage-6: - teacher gives the name of phonogram; pupil gives its sound (auditory - auditory).

Linkage-7: teacher gives the sound, pupil gives the name of the phonogram (auditory - auditory). This is the important linkage for oral spelling.

Linkage-8: teacher gives the sound, pupil writes it (sometimes with eyes averted) and gives the name (auditory-kinaesthetic - auditory - visual). This is the important linkage for written spelling.

There are a number of basic drills which are aimed at reinforcing these links.

Fernald Method - an effective approach that emphasizes tracing and language experience sequence is presented by Grace Fernald (1943). It is also utilises a multisensory approch and in this respect seems very similar to the Gillingham-Stillman system. However there are a number of important differences eg. essentially it is a modified "look and say" method. It requires that the child use tracing as a medium for learning. Here the child learns the whole word rather than any kind of phonic analysis and synthesis

of the word. The Fernald Tracing Technique is particularly useful when teaching words which are irregular or new words that need to be learnt quickly and is also very useful for words which are required frequently but cause difficulty. It is actually a look, say and do method. Phonics is not involved. In practice the method is slow but it provides a method of whole word learning for the child to whom sounds mean little.

Stage-1: The child selects the word he wishes to learn. the word is written for the child by his teacher with a crayon in large script. As the child watches and listens, the teacher pronounces the word as she writes it. The word is pronounced slowly by syllables without distortion. Next the teacher demonstrates tracing with one or two fingers and pronounciation by syllables. This is paced so that the voice and finger begin with each syllable concurrent (V-A).

Now the child traces over the word, using the technique of his teacher. The child is told to trace and pronounce the word as many times as he feels is necessary so that he will be able to write the word without looking at it. No copying of the word is permitted.

Next, the word is written in different contexts, in a sentence/paragraph. The word should be typed out. There is no 'restriction on the words or subjects he chooses. A word file is needed to hold a child's words. This should be alphabetically indexed. These words should be reviewed periodically and the child refers to them to check his work from time to time.

Stage-2: is the same as stage-1 except that tracing is no longer required to learn a word. The child looks at the word he has requested his teacher to write for him and says it over to himself while looking at it. then he writes it without copying saying each part as he writes. As his vocabulary builds up, his stories become longer. When vocalizing a word it should not be a stilted, distorted sounding out of letters and syllables so that the word is lost in the process. It takes little practice to get the connections established between the articulation of the word and the hand movement. There should be a decrease inthe number of tracings. The average tracing period is about 2 months but ranges from one to eight months. No attempt is made to simplify the content written.

Stage-3: here the child learns new words directly from the printed word without having the word written for him. He begins to read books, in addition to his own writing, words he does not know are pronounced for him on request and underlined. The child studies the words by saying and writing them.

Stage-4: the child begins to generalize to new words from the words he knows. He is encouraged to read as much as fiction and or non-fiction as he wishes on subjects of his own choice.

To help him read more easily, the student is encouraged to look over material to find words, he does not know. the student is helped with the pronounciation and meaning of these before reading. Retention of new words is aided. In general, the approach here is to try and link various senses particularly using kinaesthetic or motor memory, programmes to aid the weak phonological or auditory coding memory that dyslexic children have.

Matching Task to Learner: advocated by Johnson and Myklebust (1967). They suggest that dyslexia can be sub-divided into two main areas - auditory and visual. Auditory dvslexics need more help in retrieving letter names in sequencing and

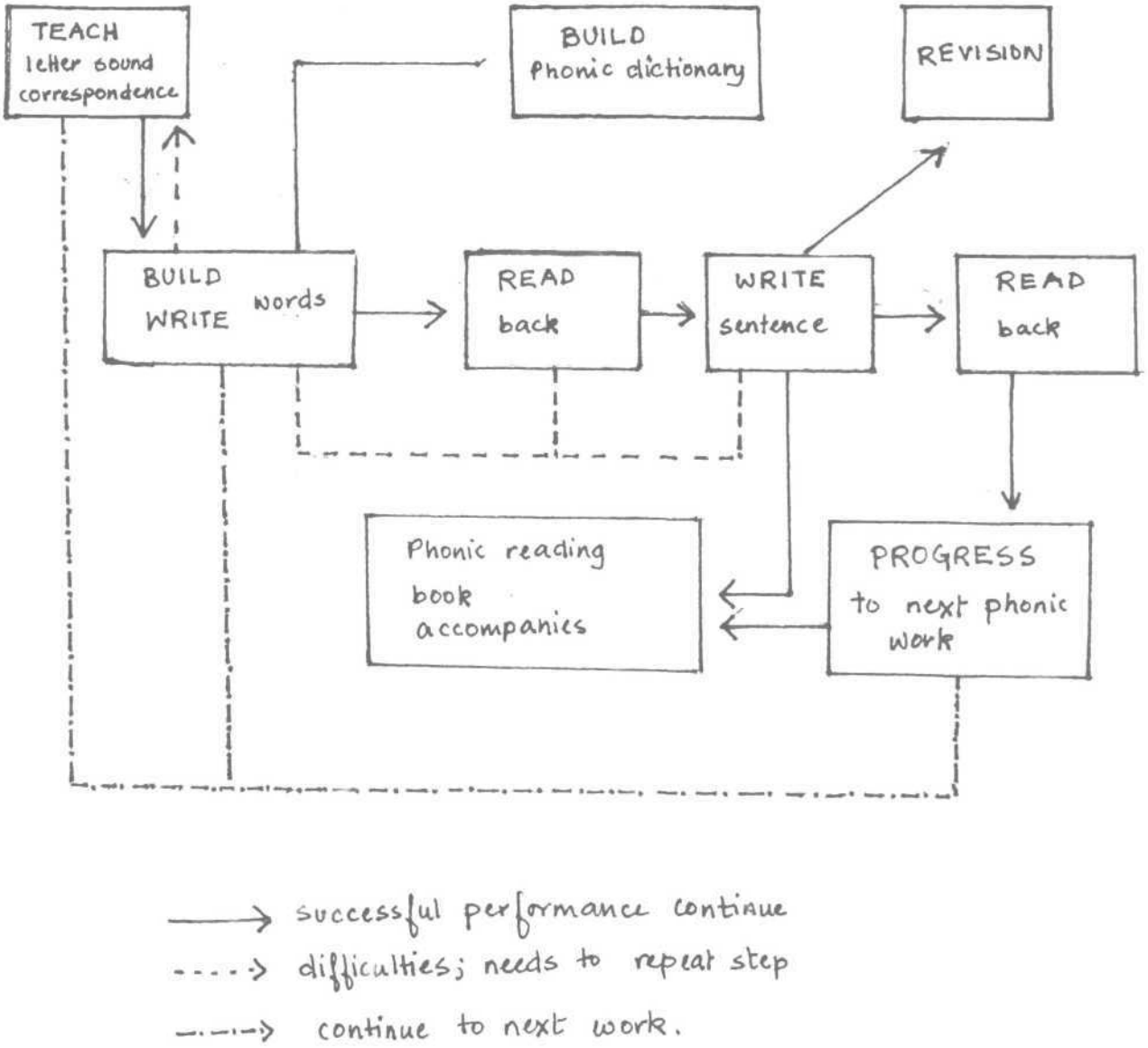
blending and particularly in techniques involving rhyme and syllabification. They will be taught using a whole word/story method, particularly matching pictures and objects to the printed word. Function words need to be taught in context and there will be some additional training in auditory analysis and synthesis particularly in sound similarities. Phonic rules will need to be taught very carefully. There will also be emphasis on syllable units and multisensory techniques such as the Fernald Tracing.

For the visual dyslexic - the emphasis is shifted and the authors suggest that they will need to be taught via the synthetic method. Synthetic refers to the construction of words and units from their constituent parts. It is suggested that there should be no learning of letter names but one learns individual sounds which are then blended together to form words and in turn these words form sentences. Sight words are taught only in context and there might be additional exercises in visual perception. It is emphasized by many remediators that this should be with the printed word itself and not through visual perception exercises.

The problem with this tidy system appears to us to be that few dyslexics are clearly either auditory or visual.

The majority have difficulties which cross the two frontiers.

The Bangor Teaching Programme - (Miles and Miles 1975; Miles, 1982, 1993) a structured teaching programme of the written language system. (A structured programme is a cumulative one in which one would start with letters, sound/symbol correspondences moving onto blends, regular words then polysyllabic words and syllable division). The Bangor Dyslexia Teching System is divided into two parts. The teaching materials inPart 1 was originally produced in 1978 in order to give detailed guidance to the special team of teachers at the Dyslexia unit, University College of North Wales, Bangor. ...



(Progression of work)

The current teaching programme recommends a number of reading schemes using phonic teaching methods and argues

that an overall look and say method is not suitable. The approach is flexible but suggests that one commences with consonants and vowels particularly emphasizing the structure of words to the child. This is followed by simple plurals, word towords, single vowels, long vowels vowel digraphs, c and g rules, various combinations of spelling patterns, irregular words, doubling silent letters, various odd combinations such as ch. /k/ and suffixes. The system assumes that the teacher will have a thorough grounding in the complexities of our written language system. They believe that dyslexics can be and are being taught to read and write at a level where they can fully use their other abilities. But to achieve this level they have to learn the sound system of written language in a systematic way. This needs to be taught within a structure and the teacher has to proceed in a carefully ordered sequences of small steps with the help of cumulative and thorough revision and over learning. They will then learn to use phonic cues , automatically for reading whenever needed along with context cues, while in writing they will be able to communicate intelligibly and fluently even if their spelling is not perfect. Multisensory teaching-basic literacy skills involve input from all the senses plus the contribution of the mind in interpreting this sensory information. The

linkages between written symbols (graphemes and spoken words (phonemes) must be taught explicitly and these are best learned by engaging all the senses simultaneously and also by ensuring that there is understanding. When children are given an auditory task, they should be provided with visual aids and vice versa. Writing should go along side reading whenever possible. At the same time the work should make sense and never slide into mere rote learning, throughout the pupil must be engaged in meaningful activity.

The learning should be made multisensory. The child should maintain an exercise book or file in which he can record all the spelling patterns as he learns them. Sentences to be dictated and noted in a book. These sentences should not contain any word containing patterns he does not know. Exercises and work books to be used.

Much repitition will be necessary. The emphasis is always to be on patterns rather than rules. The Bangor programme does not teach letter names as such but their sounds.

A briefing on the plan of Part I of the teaching programme - contain 6 sections.

I -> Concerned with single letter sounds and the structure of single syllable words, short vowels.

II -> Commonest long vowel patterns, final e pattern, vowel digraphs.

III-> Supplies basic checklist of irregular words which will be taught gradually.

IV -> More new patterns, less regular ones, involving silent consonants.

v -> Concerned with silent consonant patterns and with the less common sound correspondence of some two consonant combinations.

VI -> Concerned with word endings including common grammatical endings.

The following steps are followed:

Teaching the letters and their sounds

Teaching the linkages

Linkages drills with cards

Oral/auditory work

Using first letters for building words

Writing words/sentences

Reading and revision and review.

The Alpha to Omega programme - Hornsby and Shear 1976 - This is perhaps the most widely used programme. It was first published in 1976 at a time when there was really very little teaching material available for the dyslexic. It provides a good structure and guideline which is specifically designed for helping the dyslexic child. The strength of the programme is its very detailed and structured language programme. It follows a phonetic sequence with emphasis on following the spoken language of the child. The authors advocate starting with consonants and emphasize that these should be taught in the order in which they claim is the order of acquisition in spoken language. The programme is divided into 3 sections with test materials to assess the effectiveness of each taught part.

Stage-1: deals with monosyllabic words except where prefixes and suffixes can be added without changing the spelling of the root word.

Stage-2: deals with monosyllabic words, where one adds prefixes and suffixes where the final spelling of the root word does change.

Stage-3: deals with polysyllabic words, the peculiarities of final syllables and open and closed syllables are gone into more thoroughly.

In addition to and as a supplement of the programme, flash cards are provided which contain individual letters, letter combinations, root words, suffixes and prefix, games and exercises. The flash cards are really an essential aid and fulfil the potential of the language programme.

The Hickev Programme: was published a year later (Hickey, 1977) and provided a systematic, detailed structure. It was most detailed and called for specific training usually provided by the Dyslexia Institute. It was based largely on the earlier work of Gillingham and Stillman and was specifically tailored for the British Market (Americanisms were taken out and English language substituted). Kathleen Hickey devised this programme while she was the Director of Studies at the Dyslexia Institute.

The dyslexic child will not learn the written language system unless it is specifically taught and he is made aware of grapheme - phoneme structure. This is a problem for the dyslexic child as it is this precise area which is difficult for him. There is no real way around this difficulty, although one should attempt to make the system less orthographic and more ideographic in other words

provide mediational clues eg. a spelling or word pattern which the child can access immediately. One is trying to syllabify the written language to overcome short-term memory problems in the individual letter combinations, to aid sound blending and to provide some kind of immediate awareness to the child in his reading and spelling.

Example of material from dyslexia training course

on card	clue word	sound	irregular of (if any)
or	stork	(or)	

Helen Arhell Centre Programme - Pollack (1978) - is based on a structured approach. Emphasis is placed on the use of Edith Norrie letter case. It is a multisensory technique, building individual lettes into words by using small letter cards voiced/unvoiced vowels and consonants. the child has to follow his spoken word to do this. In this way, the child begins to analyse and build up phonemes, syllables and words and is so encouraged to become aware of speech sounds and process. They find that the Edith Norie letter case is of particular use with the youngest children who have greatest difficulties. They enjoy using it and find it a comfortable friend which aids them in a way that they understand and find helpful. This group has particular

problems in following their speech sounds naturally and has fairly serious auditory confusions.

The Aston Teaching Portfolio - published in 1982 (Aubrey et al. 1982) provided what was in effect, a very detailed and useful source of teaching material. The premise is that having used the Aston Index Screening test the information gained could be used to device a programme of work that would be tailored to the individual's specific needs, it would take into account both strengths and weaknesses. The programme rationale is based on the concept/philosophy of matching task to learner. Like Johnson and Myklebust (1967) it looked at auditory and usual modalities but emphasis was plced on the assessment checklist which acted as a guide to the teacher using it. Each task was broken into its component parts and remediation took into account each stage which a child would (it was reasoned) pass through on his/her way to written language proficiency. The advantage of this systemis its great flexibility.

For a child with poor sound symbol correspondence one would find the teaching of consonant blends, vowel digraphs, auditory discrimination activites, identification of initial consonants and sound blending useful.

The general frame of reference for teaching recommended by them is

* approach to be child centered based upon the individual learning profile.
* teaching to be based on a global awareness of the nature of literacy skills and the dyslexic child's dilemma and confusion within such a symbolic and arbitrary system.
* the ineffectiveness, therefore, of selecting odd bits and picks of generally recommended teaching techniques.
* using the strength oriented approach as the basic teaching method.
* remediating at the same time the specific weakness areas.
* each teacher selecting from an array of possible techniques those which succeed best for him/her.

The outline of their programme with suggested activities is under the following sub-sections:- I auditory and visual channel deficits

a) memory and sequencing
b) auditory discrimination
c) rhyming
d) auditory visual integration
e) aids to teach sound symbol correspondences of initial letters.

f) analysis and synthesis of sounds.

g) syllabification- useful mnemonics and pictogram.

II. Visual skills in reading

a) Teaching sequence

b) Can the child discriminate among letters?

c) Is the child still reversing letters?

d) Does the child have difficulty in remembering lettes and words?

e) Has the child experienced difficulty in developing a basic sight vocabulary?

f) Is the child alert to word structure (prefixes suffixes and compound words.

III. Developing spelling skills

A. visual approaches

B. auditory approaches

(i) teaching sequence for spelling patterns

(ii) teaching sequence for introduction of spelling rules

(iii) spelling rules for teacher reference

(iv) silent letters

(v) syllable division.

IV. Handwriting skills

a) has the child mastered the prerequisite skills for writing?

b) can the child hold a pencil correctly

c) is the paper correctly positioned

d) does the child have a good writing position

e) does the child have difficulty with manuscript writing

f) does the child find cursive writing difficult

V. Training comprehension skills

a) exercises for oral, reading and writing exercises

b) advanced comprehension exercises.

VI. Training use of context clues in reading (cloze procedure).

VI. Training the ability to sequence ideas for creating writing.

a) formulating and sequencing of ideas

b) semantics and expression of ideas

c) syntax

As far as dyslexics are concerned, moat specialists in this field. Thomson (1990) feel that dyslexics require a

specialist form of specific skilled teaching which may not be presently available in the ordinary classroom.

Syllable analysis is also a very important part of the learning process, especially as dyslexics have particular difficulty with segmentation of sounds, sequence and polysyllabic words (Thomson, 1984, 1990). Syllable analysis involves dividing words into units or beats. In the initial stages children tap or clap out the words into their syllables. A useful clue and rule guide is that all syllables in English contain a vowel and that syllables can sometimes be felt by putting the hand underneath the chin (when the chin moves it is a syllable). Thus in syllable analysis children learn to beat out the rhythm of syllables; then examine vowels (long or short) and undertake analysis based on the different types of syllables.

The children can be encouraged to spell words out syllable by syllable, work out what kind of syllable is present and write the appropriate spelling pattern for it. This technique is very useful for learning to read unfamiliar words, long words bothfor confidence and developing sophisticated word attack skills. It is also very helpful for spelling.

Syllable analysis in the format of "the 6 types of syllables is something which was originally pioneered in North America but has been adapted and developed to specific needs. Their presentation takes the form of a quest for the magic key word to unlock the words. To do this successfully a number of stages must be passed through and these stages link well to the idea of a quest. Simple drawings of keys may enable the children to remember easily both the concept ie. unlocking words as well as the actual code ie. CV or the like. There is a story for each key which can be used to elaborate the concept but the code is the neat formula that gives mastery of the process. This allows the dyslexics to capitalise on their good logical skills. This process is ordered and logical. With proper use there will be complete mastery over any word.

Reading Difficulties in India:

Thorndike (1973) in a survey of 15 countries on reading comprehension has shown that children in India were the poorest. Oomen (1973) points out that to a great extent school failure in India is probably due to poor reading achievement.

In India we are faced with a paucity of reading tests. Hence, we are forced to adopt western tests most of the time. However, adoption of Western tests in our multilingual set-up does not fully serve our purpose.

In Kannada the following tests are available

a) Devaki Devi (1978) - Reading readiness test - a modality based test which assesses auditory discrimination, visual discrimination and vocabulary.

b) Ramaa (1984) in her "Attempt at diagnosis and remediation of dyslexia" developed a test for school going children (6-10 years). Assesses auditory reception, visual reception, visual verbal association, word recognition, letter recognition, aural comprehension, word analysis testy reading , comprehension and academic achievement inventory.

c) Purushothama (1988) - diagnostic reading test in Kannada. This test is based upon the theoretical assumption that automaticity and orthographic rules are important precursors to reading. Test items include word lists, word pairs and passage reading. This test helps to identify good readers from poor readers on the basis of the factors of automaticity, rules of orthography and sequential processing.

Ramaa (1984) put-forth a remedial reading programme which was developed for and tried out on different types of dyslexics and was found to be quite effective in improving the Kannada reading performance among them. The remedial reading programme is based on specific principles of teaching reading to dyslexics. The important principles are over learning, variety of situations, familiarity of vocabulary used, clarifying sensory experiences, active involvement of the child in the learning process, meaningfulness of the learning experience, multisensory attack, verbalization, use of mnemonics, developing and sustaining motivation and immediate feedback. The programme is based on the distinct features of script of Kannada language. The script of Kannada language like that of most of the other Indian languages is characterised by one to one grapheme phoneme correspondence. The programme mainly constitutes teaching of Kannada alphabet "kagunitha" and other accessory forms and to give practice in word analysis and synthesis through a number of lessons. Each lesson has 2 specific objects (a) to provide opportunities to establish association between particular grapheme and phonemes (b) giving practice in analysis and synthesis of particular word.

The important freature of the programme is, it neither follows an alphabetic nor a whole word approach completely. It follows an eclectic approach. Since the lessons are cumulative in nature, there is adequate opportunity for the child to practice and to learn new letters. The child can make use of his letter knowledge and word analysis and synthesis ability in recognising and writing new words. This is also scope for practicing certain words which might be a part of the child's sight vocabulary. The child can make use of his memory for words and word analysing ability in recognizing letters. Thus learning of individual letters and words occur simultaneously and are mutually complementary. Thus, through these lessons it is possible to teach different types of dyslexics who actually have to be taught through different approaches.

It is found that this remedial programme which is developed for Dyslexics is equally effective in the case of educable mentally retarded children.

Evaluation Studies:

One idea in remediatinis that one can take some basic factor such as directional perceptual difficulty or a visuomotor integration problem and by providing appropriate

training procedures such as copying shapes, visual discrimination, matching sounds to taps or tactile presentation, one can remediate this basic difficulty. Reading, writing and spelling processes will thus improve. This idea has been quite common and is still widely used by many practioners today. Some of these approaches (Frostig, 1961) have useful concepts eg. finding the child's strengths and weaknesses are assessed and then remediated. For example using the Frostig Test of Visual Perception one might on the basis of this, suggest activities in finding shapes in pictures or improving speed of recognizing flash cards. In remediation of visual perceptual factors. Hammill (1972) reviewed 25 educational experiments and found 23 studies in which treatment groups on being given material such as suggested by the Frostigs test showed no difference in relation to reading improvement compared to a control group. The telling point here is that many of the studies showed an increase in performance on the Test. In other words the child is doing better at visual perception, visual discrimination and visual motor skills but not better at reading, writing and spelling.

A similar underlying factors approach is undertaken by Delceato (1963). Put simply this approach suggets that one

can train the brain by a series of neurological patterning exercises involving crawling, creeping and moving limbs in a strict and controlled fashion. This is claimed to develop cerebral lateralisation and therefore results in an improvement of reading and spelling skills. Robbins (1986) found no difference between control groups that were given unpatterned exercises and those that were given the Delacato to exercises - no improvement in written language or laterality.

Vernon (1971) argues that dyslexia is very resistant to remedial teaching and that even in adulthood individuals may still be poor spellers. There is a differential prognosis betwween dyslexic or specific reading disabled children and those who are generally backward. Yule and Rutter (1976) in their study found that children with specific reading difficulties lost ground compared to children who were generally backward in reading (of lower intelligence). Both groups were 33 months behind chronological age at 10 years but the retardates were a further 6 months behind the backward group on retest. This underlines the fact that one cannot assume that bright children will catch up in reading, writing and spelling.

In relation to multisensory techniques. Sherill (1978) argues that tactile learning improves alphabet recognition, serial ordering and learning distinctive features of letters - the letter transcribing word patterns by sound and shape. Linn and Ryan (1968) examined teaching first graders names and sounds by tracing and vocalizing as opposed to visual studying. Those given multisensory training improved the most.

Bradley (1981) examined the notion of multisensory and tracing techniques in spelling. Here reading retarded children were given a written word; a child names it then writes it from memory, saying the letter names at the same time. Next the child names the word again and checks that he has written it correctly he then practises the word for six days. Bradley found that children using this "SOS" technique had an 84% success rate whereas those who did not use a writing technique (ie. just simply visual and auditory inputs) had only 37% success rates and those not taught did considerably less well. In an additional experiment the child repeats the name of the whole word, but does not name individual letters. She found that a simultaneous oral spelling of letters was rather better, and argued that it was not just the motor movement ie. not the actual tracing

procedure itself that was important, but relating the motor movement to a sound pattern. She suggests that it is the organistion of motor patterns providing a one to one relationship between the sound and written symbol which aided discrimination, recall and subsequent organisation and provided help to verbal labels.

Another series of studies undertaken by Hulme (1981a and b) also provides experimental evidence for the efficacy of tracing or multisensory techniques. This study in particular is interesting in applying experimental psychology techniques to remedial methods. This surely is the best way to demonstrate that particular techniques and teaching methods are useful. In other words rather than trying to demonstrate increased reading over the whole range of the child's behaviours one pin-points, very specifically and in great detail. Some particular behaviour which relates to reading, writing and spelling learning and examines that in the laboratory. Hulme's study involved letter naming and learning visual/ verbal paired associates in various tracing tasks the argues that the tracing supports a phonological code ie. there is a kinesthetic memory trace which aids the phonological memory trace. This takes place in short-term memory. The interesting finding here is that when verbal material was used tracing

techniques improved the performance of the reading retardates but not the normals. When using nonverbal stimuli both groups improved. The control group presumably had adequate phonological memory coding and did not benefit in the verbal condition. This illustrates quite clearly that there are differences required in teaching techniques between dyslexics and other children who are poor at reading for different reasons.

Another area of research is inthe teaching 'subtypes' of dyslexia by various means.

Aubrey et al (1982) divided dyslexics into various subtypes of learning difficulty (auditory and visual problems). For one group of children with auditory problems various teaching methods were employed which emphasized the visual skills, another similar group had rather more emphasis on auditory skills and another group had a combination of visual and auditory techniques. Children with auditory and visual problems were given multi-sensory kinds of learning. There were a number of different groups of children who were given six hours teaching per week (2 hours for 3 days). The teachers undertaking the programme were rotated to control for teacher effect. They also had a control group of children who had been given various non

specific kinds of remedial techniques. They found that a combined approach was more effective when one used the strengths of the child. They found improvement in all children compared to the control group apart from those children who had auditory problems and who had been given a programme based on auditory techniques. It was concluded that one should emphasize the strength of the child in teaching and remediate specific weaknesses

Thomson (1988, 1989b) has undertaken a number of evaluation studies. Thomson (1988) looked at the spelling of non words and attempted to evaluate the phonological and orthographic skills appertaining to sound symbol association. Non words can only be read by a phonetic as opposed to a look and say strategy. The development of these skills in a group of children who have received remediation over a 2 year period was compared to development in children who had not received remediation. It was found that the non-treatment group had greater difficulty in using phonological skills to decode non words. Those who had received remediation had much better phonological skills. However, these skills were still weak when compared to control groups. Thomson also examined the use of simultaneous oral spelling and multisensory technique in the

teaching of spelling. This was compared to the visual inspection of words and it was found that the use of a simultaneous oral spelling technique was advantageous. It was concluded that some cognitive deficits could be overcome in dyslexics. Phonological coding, phonemic awareness and alphabetic skills could specifically be helped. However, nonlexical phonological spelling was particularly resistant, whereas lexical alphabetical skills could be improved considerably. In addition, help over phonemic awareness using kinesthetic coding can improve spelling. In a further study (Thomson, 1989b) on the spelling of regular and irregular words concluded that these appears to be an alphabetic "barrier" in the reading and spelling of regular words, which can be overcome around the reading age of 8 years. This seems to provide a platform for a relative 'take off' in aspects of written language learning. However, the irregularities of written language were much more difficult to remediate.

Gittelman and Feingold (1983) conducted a study of children with reading disorders - the efficacy of reading remediation. Inview of the lack of evidence for the efficacy of reading instruction, the authors conducted a study designed to investigate the efficacy of two interventions

1) reading remediation

2) methyl phenmidate in combination with reading remediation

To permit firm conclusions regarding the impact of reading remediations, the inclusion of children who receive equivalent attention but no instruction is crucial. Therefore, 3 groups were included: one received reading remediation and placebo, a second received an equivalent amount of attentionas the first group but no reading remediation or placebo, the third received remediation and methyl phemidate.

This study addressed the following questions:

In average IQ children with primary reading disorders does an 18 week program of motivated reading remediation -

1. enhance the acquisition of basic reading skills
2. enhance reading performance on individual and self administered tests of reading
4. affect performance on cognitive tasks
4. affect children's behaviour at home and inschool
5. have long term effects on basic reading skills and reading performance,

Children between the ages of 7 and 13 were selected. Results were obtained in 2 groups.

(a) motivated reading remediation- treatment was tailored to the child's reading level following principles of the phonics method. The intersensory reading method which stresses training in the reading process was used. Wherever possible whole word recognition was introduced to enable the development of smooth, efficient rapid reading and to avoid over reliance on phonetic word analysis.

(b) The motivated nonspecific academic tutoring - the purpose of this condition was to provide a control for non specific aspects of remediation such as the relationship between the tutor and the child, the tutors knowledge of the child's problems, the reinforcements for learning.

The children were seen individually at a clinic 3 times a week over an 18 week period for a total of 54 sessions.

The children were evaluated before and at the end of the 18 week treatment period. They were reevaluated at 2 and 8 months after treatment was terminated to determine whether gains were maintained over time.

The major finding of this study is that the use of an intensive phonetic teaching programme over a 4 month period induced significant changes in the reading ability of children with pure reading disorders. Remarkably the effect of treatment continued over time so that the children who had received reading instruction were performing upto 8 months after treatment ceased, significantly better than those who had not received such instruction. The long treatment differences were much less salient than those obtained immediately after treatment.

The results reported indicated that the active ingredient in the acquisition of reading skills for children with reading problems is reading instruction and that the psychotherapeutic or placebo factors in tutoring lead to very unimpressive changes.

Also they concluded that an exclusively phonetic approach to the remediation of reading may be insufficient to transmit the skills necessary for the mastery of broad reading skills. Also these results do not support the hypothesis that the enhancement of attention with stimulant treatment facilitates the acquisition of reading skills in children with pure reading disorders.

Lovett et al. (1989) report a study on specific and generalized treatment effects in Dyslexic children's response to remediation. A total of 178 reading disabled children were randomly assigned to one of the 3 treatment conditions providing training in word recognition and decoding skills (DS), oral and written language (OWLS) or classroom survival skills (CSS) (an alternative treatment control). Pre and post treatment comparisons on an array of standardized and experimental measures indicated that the two experimental treatments (DS and OWLS) resulted in improvement on selected tests significantly greater than that resulting from a third treatment intervention which controlled for treatment time and individual attention (CSS). Effects specific to each experimental treatment were identified as well as some generalised treatment advantages shared by both experimental groups at post test. These results indicate that some of the deficits associated with developmental dyslexia are amenable to treatment. Greater generalisation of treatment effects observed following the DS than the OWLS treatment. While DS instructed children exhibited better word recognition skills however their knowledge of grapheme - phoneme correspondence rules were not improved. Several OWLS specific effects observed on experimental reading and language measures were not

replicated on standardized tests which purport to measure the same skills. These results are discussed with respect to

(i) possible mechanisms by which disabled readers may acquire word recognition skills.

(ii) their failure to acquire and use grapheme - phoneme correspondence rules.

(iii) a possible reduced tendency in the present population to generalize newly acquired specific knowledge to related knowledge domains.

All of the programs shared a remedial educational focus: each of the 3 treatments attempted some form of cognitive or language rehabilitation or training of specific literacy skills.

The Decoding Skills Program (DS) is an instructional program in which attention is focussed exclusively on the acquisition of word recognition and spelling skills. The rationale for this treatment programme is based on the observation that despite the heterogeneity of the reading disabled population one feature that characterizes most disabled readers is the failure to acquire rapid word recognition processes at an age appropriate level. Since rapid context free word recognition processes are suggested

to be among those that most reliably distinguish good readers from bad readers, it was the goal of the DS program to train - these processes for both word recognition and spelling. Evaluation of the efficacy of the Decoding Skills Program was undertaken to address the following questions: Can the deficient word recognition processes of disabled readers be trained through intensive systematic instruction in this area? And if reliable improvements in word recognition skill are observed will these be accompanied by parallel improvement in other related reading skills. The enormous corpus of words which comprises the treatment content of the Decoding Skills (DS) program was subdivided into those words which are orthographically regular (ie. they conform to predictable grapheme-phoneme correspondence rules eg. Wade).

Regular words were taught ordered according to the difficulty of the grapheme-phoneme correspondence rule for that word family, exception words were taught ordered according to their actual frequency of use. Consolidation and automatization were included in the instruction of each word type. Training in phonetic analysis and blending rapid word recognition, morphological analysis and written spelling were addresed exclusively in the context of single

word presentations, no explicit training in reading comprehension, listening comprehension or the appreciation of sentence structure was included in the programme.

The second treatment intervention was the oral and written language stimulation program (OWLS). This programme was designed to remediate several different levels of the language system working at the level of spoken and printed language. Simultaneously the OWLS approach to treatment was developed based on another frequently reported observation that a majority of dyslexic or reading disabled children exhibit along with their specific under achievement in reading, associated disorders in some aspect of speech and language development. The goal of the OWLS programe was to treat higher order levels of the child's deficient language system with instruction concentrated on semantic and syntactic linguistic functions. The question of interest motivating evaluation of this program were as follows: are the higher order speech and language deficits accompanying developmental reading disorders amenable to treatment? And will concurrent treatment of a language deficit in both spoken and written form result in reliable improvement of these children's skills.

The OWLS program was developed through a well integrated programme of language stimulation and instruction. Intensive work on oral language comprehension, reading and writing comprehension were integrated and sequenced over a series of 4 day instructional cycles.

The classroom survival skills programme (CSS) was an alternative treatment control procedure in which subjects received the same amount of clinic time and professional attention as those inthe experimental remedial programs; instead of academic remediation however the control group received training in the areas of social skills, classroom etiquettes, life skills, organisational strategies, academic problem solving and self help techniques. Through discussion and planned activities this program worked at helping the children to acquire better study strategies, to organise their school work in the classroom and at home, to develop a better understanding of classroom expectations, to identify situations where they are having trouble learning and to acquire a new set of skills in getting the help or extra information they need in these situations. No direct instruction and no exposure to print was offered in this altenative treatment control program. A total of 40

treatment sessions were conducted within each program, children were seen in pairs in special laboratory classrooms at a paediatric teaching hospital. All treatment sessions were 50-60 min. in duration, conducted 4 times a week for a 10 week period.

Some of the deficits associated with developmental reading disorders are amenable to treatment. This report has demonstrated that 2 short term remedial treatments for developmental dyslexia can result in improvement significantly greater than that resulting from a third treatment have been identified, as well as a few generalized treatment advantages shared by both experimental groups at post test.

Because the majority of reading disabled children are handicapped by a pervasive word recognition deficits the DS program was designed to address the question of whether their deficit word recognition processes could be trained word recognition being generally considered the foundation upon which their literacy skills develop. DS instructed children exhibited a significant post test advantage in their recognition of both regular and exception words. The spelling skills of the DS treated children showed similar improvement: the children made reliable gains in their

knowledge of how speech sounds may be represented in print (pseudoword spelling).

Although the DS treated children made significant gains in their recognition of both regular and exception words, the magnitude of their post test advantage was greater for exception words. This was a surprising result since exception words are considered generally the more difficult word type since they must be learned individually by sight or rote methods and are incompatible with what the child may have learned about spelling sound pattern regularity (eg. broad vs. load, road, toad). The magnitude of these children's exception word gains following treatment indicates that they have acquired specific lexical knowledge through the DS treatment sessions. These results also suggest the amount of repeated attention to individual words that may be necessary for disabled readers to acquire new words of either type. This is a finding of considerable practical importance since a distribution of time and attention over several words has always been considered good pedagogy because the child is assumed to be learning a pattern which he/she will generalise to several words. On the basis of the present results however, it may be speculated that disabled readers will not profit from

training in grapheme phoneme regularity until the practice time for individual instances approximates that routinely allocated exception words.

The OWLS programme was designed from a somewhat diffferent pespective on what the most basic deficits defining developmental dyslexia may be and what may constitute the most effective approach to treatment. Based on the well documented observation that a majority of dyslexic children exhibit along with their reading failure associated deficits in some aspects of speech and language development The OWLS programme was developed to address the question of whether some of these higher order language deficits are amenable to treatment. This program also evaluated whether concurrent treatment of the dyslexic language deficits in both its oral and its written expression would result in reliable improvement of these children's language and literacy skills.

Newby, Caldwell and Recht (1989) report a study on"improving the Reading comprensive of Chidlren with Dysphonetic and Dyseidetic Dyslexia using story grammar". Five 8 year old children with dysphonetic and dysdeictic dyslexia were given instruction in reading comprehension using a story grammar strategy in which story instruction

was differentially designed to match the simultaneous or sequential mental processing strengths of each dyslexic subtypes. A multiple baseline single subject experimental design and statistical analysis indicated that the experimental treatments yielded statistically and clinically significant improvements in the proportion of qualitatively important story elements recalled by the subjects when compared to baseline traditional remedial instruction. The results suggested that students with dyslexia can increase their reading comprehension with training in metacognitive strategies. The question of whether the results were attributable to the subtype matched methods per se or to strategy training in general as well as a number of methodological issues is being explored in subsequent research. This study focussed instruction on the reading comprehension of the 2 subtypes of dyslexia. The treatments here were specifically designed to build upon the strengths of the children rather than remediate their deficits. This approach was guided by neuropsychological models of instruction that use methods that compensate for children's processing weaknesses by strengthening and diversifying their areas of strengths. Finally this study incorporated instructional methods and materials that are presently in use in many schools in the U.S. rather than novel laboratory

based procedures. Story grammar was taught as a strategy for understanding and remembering stories, narrative text comprehension was increased. The results provide initial evidence that children with dyslexia can benefit from strategy instruction to increase their recall of the qualitatively important ideas from reading passages to statistically and significantly higher levels. Children with dyslexia like normally achieving readers and delayed readers can effectively use metacognitive methods to organize their understanding of reading material. It was also observed that a smaller proportion of the dysphonetic pattern than those with dyseidetic pattern showed clear increases in the level of ideas recalled during the treatment phase.

Bakker (1990) put forth a neuropsychological treatment approach for his R-type and L type dyslxic subtypes. P-dyslexics presumably fail to shift from predominent right to predominent left hemisphere mediation of reading. These children may therefore profit from stimulation of the left cerebral hemisphere. L- dyslexics children presumably show predominant left hemisphereic control of reading from the on set of the learning to read process-they may profit from stimulation of the right cerebral hemisphere.

Two methods of hemispheric stimulation were developed Hemispheric specific stimulation (HSS) encompasses the presentation of letters and words in the left visual field or to the fingers of the left hand in the L-dysleic subjects and for the R dyslexic subjects presentation to the right visual field.

The other type of treatment method is called hemisphere alluding stimulation (HAS) and is accomplished by the presentation of transformed passages of text taken from normal reading books.

The transformation for L type was as follows - use of different type faces within printed words (eg. HIgGELty, pOp). This kind of transformation increases the perceptual complexity of the words. The transformation of text carried out for R types concerns the erasure of words within the text subsequently to be guessed by the reader on the basis of context. It also concerns inclusions of rhymes. eg. "whenever I walk in a London street, I am ever so careful to watch my_____". Texts thus transformed are semantically and phonetically demanding. Perceptually demanding texts on one hand and semantically/phonetically demanding texts on the other will presumably evoke predominant processing by the right and left hemispheres respectively.

35 L-type, 35 R-type 10 year old children were studied, with an average reading language of 3 years and were pseudo randomly divided into 5 treatment groups. There were 22 treatment sessions, one session per week each session lasting for 45 minutes. Reading and spelling performance were pre and post tested.

The results were as follows:

(i) fluency of reading in HSS treated 8 dyslexic children improved notably during single word reading.

(ii) accuracy of reading in HSS treated L dyslexic children improved only marginally in text reading.

(iii) improvements tended to level after the 16th treatment session (ie. half way through the treatment).

While reviewing the results of visual and tactile HSS treatment in L and P dyslexia, one if inclined to conclude that visual HSS is R dyslexic subjects. Elsewhere the author has offered a possible explanation for these phenomena. Visual HSS involves fast flashing of words which seems appropriate for the fast L style of reading, whereas tactile HSS entails the slow exploration of words, which may initially fit in best with the relatively slow reading style of R- dyslexic subjects.

Each of the schemes are programmes reviewed here has its uses. There is evidence that the multisensory or combined approaches to remediation for the majority of individuals with dyslexia have been successful over time (Richardson, 1991 a). The eventual aim should be to become familiar with each of the above programmes 30 that each system is seen as a useful resource to be utilised as and when needed. For example, it maybe that input from the Gillingham-Stillman Programme with regard to multisensory teaching of consonant blends can be adopted and used to good effect whilst underpinning of this may be enhanced by the use of the Bangor Teaching Programme together with some additional material from "Alpha to Omega". In this way a good breadth of input is given selectively. This will of course imply the principle of over learning - a vital weapon in our armoury. The danger inherent with the concept of over learning is that of boredom - a dreaded disease. This is particularly applicable to the young highly intelligent dyslexic.

Hinshelwood (1917) pointed out that even in the beginning of the century there were differences of opinion with regard to the "best method" and he also conceded that "no amount of arguement can decide the question as to the best method of instruction in these cases".

Johnson (1978) suggests that there are several terms of reference in deving a teaching programme. One is broadly psycholinguistic in other words assuming that there are input, integrative or mediation processing and output problems. Disturbances may be based on any one of these particular aspects and also involve any modality such as visual or auditory. Another approach might be auditory versus visual learning. The particular frame of reference one has given use to the particular kind of techniques that one describes (Vellutino (1979) uses the information processing approach giving importance towards attention to acoustic and visual features - be it training for phonetic segmentation and awareness, in sound symbol associations in natural language and finally in respect to accessing higher order language components. Others such as Johnson and Myklebust (1967) argue that one emphasizes strengths to provide immediate successes in areas within the child's grasp but also provides some kind of additional remediation or training programmes to improve deficits.

The nature of the difficulty together with that of the task calls for an appraoch that addresses directly the areas which the dyslexic child finds so troublesome and at the same time allows them to learn in their particular way.

When one works with dyslexic children who have difficulty in immediate learning retention and late recall of sound symbol information it is sensable to use all possible ways to facilitate the task. Multi-sensory procedures for presenting sounds and words and to aid response and memory are an essential feature of the teaching approach. Two or three senses are engaged simultaneously with speech. In this way stronger channels are utilised to the fullest extent and each channel supports the others. Thus, remedial rescue programs are designed to help children whose literacy skills have not developed at a expected level. Thus the present study seeks to evaluate the efficacy of a remedial program partly based on the Astom teaching programme involving the integration of the auditory, visual, kinesthetic and tactile modes and highlighting remediation of visuomotor perceptual aspects and oral and written language aspects.

Need for the study:

The present study focusses on the remediation of reading disability in school going children. In a country like India the problems faced by dyslexic childrn coming from non-English speaking backgrounds attending English

medium schools are innumerable. The success of a remedial programme thus depends upon the areas it attempts to remediate and the approach it utilises. The role of metalinguistic strategies and mata-phonological skills in the reading processes is highly debatable. Also the contribution role of explicit skills in speech segmentation to development of reading and writing is to be considered. hence, this study aims at evaluating the efficacy of a remedial programme based partly on the Aston Teaching Programme, also incorporating aspects of metalinguistic metaphonological, speech segmentation skills, visuo-perceptual aspects and oral and written aspects of language. Thus an attempt is being made to evaluate the effectiveness of a "total" programme in remediating the problems of the dyslexic children.

METHODOLOGY

The review of literature on the remediation of reading disability reveals that remedial aspects ranged from traditional methods that utilised neuropsychologically based principles, and non verbal techniques to a gradual shift to modality specific techniques and other techniques that emphasized pronics instructional methods. The question that keeps recurring is what could be the most effective approach to remediation. Various authors have put forward their view, their approach and subsequent studies to prove the effectiveness of their approach. This question becomes more relevant in the Indian context where we have a vast majority of children coming from non English speaking backgrounds attending English medium schools. Amongst these children there exist a few who perform poorly in their school work (in aspects of reading, writing, spelling) and on further probing are diagnosed as developmental dyslexia. The present study was undertaken to evaluate the efficacy of a remedial programme in English in a small group of dyslexic children, based on the Aston Teaching Programme. A few modifications were incorporated such that the remedial programme encompassed the areas of -

(1) Auditory-visual channel deficits

(2) Specific spelling rules and cues

(3) Visuomotor perceptual aspects

(4) Reading, oral and written expression of language.

Three subjects were chosen who were provisionally diagnosed as developmental dyslexia. A pre-therapy evaluation was carried out using the Early Reading Skills test proposed by Rae and Potter (1971). Therapy was given for a period of six months following which a post therapeutic assessment was carried out.

Subjects:

Detailed profile and history of cases chosen

Case	-	A
Age	-	7.3 years
Class studying in	-	Standard II
No.of years of education	-	4 years
Mother tongue	-	English
Psychological evaluation	-	Average intelligence

Audiological evaluation - Hearing sensitivity within normal limits. The case reported to the All India Institute of Speech and Hearing, in December, 1993. The problem was brought to the notice of the parents by the school teacher. The main complaints were - frequent errors in spelling, confusion over the letters p, q, b, d, inattentiveness in

class, slow to respond, and does not mix with his schoolmates. History of delayed developmental milestones, and drooling present.

The child faced difficulty in carrying out classroom instructions, in copying from the board, in carrying out oral instructions, slow in finishing work. Behavioural history revealed that the child is clumsy, too sensitive, has a preoccupied appearance, and showed inconsistent auditory response. There had been no change in medium of instruction in school.

Case	-	B
Age	-	12.6 years
class studying in	-	Standard VII
No.of years of education	-	8 years
Mother tongue	-	Kannada
Psychological evaluation	-	Average intlligence
Audiological evaluation	-	Hearing sensitivity within normal limits.

The case first reported to the All India Institute of Speech and Hearing in May 1994 with the complaint of errors in spelling, poor performance in school and fear of examinations. The problem had been persisting since the past two years.

Problems reported were difficulty in copying from the board, in carrying out oral instructions, tries to avoid reading, does not enjoy looking at books or being read to and has extreme fear towards examinations and the teacher. Behavioural history revealed that the child is too sensitive, fears making a mistake and shows frustration over even simple failures. There has been no change in medium of instruction in school.

Family history is positive, case's elder brother had similar problem but apparently overcame it without any intervention.

Case	-	C
Age	-	13 years
Class stying in	-	Standard IV (repeating this class)
No.of years of education	-	8 years
Mother tongue	-	Telugu
Psychological evaluation	-	Above average intelligence
Audiological evaluation	-	Hearing sensitivity within normal limits.

The case reported to the Institute in May 1994 with the complaint of spelling mistakes in the languages English and Kannada, confusion of the letters, b, d and poor academic achievement. The child had attended therapy for a period

of six months at a private clinic wherein there was no significant progress.

The child faced difficulty in carrying out classroom instructions, in copying from the board, was slow to finish work, continued failure even after constant guidance/supervision, tried to avoid reading and had a negative attitude towards schooling. Behavioural history revealed that the child is too sensitive and shows frustration over simple failures.

Assessment Test

The test used to assess the children's performance was "Early Reading Skills' proposed by Rae and Potter (1981). This test assess the following areas -

(1) Alphabet Identification (Upper and Lower case)
(2) Alphabet Recall
(3) Visual Discrimination - 2 parts
(4) Auditory Discrimination
(5) Phoneme Grapheme Correspondence - 3 parts
(6) Structural Analysis
(7) Oral Reading
(8) Writing -> Spontaneous
Copying

This test was chosen as it provides an assessment of a wide range of reading, ranging from initial perceptual discrimination skills to more complex structural analysis of words. Almost all spheres of reading haave been included in this test. The authors had designed this test as an aid to teachers for an educational assessment of reading disability. It gives adequate information on immediate learning. Materials are simple and provide sufficient information to recognize specific pupil needs.

The test included the following Sections:

(1) Alphabet Identification - involved identification of upper and lower case letters.

(2) Alphabet recall - involved recall of upper and lower case letters.

(3) Visual Discrimination - in Part l,the task is to match figures such as •, from a group of 4 figures. In Part 2, letters and words were used eg. gh, sob, awb.

(4) Auditory Discrimination - here the task is to identify whether the two words said are similar or different
eg. pat - pad

(5) Phoneme Grapheme Correspondence
Part 1 (A) The initial letter is written and following it five words are given. The child has to

identify the word beginning with same consonant.

(B) Similar task for ending consonant.

Part 2 The task in the 3 sub-sections is to write the letter at the beginning of the word, ending of the word and beginning of the blend.

(6) Structural Analysis - tasks involving completing sentences with the appropriate word, choosing appropriate plurals, tense marker (past tense) and affixes.

(7) Oral reading - different levels of reading paragraphs are given. The child is asked questions on the particular paragraph.

(8) Writing - Task is to make the child do both spontaneous and copy writing.

Therapy Programme:

A few general principles were incorporated and following in the therapeutic sessions:

(i) One third of the session was devoted to revision of previous day's work.

(ii) The new material was presented frequently and in a number of ways.

-> In order for the learning to be optimal the following stages were followed - recognition, recall, relearning and recall.

-> The learned material was presented in a variety of situations so that the child can generalise his knowledge.

(iii) The remedial activities were novel and changed frequently so that the children were not bored or demotivated.

(iv) In view of the dyslexics inherent difficulty with the written word a number of strategies were introduced

-> systematic organistion of word families

-> different strategies for spelling

-> use of mnemonic devices to help with phonetically irregular words.

(v) The children were constantly reinforced through bonus points and small rewards. Thus reinforcements formed a strong motivational factor.

(vi) It was ensured that - (a) the children were actively involved in the learning process rather than passively assimilating the information.

(b) the children were continually busy at a meaningful task during the remedial session.

Immediate feedback was given to the children on his responses to help them evaluate the adequacy of their response.

The Aston Teaching Programme (Aubrey et al. 1982) was chosen as it is a detailed useful source of teaching material. It takes into account both the strengths and weaknesses of the child, uses a combined approach of auditory and visual modalities and involves a systematic approach to enable a child learn any task. Each takes is to be broken into its component parts and remediation took into account each stage which a child would pass through on his/her way to written language proficiency. The advantage of this approach lies in its flexibility.

The specific areas that were worked upon were:

1) Auditory-visual channel deficits-emphasis laid on aspects of discrimination, sequence, memory, identification of vowels, perception of rhyme, word families, sound-symbol correspondence, analysis and synthesis of sounds and syllabification.
2) Specific spelling rules and cues - the following were worked upon - regular plurals, complex plurals, magic 'e' double rules, change rule, soft c and hard c, soft and

hard g,silent letters, words beginning with qu and use of mnemonic devices. Simultaneous oral spelling and syllable division was used to approach a new word.

3) Visuomotor perceptual aspects - the following were emphasized - body awareness and motor control, body awareness and laterality, directional awareness, following complex sequential commands, visual and auditory sequential memory, visual recall memory, visual figure ground perception and visual search activities.

4) Reading, writing and oral expression of language -

(i) Training in area of comprehension skills - listening comprehension, encouraged questioning, thinking, discussion, description of pictures, and of stories read out to them.

(ii) Use Of context clues in reading - worked upon punctuation, used reading passage accompanied by pictures, implementation of word decoding strategies to read difficult polysyllabic words, encouraged use of syllable division and phonic knowledge. When the task was extremely difficult the children would be briefed about the reading passage.

(iii) Oral expression - word building games (on basis of similar meaning, same sound), completion of sentences, formation of sentences, story narration, narration of interesting events that took place in

their school or home - following which the other children would either ask questions or be asked questions and lastly engaging the children in general conversation.

(iv) Written expression - expanding their vocabulary in terms of description of a particular topic, sentence formation given nouns/verbs or adjectives elaboration on parts of speech - nouns, verbs, adjectives, usage of auditory and visual closure activities. All new words introduced were noted in a separate section in their notebook.

The modifications made with reference to the Aston Teaching Programme were in terms of addition of remedial activities in aspects of oral and written expression of language and visuomotor perceptual aspects. Case B and C come from non-English speaking background hence their oral and written expression level was below age level. These goals were incorporated to enable the childrn approach the language in a systematic fashion, gain confidence and command over the language. Case A faced less difficulty with the oral aspect but written aspect required monitoring. The visuomotor perceptual aspects were worked upon since the children did face difficulty with commands

involving directional aspects, laterality aspects and coordination of visual, auditory and motor aspects. As the complexity of the command increased the children found it difficult to execute it. Hence this aspect was added onto the remedial programme.

Remediation is most complete and successful when all avenues of approach are fully utilized. Proficiency in reading goes hand in hand with proficiency in spoken language hence a remedial system that deals with both the aspects constitutes a complete programme.

The results obtained are presented and discussed in Capter IV.

RESULTS AND DISCUSSION

The present study was undertaken to evaluate the efficacy of a remedial programme in English in a small group of dyslexic children based on the Aston Teaching Programme. A few modifications were incorporated such that the remedial programme encompassed the following areas:

(i) auditory-visual channel deficits
(ii) specific spelling rules and cues
(iii) visuo motor perceptual aspects
(iv) reading, oral and written expression of language.

The test used to assess the children was the 'Early Reading Skills Test' proposed by Rae and Potter (1981).

The children attended therapy for anapproximate period of 6 months. The session lasted for 1 1/2 hour, all 5 days of the week. There is individual variability in the number of sessions each child attended.

Pre-therapy evaluation

The Early Reading Skills test has been administered on normal children from Class I to Class VIII (Monika, 1995)

Table 1

	Case A			Case B			Case C		
	Pre therapy	Normative Data	Difference	Pre therapy	Normative Data	Difference	Pre therapy	Normative Data	Difference
Alphabet Identification	26/26	STD IV	+2	26/26	STD VII	Age app.	26/26	STD VI	-
	24/26	STD V	+3	26/26	STD VII	"	24/26	STD VI	-
Alphabet Recall	26/26	STD V	+3	26/26	STD VII	"	26/26	STD VI	-
	26/26	STD VIII	+6	25/26	STD VIII	-3	26/26	STD VII	+2
Visual Discrimination	15/16	STD IV	+2	16/16	STD VII		15/16	STD IV	-2
	15/17	STD VI	+4	17/17	STD VIII	+ 1	11/17	STD I	-5
Auditory Discrimination	29/30	Below STD I	-1	30/30	STD VII	-	30/30	STD VII	+1
Phoneme Grapheme Correspondence Part 1									
A	23/30	Below STDI	-1	15/30	Below STD I	-6	29/30	STD II	-4
B	15/30	"	-1	14/30	"	-6	25/30	STD II	-4
Part 2									
A	9/18	STD II	-	18/18	STD VIII	+1	16/18	STD IV	-2
B	3/15	STD I	-	13/15	STD V	-2	13/15	STD V	-1
C	Unable to do	Below STD I	-1	19/20	STD IV	-3	20/20	STD VI	-
Structural Analysis	0/10	STD I	-1	1/10	STD I	-6	4/10	STD III	-3

Case A : Age 7 years / M Mother tongue :English

	Alphabet identification		Alphabet recall		Visual discrimination		Auditory discrimination
Scores	26/26	24/26	26/26	26/26	15/16	15/17	19/30
Age level Functioning at (based on normative data	STD IV	STD II	STD V	STD V	STD III-IV	STD II-III	STD VII

	Phoneme-Grapheme Correspondence Part I		Phoneme-grapheme Correspondence Part II			Structural Analysis
	A	B	A	B	C	
Scores	23/30	15/30	9/18	3/15	Unable to do	1/10 poor performance
Age level functioning at (based on normative data)	Below STD I	Below STD I	STD I	Below STD I		STD I

Reading: Substitutes sounds, slips lines, makes guesses or says words that look similar or start in the same way, confuses vowels, poor approach to a reading task. Prefers being read to rather than reading himself.

Writing: Omits letters,word endings, substitutions are frquently present, regularises irregular words, confuses vowels, spells phonetically, mixes capital and small letters, reverses letters, gives correct letters through in wrong sequence.

Case A did exceptionally well in the sections of alphabet identification and recall. The reason could be attributed to the fact that the child had obtained an extensive grounding in the LKG and UKG classes - which were not available to children on whom norms were based. Visual discrimination scores was fairly good on figure tasks but poorer performance seen in tasks involving letters.

Case B : Age 12.6 years / F Mother tongue :Kannada

	Alphabet identification		Alphabet recall			Visual discrimination	Auditor-discrimination
	A	B	A	B	C		
Scores	26/26	24/26	26/26	25/26	16/16	17/17	30/30
Age level Functioning at (based on normative data	Age appropriate		Above average Averge		STD VII (Average)	STD VII	STD VII

	Phoneme-Grapheme Correspondence Part I		Phoneme-grapheme Correspondence Part II			Structural Analysis
	A	B	A	B	C	
Scores	15/30	14/30	18/18	1/15	19/20	Poor performance 1/10
Age level functioning at (based on normative data)	Below STD I Significantly below average functioning below STD I (A, B) STD IV (C)	Below STD I	STD I Average performance STD VII STD VIII	Below STD I		STD I Significantly below average STD I

Reading: Mispronounces words, substitutes words, reads through punctuations, makes guesses or says the word that looks similar or starts the same way.

Writing: Omits letters, word endings, adds letters, omits second letter in blends, confuses vowels, spells phonetically, regularises irregular words,reverses letters, gives correct letters in wrong sequence. Use of grammatical structures - especially tense markers - extremely poor at this task.

The tasks of alphabet identification, recall, auditory visual discrimination pose no problems. Poor performance is evident in the phoneme grapheme sections where the child is functioning significantly below average.

Case C : Age 13 years / M Mother tongue : Telugu

	Alphabet identifi-cation	Alphabet recall	Visual discri-mination	Auditory discri-mination

and hence normative data on Indian children has been obtained.

For each case the scores on the subtest have been noted and compared with the normative data available (Monika, 1995).

Reading: Mispronounces words, substitutes words, makes wild guesses,makes guesses or says a word that looks similar or starts in the same manner. pays less attention to punctuation.

Writing: Omissions, additions present, does not pay attention to subtle differences between sounds, omits vowels, spells phonetically, reverses letters, regularises irregular words, gives incorrect sequence of letters. Poor performance in spontaneous writing-inability to formulate grammatically correct sentence.

The child is functioning at the appropriate age level in alphabet identification and recall tasks. The visual discrimination section involving letters shows that he does jumble up the sequence of letters. His performance is the phoneme-grapheme correspondence section indicates that he does face difficulty in identifying consonants in initial and final positions. He seemed to have less difficulty with blends. It is observed that the scores of all the 3 cases is not identical but all three have difficulty at the level of phoneme-grapheme correspondence.

The results raise questions on which aspects in the remedial programme should be emphasised "inclusion of goals on visuomotor perceptual aspects (that indireclty handle, tasks of sequencing, memory discrimination)", "oral and written aspects f language", "should the teaching concentrate on developing the weaker modality or extend to the stronger modality or combination of both?".

Blank (1978) argues that teaching a dyslexic is very different from teaching blind, deaf or other children with communication or learning problems. The dyslexic child must be taught precisely what is difficult for him. One can attempt to circumvent particular deficits by teaching in a different kind of way, but in the final analysis the child will need skills such as applying phonological rules if he is to read, write and spell appropriately. For example, there is a limit to what can be achieved by purely visual methods; one must get to grips with sounds eventually.

Teaching approaches differ depending on the initial frame of reference used. Sometimes the same terms are used to describe different kinds of approches. For example, the word multisensory may apply to the Gillingham-Stillman or the Fernald programme, that are different in some important ways. Similarly, a socalled "phonic approach" might suggest

that the individual has to analyse the sounds into the costitutent parts and then blend them together. Alternatively some kind of synthesis may be emphasized. Nevertheless it soon becomes apparent that there are cose agreements between various writers in relation to the principles that should be used for the dyslexic child. Rawson (1975) stated that the programme should be structured, sequential, cumulative and thorough-

* The notion of structure suggests that there should be an organized and coherent presentation of the written language system. It also implies systematic teaching of the rules, regulations and orthography of the written language system.

* The idea of a sequential programme implies that there is a gradual disclosure of sounds, letter combinations and orthography of the written language system.

* A cumulative programme implies that there is a gradual build up of the written language learning process. Rules, regulations are not taught in isolation.

* Thoroughness encapsulates the above and it should be ensured that eachstage is fully learnt before going onto the next stage.

Although different authors differ slightly in their emphasis most agree that some form of multisensory learning is required.

Sampson (1976) in her summary of teaching principles for the dyslexic states these principles as (1) an individual approach (not necessarily individual teaching, but attempting to examine the child's specific difficulties and provide anappropriate teaching programme aimed at the individual, and (2) some kind of multisensory technique (3) over learning of structure, the rules and regulations of the written language system (4) teaching to the strengths and remediating deficits. The teaching should be sympathetic. This implies providing the children with self esteem, in letting them know that one understands the nature of their difficulty and helping to circumvent some of the secondary emotional problem arising from the written langauge difficulty itself.

Another important consideration is the aspect of carry over from the therapeutic situation to school work, to ensure that the teacher in charge is sensitive to the needs of the dyslexic child and an integrated unit is set-up. The role of the parents should not be forgotten, in terms of

emotional and social support and the teaching role that they need to assume.

Thomson (1990) put forth another point of discussion about the best way to group for teaching dyslexics. The arguement was that the one to one method is the best. But they had also found that small groups provide a useful source of enjoyment and inte action. Also it allows for some gentle competition later on as the children become more proficient and enjoy spreading their wings.

Thomson (1990) compiled research done over the years and show that dyslexics do improve with:

* small group teaching
* early identification and help
* understanding and encouragement
* multisensory techniques - tracing, sound-symbol associations and simultaneous oral spelling
* a structured approach based on established phonetic principles
* matching task to learner i.e. individualising instruction based on careful assessment.
* teaching to strengths and remediating weakness where appropriate

* mnemonics and 'concrete' aids
* constructive, supporting, exerting classroom experiences.

Dyslexics do not improve with :

* unspecific remedial methods i.e. more reading, spelling
* extra attention and psychotherapy alone
* being left to grow out of it
* tracing visual or auditory perception alone
* patterning or other neurological exercises to develop laterality
* punishments or threats
* inappropriate labelling e.g. "think", stupid, lazy, maladjusted etc.

Keeping inview the individual error patterns and areas of difficulties the goals and activities were moulded accordingly. Auditory-visual channel activities encompassed areas of discrimination, sequence, memory, identification of vowels perception of rhyme, word families, sound-symbol correspondence analysis and synthesis of sounds and syllabification. Except ng for discrimination, sequence and memory the remaining subgoals did prove a challenging task for all the 3 children. The goal of specific spelling rules and cues needed constant revision. Rote learning was not encouraged. A particular rule when introduced would be

accompanied by a large number of examples. The children would be asked to recollect words read or seen earlier. Not more than one rule was introduced per week, activities involving visuo-motor perceptual tasks were received better especially since they did not involve much written wotk. As compared to the normative data Case B and C performed at a relatively lower level in tasks of reading, oral and written expression.

Table 2

	Pre therapy	Post therapy	Difference	Pre therapy	Post therapy	Difference	Pre therapy	Post therapy	Difference
Alphabet Identification	26/26	26/26	-	26/26	26/26	-	26/26	26/26	-
	26/26	26/26	-	26/26	26/26	-	24/26	26/26	-
Alphabet Recall	26/26	26/26	-	26/26	26/26	-	26/26	26/26	-
	26/26	26/26	-	25/26	26/26	-	26/26	26/26	-
Visual Discrimination	15/16	16/16	-	16/16	16/16	-	15/16	16/16	+2
	15/17	15/17	-	17/17	15/17	-	11/17	15/17	+5
Auditory Discrimination	30/30	30/30	-	30/30	30/30		30/30	30/30	0
Phoneme Grapheme Correspondence Part 1									
A	23/30	30/30	+5	15/30	30/30	+6	29/30	30/30	+3
B	15/30	28/30	+4	14/30	30/30	+7	25/30	30/30	+6
Part 2									
A	12/18	18/18	+6	18/18	17/18	0	16/18	17/18	+4
B	3/15	13/15	+3	13/15	15/15	+3	13/15	12/15	-3
C	Unable to do	19/20	+3	19/20	20/20	+3	20/20	19/20	-2
Structural Analysis	1/10	9/10	+5	1/10	9/10	+7	4/10	9/10	+5

The post therapeutic assessment reveals that the three children have shown significant improvement, but there is a difference in the amount of improvement. Though the therapy programme lasted for a period of six months not all the cases attended therapy regularly Case A and B were more a regular and punctual and had the added advantage of a supportive family. Case C was very irregular in attending therapy, and attended only about 50% of the sessions. Moreover the home tasks given were not carried out and neither the child nor the parents showed keen interest in the remedial programme. A great deal of counselling had to be given both to the parents as well as the child.

Table 3

	Case A			Case B			Case C		
	Post therapy	Normative Data	Difference	Post therapy	Normative Data	Difference	Post therapy	Normative Data	Difference
Alphabet Identification	26/26	STD IV	+2	26/26	STD VII	Age app.	26/26	STD VI	Age App.
	26/26	STD V	+2	26/26	STD VII	"	26/26	STD VI	"
Alphabet Recall	26/26	STD V	+3	26/26	STD VII	"	26/26	STD VI	"
	26/26	STD VIII	+6	26/26	STD VIII	+3	26/26	STD VII	+2
Visual Discrimination	16/16	STD IV	+2	16/16	STD VII	Age App	16/16	STD VI	Age App.
	15/17	STD VI	+4	15/17	STD VI	- 1	15/17	STD VI	
Auditory Discrimination	30/30	STD VII	+5	30/30	STD VII	Age App.	30/30	STD VI	Age App.
Phoneme Grapheme Correspondence Part 1									
A	30/30	STD VI	+4	30/30	STD VII	Age App.	30/30	STD VI	Age app.
B	28/30	STD V	+3	30/30	STD VIII	+1	30/30	STD VIII	+2
Part 2									
A	18/18	STD VIII	+6	17/18	STD VIII	+1	17/18	STD VIII	+2
B	13/15	STD IV	+2	15/15	STD VIII	+1	12/15	STD II	-4
C	19/20	STD IV	+2	20/20	STD VII	?	19/20	STD IV	-2
Structural Analysis	9/10	STD VIII	+6	9/10	STD VIII	+1	9/10	STD VIII	+2

Post Therapeutic assessment reveals the following scores.

Case A : Age 7 years / M Mother tongue : English

	Alphabet identification		Alphabet recall		Visual discrimination		Auditory discrimination
Scores	26/26	24/26	26/26	26/26	16/16	15/17	30/30
Age level Functioning at (based on normative data	STD IV	STD V	STD V Above average	STD VIII	STD IV	STD V-VI	STD VII

	Phoneme-Grapheme Correspondence Part I		Phoneme-grapheme Correspondence Part II			Structural Analysis
	A	B	A	B	C	
Scores	30/30	20/30	18/18	13/15	19/20	9/10
Age level functioning at (based on normative data)	STD VI	STD V	STD Average	STD IV	STD IV	STD V Above averag

Reading: Takes time to read-reads at a slow pace but makes few guesses. Reading comprhension has improved. Does not skip lines. Approach to read has

improved looks atlthe word, analyses then reads. But still reads through punctuation, narration ability is good.

Writing: Can write in simple sentences. No omissions, substitutions seen, no reversals present. Occasionally tends to mix small and capital letters.

In the task of visual discrimination the child showed confusion of letters b-d and wrong sequencing of letters. Inthe phoneme-grapheme correspondence section child displayed difficulty with blends. he could do one sub-section of the structural analysis section which required him to complete the sentence with the correct missing word The latter sections consisted of complex plurals, part tenses and affixes, he was unable to do them, this could be attributed to the level of difficulty of the test items. Reading is more fluent, he is able to answer factual questions based on the material read, can find the main idea in the passage, follow sequence of events in a story. he can narrate a story verbatim when once narrated to him i.e.he does not miss out any minor details, and maintains the sequence of events and the continuity. Writing - writes in simple, coherent, complete sentences. Mixes capictal and

small letters, needs to be reminded about the usage of capital letters. Does not use punctuation except for all stop. Spelling-is able to spell correctly a wide range of common words, recognises that spelling has patterns and applies this knowledge in attempting to spell more words, there is an increased awareness of word famlies. Uses techniques such as syllabification, analysis and synthesis of sounds in spelling tasks. Oral language is good attributed to the fact that English is the mother tongue. Visuomotor perceptual aspects - right left confusion persists, complex 3 stage sequential commands need to be repeated. Class teachers observation- noticeable improvement an terms of marks, handwriting and his approach to new concepts. He is more flexible and writing to try new tasks. requires repeated insttuction, is often silent and moody. Is less scored and interacts well with peer males.

Case B : Age 12 years / MF Mother tongue : Kannada

	Alphabet identifi-cation		Alphabet recall		Visual discri-mination		Auditory discri-mination
Scores	26/26	26/26	26/26	26/26	16/16	15/17	30/30
Age level Function-ing at (based on normative data	STD VII	STD VII	STD VII	STD VII	STD VI-VII	STD V-VI	STD VII

	Phoneme-Grapheme Correspondence Part I		Phoneme-grapheme Correspondence Part II			Structural Analysis
	A	B	A	B	C	
Scores	30/30	30/30	17/18	15/15	29/20	9/10
Age level functioning at (based on normative data)	STD VII	STD VIII	STD VIII	STD VIII	STD VIII	STD VIII

Reading: Reading comprehension has improved. Is aware of punctuation marks. When faced with a difficult word she attacks it syllable by syllable.

Writing: Spells phonetically, confusion of vowels present e.g. the vwel /e/ by /E/. Faces difficulty with tense markers, is unsure of usage of appropriate past, present, future tense. Sentence content and structure have improved considerably.

In the visual discrimination she faced a problem with incorrect sequencing of correct letters and hence scored less. Remarkable improvement seen in phoneme-grapheme correspondence tasks and initial level of structural

analysis (which deals with completing the sentence with the appropriate word). She faces problems with tense markers and location of root words. In the reading task it was observed that the child uses syllabification and decoding skills to tackle new words. Is fluent while reading, finds the main idea in the story, is able to answer factual questions, follows the sequence of events but is unable to reproduce the entire material on reading it just once. Spontaneous writing needs to be worked upon intensively. Errors are present in the form of incorrect usage of tenses, pronoun confusion. In spelling tasks uses more of an auditory approach and syllabification approach to tackle new words she does incorporate and implement the new strategies taught to spell irregular words. Oral language-is not very comfortably conversing in English, uses extremely simple sentences. Here again errors in terms of usage of appropriate tense marks seen. Story narration ability is in the concrete - descriptive stage.

Class Teacher's observation - Child shows more self confidence, is bolder in class and is interested inclass. Is bolder in her interaction with peers. Fear towards examinations persists. In terms of marks - slight improvement seen Oral responses are slow and poor as compared to other children.

Case C : Age 13 years / M Mother tongue : Kannada

	Alphabet identification		Alphabet recall		Visual discrimination		Auditory discrimination
Scores	26/26	26/26	26/26	26/26	16/16	15/17	30/30
Age level Functioning at (based on normative data	STD VII	STD VII	STD VII	STD VIII	STD VI-VII	STD V-VI	STD VII

	Phoneme-Grapheme Correspondence Part I		Phoneme-grapheme Correspondence Part II			Structural Analysis
	A	B	A	B	C	
Scores	30/30	20/30	17/18	12/15	19/20	9/10
Age level functioning at (based on normative data)	STD VI	STD VII	STD VII above average	STD III IV	STD IV	STD V

Reading: Does not skip lines, makes fewer guesses, considerable approach seen in terms of comprehension and approach to reading. Is more aware of punctuation marks.

Writing: Spontaneous writing-poor performance copying ability is fair. In spontaneous writing omission of lettes present, additions also present. Poor syntactical sentence structure, continues to regularise irregular words, inappropriate usage of tense markers.

Due to irregular attendence at the therapy sessions progress is limited to Part I of phoneme grapheme correspondence section. In visual discrimination tasks he showed confusion in correct sequencing of letters. In reading taks - comprehension has improved, is able to follow written directions, find main ideas in a passage answer question based on material issued, is able to follow sequence f events in the story but faces difficultly in forming outline of the content or form judgement on what has been read. Writing - spontaneous writing is poor. The idea is present but due to inadequate poor vocabulary skills he is unable to form appropriate sentences. Faces difficulty with tense markers. In spelling skills. There is no carryover from written work in therapy sessions to spontaneous writing. Relies more on a visual approach to tackle a new word. Oral language needs to be worked upon. Sentences are simple, he is hesitant to initiate or continue a conversation in English.

Writing: Spontaneous writing-poor performance copying ability is fair. In spontaneous writing omission of lettes present, additions also present. Poor syntactical sentence structure, continues to regularise irregular words, inappropriate usage of tense markers.

Due to irregular attendence at the therapy sessions progress is limited to Part I of phoneme grapheme correspondence section. In visual discrimination tasks he showed confusion in correct sequencing of letters. In reading taks - comprehension has improved, is able to follow written directions, find main ideas in a passage answer question based on material issued, is able to follow sequence f events in the story but faces difficultly in forming outline of the content or form judgement on what has been read. Writing - spontaneous writing is poor. The idea is present but due to inadequate poor vocabulary skills he is unable to form appropriate sentences. Faces difficulty with tense markers. In spelling skills. There is no carryover from written work in therapy sessions to spontaneous writing. Relies more on a visual approach to tackle a new word. Oral language needs to be worked upon. Sentences are simple, he is hesitant to initiate or continue a conversation in English.

Class Teachers's observation - Child is silent, less responsive both in oral and written work. no noticeable improvement seen in school work, in terms of marks. Thus analysis of "carry over" to school work shows that it is least in this case perhaps due to inadequate family support and irregularity in therapy.

Case B and C showed marked improvement in tasks involving phoneme-grapheme correspondence, sequencing, memory, discrimination but failed to show a parallel improvement in areas concerning use of English in oral and written aspects. Better application of spelling strategies seen in Case A and Case B. Case A faired well on language aspects (oral and written but requires a firm grounding in sequencing and sound symbol correspondence tasks. Thus all the 3 subjects bene fitted from an approach that emphasizes on integration of the multisensory (V A K T modalities visuomotor perceptual aspects and oral/written language aspects).

Hence a remedial programme for dyslexic children needs to encompass a vast area, utilizing all modalities - using the strong modalities to the greatest extent and strengthening the weaker modalities. The current study set

out to evaluate the efficacy of a remedial programme in English based on the Aston Teaching Programme. All the three subjects did show progress but there remained individual variability which could be attributed to various factors such as regularity in therapy English as the mother tongue and role of a supportive family.

SUMMARY

The problem of developmental dyslexia has become a matter of increasing public attention and a major cause of worry for the concerned parents. The child's inability to read and write as expected of him and his continuing downhill performance in academic areas prove to be major obstacles in his school learning and this problem has its own determinental influences on the child's personal and social life.

The history of remediation of reading disability reveals that remedial aspects took a turn from traditional methods that utilised neuropsychologically based principles and non verbal techniques to more modality specific techniques and other techniques that emphasized phonics instructional methods.

Since a vast number of children in India attend English medium schools but come from non-English backgrounds remediation of reading disbility in India poses a different kind of challenge.

The present study was undertaken to evaluate the efficacy of a remedial programme in English in a small group of dyslexic children, based on the Aston Teaching Programme. A few modifications were incorporated such that the remedial programme encompassed the areas of -

a) Auditory visual channel deficits

b) Specific spelling rules and cues

c) Visuomotor perceptual aspects

d) Reading, oral and written expression of language.

Three subjects were chosen who were provisionally diagnosed as developmental dyslexia. A pre-therapy evaluation was carried out using the test of Early Reading Skills proposed by Rae and Potter (1973). Therapy was given for a period of six months following which a past therapeutic assessment was carried.

It has been observed that the three children have shown significant improvement but individual variations exist. The progress varies ineach child. The influence of factors such as English speaking background at home, the influence and help of a supportive family, punctuality and regularity of the children attending therapy. Possibly accounts for the individual differences in terms of improvement post therapeutically.

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