

ORIGINAL ARTICLES

THE DIAGNOSTIC TEST OF READING DISORDERS (DTRD)

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ABSTRACT

The Diagnostic Test of Reading Disorders (DTRD) has been designed to identify deficits in the sub-processes leading to a reading failure in children. The sub-processes identified in the DTRD, cover areas in phonemic skills and linguistic skills, through its eight items. The DTRD is clinical - prescriptive in nature, whereby the child's performance in the test forms a base for intervention.

The DTRD has been standardised based upon on a sample of 1100 children, between the ages of 8-11 yrs. The mean age of the subjects was 9 yrs. and 2 months. The data was collected from English Medium schools in Mumbai, as well as the Assessment Unit of the Centre of Special Education, SNDT Women's University, Mumbai. The reliability and the validity of the test, has been determined using appropriate statistical techniques.

INTRODUCTION

For every child, reading has many connotations. It is the key to success in school, in the development of interests outside school, to the enjoyment of leisure time, and to personal and social adjustment. It helps the child in adjusting to others in the same age group, to become independent of parents and teachers, to select and prepare for an occupation and to achieve social responsibilities (1). Aldous Huxley pointed out 'every man who knows how to read has it in his power to magnify himself, to multiply the ways in which he exists, to make his life full, significant and interesting'. In the modern school, effective reading is the most important avenue to effective learning. Difficulty with reading is, by far, the most common characteristic of a student with learning disabilities. It is estimated that 90% of all children identified as learning disabled, are referred for special education services because of reading problems (2).

THE READING PROCESS

"Reading can be compared to the performance of a symphony orchestra" (3). Reading is a holistic act. Even though reading is sometimes characterised by specific skills such as discriminating letters, identifying words, and understanding specific vocabulary; performing

the sub-skills one at a time, does not constitute reading. Reading can take place only as an integrated performance. Therefore, deficits in any of these sub-skills will affect the reading efficiency.

Reading is meaning-based. It entails the active construction of meanings, and requires the reader to be strategic, and interact with the text. Reading is a language learning that is socially mediated.

In order to read, a person must acquire a number of basic perceptual linguistic skills.

- The ability to focus attention, to concentrate and follow directions
- The ability to understand and interpret spoken language in daily life
- Auditory memory and sequencing
- Visual memory and sequencing
- Decoding and word attack
- Structural-contextual analysis of language
- Logical synthesis and interpretation of language
- Vocabulary development and expansion
- Fluency in scanning and referencing

Children with LD experience serious difficulties with learning even in basic skills such as reading, writing and doing math, despite having normal intelligence.

They also manifest problems in listening, reasoning, perception, memory, selecting, and focusing attention on relevant information. These perceptual and cognitive deficits, assumed to be the underlying causes for reading and writing problems, have provided the basis for the development of the Diagnostic Test of Reading Disorders (DTRD). Children experiencing reading difficulties consistently are said to have dyslexia and no, one causal factor seems to explain all cases of dyslexia. Therefore it is imperative to diagnose the cause of the reading disorder for which the Diagnostic Test of Reading Disorder has been developed. This Diagnostic test uses a "Clinical Inferential" approach against the 'statistical approach', in the diagnosis of a dyslexic. The general cognitive hypothesis of both the approaches, hold that distinct patterns of reading and spelling reflect the weakness and strengths of broadly defined cognitive processes, auditory and visual perception and memory in particular. In a language class, initially the child "learns to read", then "reads to learn". Children having deficits in the learning process will find difficulty in "reading to learn" and comprehend text.

Recent research suggests that children with severe reading disabilities, particularly those who are resistant to intervention effective for the majority of struggling readers, may also have process deficits, besides the deficits in phonological awareness (4).

THE RATIONALE FOR DTRD

In the DTRD, the authors have focused on those processes which will assess the child (from 8-11 years) for fluency and accuracy, the two major aspects of reading. The test identifies and diagnoses the process deficits that cause disorders in both fluency and accuracy.

The DTRD aims at measuring the following process through its eight items.

ITEMS

Level-1

- I) Sound-symbol Association (SSA)
- II) Blending of Sounds.(BS)
- III) Phonic Analysis (PA)
- IV) Visual Conditioning (VC)
- V) Semantic Closure (SC)
- VI) Lexical Processing (LP)
- VII) Language Internalization (LI)
- VIII) Copy Writing (CW)

Level-II

- I) Grapheme Phoneme Association (GPA)
- II) Verbal Phonetic coding (VPC).
- III) Phonemic Synthesis (PS).
- IV) Verbal Visual Correspondence (VVC).
- V) Verbal Memory (VM).
- VI) Listening Comprehension (LC).

VII) Reading Comprehension-ALoud (RCA).

VIII) Reading Comprehension Silent (RCS).

STANDARDISATION OF THE TEST

Sample

DTRD Level-I and Level-II was standardised on a sample of 1100 school-going boys and girls in the age range of 8-11 years. The mean age was 9 years and 2 months. The data was collected from schools in Mumbai and the Assessment Unit of the Centre of Special Education of SNDT Women's University, where children coming from various parts of India are assessed for reading problems, besides other learning problems.

For Pilot testing, an equivalent sample of 278 (boys and girls) was selected from 4 schools in Mumbai, which are not included in the final sample.

Procedure

a) Item : Preparation and Selection

All the sub-processes required for proficient reading were identified and the items were prepared to measure each of the sub-processes. In the first draft of the test, the number of sub-items was double the number of sub-items in the final test. This was done to avoid repeating preliminary data collection for selection of the items. After preparation of the final test, it was given to 10 experts working in the field, to judge from appropriateness of the content of the items to the sub-processes to be measured. On the basis of their comments, the items were modified and deleted when necessary, from the test. The second draft of the test was administered on a smaller sample of 20 children, in the age range of 8-11 years.

On the basis of observation of the children's task behaviour, the items and instructions were further modified.

The selected items were subjected to Pilot Testing:

b) Item : Try-out/ Pilot Testing

After item selection the second draft of the test was used for pilot testing. 278 boys and girls in the age range of 8-11 years from standard III and IV were selected for pilot testing. A close observation was made with regard to the children's understanding of the instruction task etc. All kinds of ambiguity were recorded and later removed from the items. Items which did not seem to discriminate between the good and the poor performers and ambiguous items, were deleted after the pilot testing.

c) Final Testing

After pilot testing and modification of the second draft, a final draft of the test was administered on the combined sample of 1100 boys and girls. The data thus collected on the sample, was used for determining reliability and validity of the test.

d) Reliability of DTRD

The Reliability coefficient was computed using the Test-Retest Reliability method. The test was administrated twice with a time gap of 20 days. The reliability coefficient for each time was computed by correlating the scores obtained by the students, on the two administrations. The reliability co-efficient and reliability index for the test (Level-I and Level-II) are presented in the following table.

Reliability Co-efficient of DTRD

Level-I

Table 1.

Item	I	II	III	IV	V	VI	VII	VIII	Total
Sub-Areas	SSA	BS	PA	VC	SC	LP	LI	CW	N=550
Test-Retest Reliability Co-efficient	.68	.76	.81	.61	.72	.61	.58	.62	.71
Reliability Index	.81	.86	.84	.77	.89	.75	.83	.76	.81

Level-II

Table 2.

Item	I	II	III	IV	V	VI	VII	VIII	Total
Sub-Areas	GPA	VPC	PS	VVC	VM	LC	RC(A)	RC(S)	N=550
Test-Retest Reliability Co-efficient	.78	.62	.68	.72	.71	.73	.64	.70	.70
Reliability Index	.71	.89	.73	.84	.88	.75	.88	.79	.78

e) Validity of DTRD

The validity of the test items was established by applying the procedures of item analysis. Item analysis determined the discriminatory power of each item with regard to delineation of students with, and without reading disorder.

f) Item Analysis

Item analysis was done to find out the internal consistency of the test, which would lead to the diagnosis of the reading disorders. Biserial co-efficient of correlation were calculated between the top 27% and the bottom 27% of the scores on each item. The difficulty index was calculated by averaging the percentage of the two extreme groups. The validity index and the difficulty index for each item were calculated. The rbis ranged from .20 to .57 for Level-I and .21 to .36 Level-II. The difficulty index ranged from .48 to .64 for Level-I and .55 to .70 for Level-II.

Cross validation of the items was done on another parallel sample of children with reading problems Level-I (N=146) and Level-II (N=126).

The biserial co-efficient of correlation thus obtained ranged from .24 to .53 for Level-I and .19 to .46 for Level-II.

Table 3.

Difficulty - Index (DI) and Validity - Index (VI) of the test items of DTRD :

Level-I

Item No.	Sub-Test	DI	VI
1	SSA	.82	.20
2	BS	.56	.37
3	PA	.58	.42
4	VC	.48	.20
5	SC	.64	.57
6	LP	.50	.33
7	LI	.52	.20
8	CW	.58	.25

Level-II

Item No.	Sub-Test	DI	VI
1	GPA	.55	.21
2	VPC	.68	.23
3	PS	.70	.36
4	VVC	.63	.22
5	VM	.68	.23
6	LC	.55	.25
7	RC(A)	.58	.33
8	RC(S)	.64	.21

Items having validity index below .20 were not included in the test.

g) Quality - Control Procedure

To eliminate the effects of the tester's bias, the authors of the DTRD personally administered the test on the children, scored and analysed the data. To maintain consistency in administration, the instructions were read out from the booklet to the subjects. Care was taken to make the subjects feel comfortable before and during the testing.

DISCUSSION

Scot and Clinton (5) state that reading is a "psycho-linguistic" process. According to them, the reader relies on three types of information to read adequately - a) the graphic information b) the semantic information and c) syntactic information. The authors of DTRD through its eight items (Level I and Level II) have sought to assess the child in each of these types of information.

Phonemic awareness is believed to be critical to any success in reading. It has been observed that most children diagnosed as dyslexics have performed poorly on items measuring the phonemic process. The ability to segment and synthesise sounds, are tested through items on phonemic awareness. A lack of familiarity with the sounds of the language and the way they are represented in its alphabetic code, cause children to fail in developing any reading skills and create severe problems in learning how to spell as well. This explains, why a lot of these children were unable to reads words like "baby" or "nation" or even non words like "sool" or "jugar".

Reading is a skill superimposed on a well developed language (6), and so, a sound language base is imperative for adequate reading. This is because reading is not just the deciphering of the sound symbols, but is meaning based too. It is language proficiency that makes possible

the comprehension of matter that is read. A child must somehow assimilate the complex rules governing the language system embodying the underlying linguistic structures for assessing meaning from print. This is why a subgroup of poor readers were unable to read or comprehend sentences like, "Tie your tie and untie it again" and "Prakash puts pen and pencil in his pocket". Poor performance was also observed in the test of Language Internalization (Level 1, No. VII). Many felt that the sentences needed no blanks to be filled, and when filled, it was generally incorrect.

The authors of the DTRD have identified two sub groups emerging amongst the Dyslexics. One with adequate oral language skills, where reading failure has been attributed to purely perceptual process, and where children perform reasonably well on tasks involving listening comprehension. The other sub group exhibited deficiencies in both, the perceptual process, as well as the process involving the development of language skills. Poor language skills interfere with comprehension, for they fail to provide the necessary background, so necessary for adequate comprehension (7). Children, especially in cities in India, learn through English which is the medium of instruction, and most often this is not the child's mother tongue. Bilingualism, another characteristics feature of the Indian educational system, also aggravates the problems for dyslexics in India. A sub group of dyslexics in the country, are faced with a dual problem - one dealing with perceptual problem and the other dealing with the language aspect. Because of Bilingualism the problems in semantics, syntax, monophology and pragmatics, all get doubly complex. (8). This test has been standardised on the bilingual population of children.

CONCLUSION

The DTRD aims at pin pointing the deficient areas responsible for the child's reading failure. The analysis of the child's performance on the DTRD would result in forming the base for effective remediation. It has been the observation of the authors of the DTRD, that 80% of children with Dyslexia need remediation in both perceptual as well as language areas.

A highly motivating environment with enriched language and structured reading programmes would serve to remediate, circumvent problems in reading for the dyslexics and even prevent a reading failure in one "at risk", if early and intensive remediation is resorted to.

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The Spastics Society of India's National Resource Centre for Inclusion and the Centre for International Child Health, London offer a 12 week certificate course entitled "Community Initiatives in Inclusive Education" (CIIE) for master trainers and planners of community services in the Asia Pacific Region. The course commencing on the 9th of February 2004 is supported by the Women's Council, UK who are willing to fund the tuition and stay of deserving women candidates. Interested individuals as well as organization who wish to propose a woman candidate may contact Dr. Sharmila Donde, Coordinator CIIE at sharmiladonde@hotmail.com.