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THE OLYMPICS OF DYSLEXIA

5th WORLD CONGRESS on DYSLEXIA

23-27 AUGUST 2004

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This program exists thanks to the dedicated work by many colleagues and students. I wish to personally thank each one of the following:

SECRETARIAT: VASILOU, G.

KOTSAILIDOU, K.

LAMPROPOULOU, S.

PETROU, A.

PAVLIDIS, A.

TAKIDOU, M.

the writing of children with writing disabilities at the elementary level of schooling will prevent stagnation and school dropouts.

The focus of this study are children identified as children with reading and writing disabilities studying in grades IV, V and VI of thirteen English medium schools whose performance on specific tasks involving the writing of reports and stories were compared with those of their normally achieving peers.

The types of errors committed by children with writing disabilities as well as the strengths and weaknesses discernable in their writing were used as a basis for a remedial program which focused on improving handwriting, spelling and written expression. In this study it was found that an improvement in the skills associated with writing was accompanied by an increase in word recognition skills as well.

ANALYSIS OF THE DIFFICULTIES AND ERRORS IN NUMBER CONCEPT AMONG CHILDREN WITH DYSCALCULIA, NORMAL ACHIEVERS AND CHILDREN WITH VISUAL IMPAIRMENT

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Objectives : Comparison of different grades and groups of dyscalclics, normal achievers and visually impaired with reference to difficulties and errors in number concept.

Sample : The children came from normal schools, special education centre and special school.

They attended from grades II, III and IV from normal primary schools. Grade VIII students were referred from a normal school to a special education centre. · The CWD were grouped into those without reading and writing disorders, with writing disorders and with both reading and writing disorders. The sample also consisted of normal

achievers selected from the same schools. The VIII grade students who were undergoing full time remedial instruction in a special education centre were also the subjects of the study. Children with visual impairment (N = 34) were selected from special schools.

Method : An Arithmetic Diagnostic Test was administered to all the subjects of the different studies. The items included under number concept are – counting the dots, writing the numbers in words, writing the number words in digits, writing the numbers in correct sequence, writing the numbers which are lesser and greater than a given number as well as arranging the set of numbers in ascending order.

Analysis : Qualitative analysis was made with reference to the difficulties experienced and errors committed by different types of subjects. Some of the differences between pre and post training were statistically significant ($P<0,01$)

Major Findings and Implications : The findings suggest that the difficulties of dyscalculics in number concept persist for longer duration, if intervention is not provided. Remedial instruction should be tailor made. Visual Impairment may not affect development of number concept.

DEVELOPMENTAL DYSLEXIA IN POLISH ADULTS: THEORETICAL IMPLICATIONS

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Our study addresses two issues: the cognitive profiles of developmental dyslexics, and cross-linguistic differences in these profiles.

ANALYSIS OF THE DIFFICULTIES AND ERRORS IN NUMBER CONCEPT AMONG CHILDREN WITH DYSCALCULIA, NORMAL ACHIEVERS AND CHILDREN WITH VISUAL IMPAIRMENT

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Paper Presented in the 5th World Congress
On Dyslexia, Macedonia, Greece

2004

ANALYSIS OF THE DIFFICULTIES AND ERRORS IN NUMBER CONCEPT AMONG CHILDREN WITH DYSCALCULIA, NORMAL ACHIEVERS AND CHILDREN WITH VISUAL IMPAIRMENT

RAMAA S and GOWRAMMA, I.P. INDIA

ABSTRACT

Purpose : The purpose of the paper is to give data obtained from four independent studies regarding difficulties experienced and errors committed in number concept among Dyscalculics, normal achievers and children with visual impairment.

Objectives : Comparison of different grades and groups of dyscalclics, normal achievers and visually impaired with reference to difficulties and errors in number concept.

Sample : The subjects were identified from normal schools, special education centre and special school.

Method : An Arithmetic Diagnostic Test was administered to all the subjects of the different studies. The items included under number concept are – counting the dots, writing the numbers in words, writing the number words in digits, writing the numbers in correct sequence, writing the numbers which are lesser and greater than a given number as well as arranging the set of numbers in ascending order.

Analysis : Qualitative analysis was made with reference to the difficulties experienced and errors committed by different types of subjects. The data is tabulated and inferences are drawn.

Major Findings and Implications : The findings of the study suggest that the difficulties of dyscalculics in number concept persist for longer duration, if intervention is not provided. Remedial instruction should be tailor made. Visual Impairment may not affect development of number concept.

ANALYSIS OF THE DIFFICULTIES AND ERRORS IN NUMBER CONCEPT AMONG CHILDREN WITH DYSCALCULIA, NORMAL CHILDREN AND ACHIEVERS WITH VISUAL IMPAIRMENT

Purpose

The purpose of the paper is to give data obtained from four independent studies conducted with dyscalculics (Ramaa, 1990), dyscalculics and normal achievers (Gowramma, 1999), children with visual impairment (Shobha, 1995), students of VIII grade with learning disabilities (Ramaa and Gowramma, 1997). The intention was to analyse the difficulties demonstrated and errors committed by the subjects of the above studies in Number Concept.

Objectives

1. To compare the number of children with dyscalculia of Grades II, III and IV who failed to master different components of Number Concept without remedial instruction.
2. To compare different groups of dyscalculics and normal achievers in the types of errors committed in Number Concept before remedial instruction.
3. To compare the performance of children with dyscalculia in Number concept before and after remedial instruction.
4. To find out whether students with learning disorders of grade VIII referred for Special Education Centre still experience difficulty in number concept prior to remedial instruction.
5. To compare the performance of children with Visual Impairment in Number Concept among grades II, III and IV who are studying in special schools.

Sample

To achieve the above objectives children were identified from grades II, III and IV from normal primary schools. Grade VIII students were referred from a normal school to a special education centre. The CWD were grouped into those without reading and writing disorders, with writing disordersand with both reading and writing disorders. The sample also consisted of normal achievers selected from the same schools. The VIII grade students who were undergoing full time remedial instruction in a special education centre were also the subjects of the study. Children with visual impairment (N = 34) were selected from special schools.

Method

An Arithmetic Diagnostic Test (Ramaa, 1990 and 1993) developed for primary school children was administered to all the subjects of the study. For visual impaired children suitable transcription to Braille was done by the investigator. Qualitative analysis of the errors committed by the subjects in all the subcomponents of the test – Number Concept, addition, subtraction, multiplication and division were done. However in the present paper, the focus is on the difficulties experienced and errors committed by different groups in number concept only.

The items included under number concept are counting the dots, writing the numbers in words, writing the number words in digits, writing the number in correct sequence, writing the numbers which are lesser or greater than a given number as well as arranging the set of numbers in ascending order.

Analysis

The number of children who faced difficulties in different components of number concepts were identified. Error analysis was also attempted. The tables given below provide the details of the variables and results. They are self explanatory.

Table 1 : Presence or Absence of Mastery in Basic Understandings and Specific Skills relating to Number Concept among Dyscalculics of Grades II and III without remedial instruction

Sl. No. of the classes	Grade	Count-ing	Knowledge of reading integers upto 3 digit Nos.	Writing integers (upto 3 digit Nos)	Sequential repro-duction of Nos. upto 3 digit nos.	Concept of lesser than and greater than	Seria-ting Nos. in ascend-ing order
1.	II Std.	1	1	×	1	1	NA
2.	II Std.	1	1	×	×	1	NA
3.	II Std.	1	1	×	1	1	NA
4.	III Std.	1	1	×	×	1	×
5.	III Std.	1	×	1	×	1	1

NA – Not Applicable

Table 2 : Presence or Absence of Mastery in Basic Understanding and Skills relating to Number Concept among Dyscalculics of Grade IV without remedial instruction

Sl. No. of the classes	Count-ing	Knowledge of Nos. & Place Value					
		Reading integers upto 4 digits	Fractions limited to ¼, ½, ¾ and mixed Nos. involving these fractions	Writing integers	Sequential reproduction of numbers upto 4 digit numbers	Concept of lesser than and greater than	Seriating the numbers in ascending order
1.		×	×	×	×		×
2.			×	×	×		×
3.		×	×	×	×		×
4.		×	×	×	×		×
5.		×	×	×	×		×
6.		×	×				×
7.							×
8.							×
9.							×
10.		×					×

Table 3 : Comparison of different groups of dyscalculics and normal children studying in normal schools of Grades III and IV in the types of errors without remedial intervention

Sl. No.	Types of Errors	Example	Probable Reason	% of children committed the errors			
				A	B	C	D
1.	Reversal of digits	6 as 9; 7 as Γ	Poor visual discrimination and spatial awareness	4.16	7.14	7.5	0
2.	Reading digitwise	314 as three, one, four	Poor memory, concept of place value	8.33	21.4	17.5	0
3.	Splitting the numbers while Reading/ writing	370 as 3 & 70	-do-	25	21.4	42.5	0
4.	Repeating of the numbers in the Sequence	6,7,--,-- as 6,7, 6,7	Difficulty in recalling the sequence, or lack of understanding of the problem	12.5	35.6	35.0	0
5.	Reversal of numbers	07 as 70 14 as 41	Lack of spatial temporal correspondence or impulsivity	33.33	42.85	30.0	0

Sl. No.	Types of Errors	Example	Probable Reason	% of children committed the errors			
				A	B	C	D
6.	Substitution of digit	370 as 170	Three digits are considered as "hundred" always	12.5	14.2	100	0
7.	Writing the number as it is said	106 as 1006	Lack of place value concept	50	35	30	3.4
8.	Omits a digit	214 as 21	Poor place value concept	12.5	14.28	10.0	0

A → Children with dyscalculia only.
B → Children with dyscalculia and writing disorders
C → Children with dyscalculia, dyslexia and writing disorders
D → Normal achievers

Table 4 : Mean Performance on Pretest and Posttest in Number Concept of children with Dyscalculia only

Tests	N	Maximum score	Mean	SD	t-ratio
Pre-test	8	42	15.12	3.22	21.01*
Post-test	8	42	41.00	1.30	

* t-value significant at 0.01 level

Table 5 : Marks obtained by the grade VIII subjects in number concept (N = 3) before Remedial Instruction – in a Special Education Centre

Max. Marks	Case 1	Case 2	Case 3
48	42	37	40

Subjects of grade VIII committed the following errors in number concept. Substitution of digits while writing, omitting a digit, changing the place of a digit, confusing between increasing and decreasing order.

Table 6 : Mean score obtained by children with Visual Impairment in Number concept with Special Instruction

Max. Marks	N	Maximum Score	Mean
Grade II	8	42	40.2
Grade III	7	42	40.25
Grade IV	6	42	42

Major Findings and Implications

Findings of the studies confirm the earlier inferences that there is considerable heterogeneity among CWD of same grades, with reference to the difficulties in learning number concept without intervention.

The difficulties may persist for longer duration. Remedial instruction should be tailor made, suiting to the special needs of each child with Dyscalculia. Visual Impairment may not affect development of number concept when taught through systematic methods in a special school. This is a strong supporter for one of the exclusionary criteria for identification of learning disabilities – free from visual impairment.

STRATEGIES TO DEVELOP CONCEPT AND PROCEDURE OF DIVISION IN CHILDREN WITH DYSCALCULIA

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Paper Presented in the 5th World Congress
On Dyslexia, Macedonia, Greece

2004

STRATEGIES TO DEVELOP CONCEPT AND PROCEDURE OF DIVISION IN CHILDREN WITH DYSCALCULIA

ABSTRACT

Purpose : The purpose of the study was to identify, diagnose the errors and develop instructional material for dyscalculics in number concept, addition, subtraction, multiplication and division. In this paper details regarding planning and experimentation of the remedial instruction program for development of concept and procedure of division among dyscalculics are given.

Objectives : The objectives were to develop concept and skills of division in different steps like division involving just one step, long division and simple problem solving, which involved planning and experimental validation.

Sample : For the purpose of experimentation, 8 dyscalculics without any other learning disorders were chosen from the point of view of feasibility.

Method : The study was conducted in two phases. Planning and Experimental Validation :

Planning the remedial program – Based on the difficulties experienced by dyscalculics in arithmetic in general and division in particular, a remedial program was planned. While planning the program, general principles of teaching arithmetic and specific principles of teaching division were incorporated.

In the summary, the main features and special features of the remedial program are discussed.

Experimentation – A single group pretest – posttest design was followed for experimentation.

Analysis : Percentage of students mastered each item of the division included in the tool administered was compared at pretest and posttest stage.

Major Findings and Implications : The remedial instruction program for developing the concept and procedure of division for dyscalculics was very effective. Developing arithmetic concepts and skills should be emphasized among dyscalculics, through remedial programs.

STRATEGIES TO DEVELOP CONCEPT AND PROCEDURE OF DIVISION IN CHILDREN WITH DYSCALCULIA

GOWRAMMA. I.P. and RAMAA.S., INDIA

The concept of division is confusing and the process is very complex for children with Dyscalculia. Hence attempts should be made to develop remedial instruction programme for teaching arithmetic for them.

The present paper deals with strategies to develop concept and procedure of division among Children with Dyscalculia (CWD).

Purpose

The purpose of the study was to identify, diagnose the errors and develop instructional materials for Dyscalculics in Arithmetic. In this paper, details of planning and experimentation of the remedial instruction program are given. It is also attempted to compare qualitatively the pretest, post-test performance of the subjects in all the items of the division included in the tool administered.

Before attempting to develop the concept and procedure of division, it was essential to enable the CWD to master the prerequisite concepts and skills – number concept, addition, subtraction and multiplication. Such an attempt was done through a systematic remedial instruction program and was found effective.

The following table gives the Mean Performance of CWD on pretest and post-test in different aspects of arithmetic (N = 8).

Table 1 : Mean Performance of CWD on pretest and post-test in different aspects of arithmetic (N = 8)

Aspects of Arithmetic	Pre-test		Post-test		t-ratio
	M	SD	M	SD	
Number concept	15.12	3.22	41.00	1.30	21.01
Addition	5.37	4.20	52.25	6.06	17.96
Subtraction	1.12	2.79	43.0	2.39	32.17
Multiplication	0.75	1.48	29.88	2.85	25.61
Division	0	0	18	0	No value

Objectives

In the present paper only the procedure of planning and validation of the effectiveness of the remedial instructional program to improve the concept and procedure of division among CWD are discussed. The objectives were to develop concept and skills relating to division at one step, long division and simple problem solving.

Method

The above objectives were achieved in two phases.

- To develop a remedial arithmetic program to teach division to CWD.
- To find out the effectiveness of the remedial program developed to teach division through experimentation.

Sample

For the purpose of experimentation, 8 children with dyscalculia who were free from reading and writing disorders were chosen, from the point of feasibility of administering the remedial instruction program.

Planning the Remedial Program

Based on the difficulties experienced by children with Dyscalculia in arithmetic in general and division in particular a remedial program was planned. While planning the program general principles of teaching arithmetic and also specific principles of teaching division were incorporated.

Main features of the Remedial Program

Each lesson had a specific objective; activities were arranged in sequential order as per the pre-requisite; each session required 15 – 20 minutes covering a specific concept/skill; emphasis was on verbalization and visualization for concept clarity and mastering of skill. The task of division was analysed into seventeen sub tasks and arranged in graded order with minimum difference in the complexity between two sub-tasks.

Experimentation

The Remedial Instruction Program planned in the study was tried out on 8 cases with a single group pretest posttest design. Sufficient and variety of activities were given for mastery of each sub-task. Child was allowed to proceed to the next task only after mastery of the previous sub-task. Though the program was common to teach division to dyscalculics, according to the need of the child, modifications were done to ensure mastery, by every child.

The result of the experimentation is given in the following tables in terms of percentage of cases passed in each item of the Division as measured by Arithmetic Diagnostic Test (Ramaa, 1990, 1993).

Table 2 : Percentage of cases passed in pre-test and post-test in division

Task	Item	Percentage in pre-test	Percentage in post-test
Division at one step	1.	0	100
	2.	0	100
Long Division	1.	0	100
	2.	0	100
	3.	0	100
	4.	0	100
Problem Solving	1.	0	100
	2.	0	100

Major Findings and Implications

The procedure adapted in the study implies that dyscalculics can be taught even the most difficult of the fundamental operations like multiplication and division by following systematic and scientific procedure. This will enable the dyscalculic individuals to deal with arithmetic sums independently. That means there may not be any need for depending solely on computing devices, which might at the most help in mechanical calculation. Calculators will not be of any use in solving arithmetic problems wherein the individual has to decide the operation to be performed. So due weightage should be given for teaching arithmetic to children with dyscalculia, through specially designed remedial instruction program.

4th WORLD CONGRESS on DYSLEXIA

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ABSTRACTS

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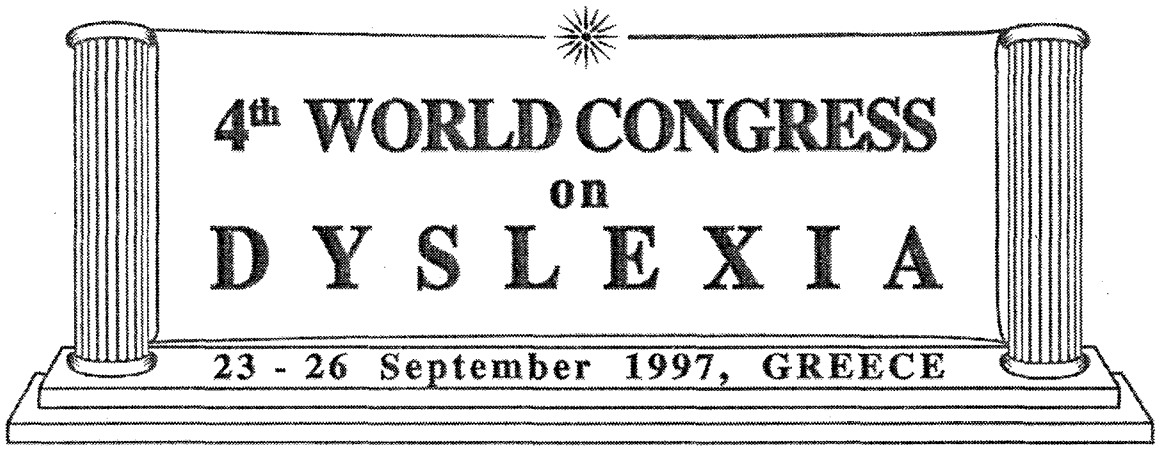

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ABSTRACTS

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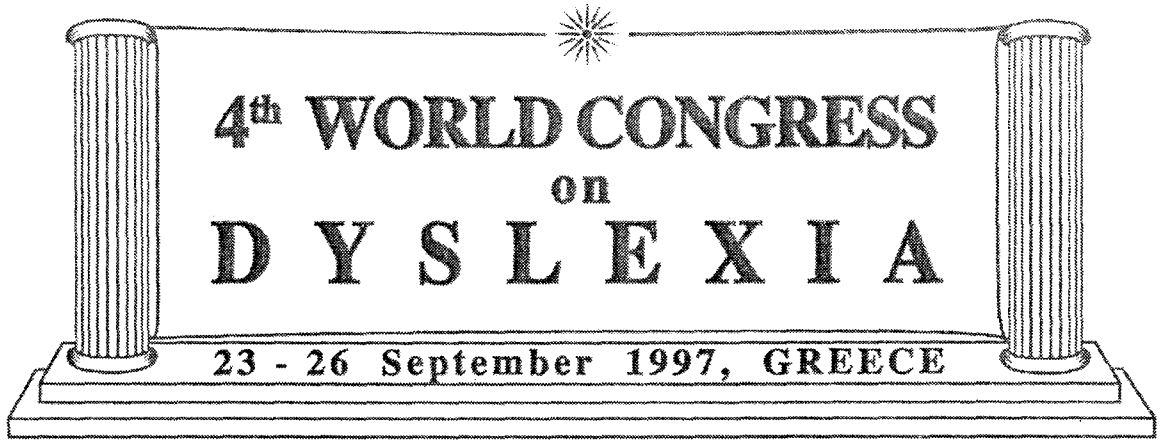

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22. S.A. of Mines & Gold Manufacturing – Stratoni – Halkidiki – Greece
23. Thessaloniki Water Organizaton – Greece (ΟΥΘ)
24. «Hellinika Grammata» Publisher

ACNOWLEDGENTS

This program exists thanks to the dedicated work by many colleagues from the Dyslexia and aOphthalmokinesis Lab and from the Panhellenic Dyslexia Association. I wish to sincerely personally thank each one of the following colleagues:

Teflioudi Anastasia
Ignatiadis Leonidas
Arapidou Sylvia
Tzivinikou Sotiria
Goniadou Anna
Lynch Lisa
Lakidou Fotini
Galanopoulou Zoi
Mystakidou Vicky
Kotsani Chrysoula
Horomidoud Maria
Matamia Anastasia

letters and sillables, inserting additional letters, writting words together, begining to write one world and ending this world by the sillable of another one, writing all the words together in one sentence and at last ignoring all punctuation signs.

Some children wrire sentences by separate letters linked choatically. Results analysis of investigations shows that the pupils with great defects of oral speech have difficulties in teaching of writing and reading. These difficulties are stable and specific for such children.

AN EXPERIMENTAL STUDY TO REMEDIATE CHILDREN WITH DYSCALCULIA IN MYSORE CITY

I.P.GOWRAMMA AND RAMAA.S.

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The purpose of the study is to provide remedial instruction program to teach children with dyscalculia in primary schools.

The objectives were developing a remedial instruction program and finding the effectiveness of the program developed.

To achieve the above objectives children were identified from IIIrd and IV th grades of primary schools in Mysore City. 5.82% of children were found to have dyscalculia . They were diagnosed for specific error patterns on the basis of which remedial program was developed. Some well established principles were also kept in mind while developing the program to teach children with dyscalculia.

To validate the effectiveness of the above program a pre-test- post-test single group design was used.

Design of the study:

Pre-test : Assessment of number concept, fundamental operation and reasoning

Treatment:Administration of the remedial instruction program.

Post-test :Assessment of number concept, fundamental operation and reasoning.

The data was analyzed by computing group means, variance and t-ratio. The result shows that the remedial program is highly effective in improving the arithmetic performance of children with dyscalculia.

The program developed is useful to train teachers and it is also beneficial to parents . Other than children with dyscalculia , whoever has problems in learning arithmetic at pri-

mary school level can make use of the program.Since arithmetic is not language bound the program can be used world wide with suitable adaptations.

BRAIN MORPHOLOGY DIFFERENCES IN DYSLEXIA AND SPECIFIC LANGUAGE IMPAIRMENT

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The planum temporale and pars triangularis (anterior speech area) have been found to be larger in the left hemisphere that the right in individuals with normal language skills. Brain morphology studies of individuals with developmental language disorders, such as dyslexia and specific language impairment (SLI) report reversed asymmetry of the planum. Pars triangularis has not been studied in the developmental language impaired population. In this study, magnetic resonance imaging (MRI) was used for quantitative comparisons of the planum temporale and pars triangularis in children with SLI and children with normal language skills. The subjects were 11 children with SLI and 19 age and sex matched controls between 5.6 and 13.0 years of age. Each subject received a neurolinuistic battery of tests and an MRI scan. Major results included: (1) greater rightward asymmetry of the planum + in the SLI children than in the control children; (2) reversed planar asymmetry correlated strongly with phonemic awareness; and (3) significantly smaller left pars triangularis in the SLI children than in the control children. Comparison of these findings to findings from morphological studies of children with dyslexia provide evidence to suggest that there may be a different neurobiological bases for dyslexia and SLI, specifically a short left planum. It is also possible that the structural basis of dyslexia should be sought in higher order language areas such as the angular gyrus whereas the structural bases of SLI might be found in lower level areas such as the primary and/or auditory association cortex.

DEVELOPMENT OF A REMEDIAL PROGRAM OF LANGUAGE FOR CHILDREN WITH LANGUAGE DISABILITIES IN KANNADA, A SOUTH INDIAN LANGUAGE

SRIMANI C.R., MS. & RAMAA S., DR.

Regional Institute of Education, Mysore, India.

The present study aimed at developing a remedial program of language and evaluating its effectiveness on Children with Language Disabilities in Kannada (CLLD), considering the need to develop a comprehensive remedial language program in different languages.

The study had two major objectives :
To plan a common remedial program of language for CLLD.
To study the effectiveness of the program in improving the CLLD's performance in the various component of language.

The subjects for the study were selected based on the standard approach recommended by Stark & Tallal (1980) following the exclusionary approach. A detail diagnosis of different components of language was done on 68 children identified as CLLD to determine their specific areas of language defects.

The remedial program of language was planned out on the basis of the profiles relating to strengths and weaknesses in language of CLLD, and also by keeping established principles of the language program in mind. The remedial program was evaluated on CLLD using a single group pre-test post-test design.

The percentage of CLLD in the study was 6,84. They showed significant difficulty in all the components of language as compared to their normal peers expect in phonology. The remedial program of language was effective in improving their language performance as shown by the post-test results.

AN EXPERIMENTAL STUDY TO REMEDIATE CHILDREN WITH DYSCALCULIA IN MYSORE CITY

Authors

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PAPER PRESENTED AT

THE 4th WORLD CONGRESS
on
DYSLEXIA

HALKIDIKI GREECE,

23 - 26, SEPTEMBER 1997

Title : AN EXPERIMENTAL STUDY TO REMEDIATE CHILDREN WITH DYSCALCULIA IN MYSORE CITY

I P GOWRAMMA & S. RAMAA, Regional Institute of Education, Mysore.

ABSTRACT: The purpose of the study is to provide remedial instruction program to teach children with dyscalculia in primary schools.

The objectives were developing a remedial instruction program and finding the effectiveness of the program developed.

To achieve the above objectives children were identified from IIIrd and IV th grades of primary schools in Mysore City. 5.82% of children were found to have dyscalculia . They were diagnoised for specific error patterns on the basis of which remedial program was developed. Some well established principles were also kept in mind while developing the program to teach children with dyscalculia.

To validate the effectiveness of the above program a pre_test- post_test single group design was used.

DESIGN OF THE STUDY:

Pre_test - assessment of number concept fundamental operation and reasoning.

Treatment-Administration of the remedial instruction program.

Post_test -Assessment of number concept fundamental operation and reasoning.

The data was analysed by computing group means and variance and test of significance of difference of means. The result shows that the remedial program is highly effective in improving the arithmetic performance of children with dyscalculia.

The program developed is useful to train teachers and it is also beneficial to parents . Other than Children with dyscalculia , who ever has problem in learning arithmetic at primary school level can make use of the program. Since arithmetic is not language bond the program can be used world wide with suitable adaptations.

AN EXPERIMENTAL STUDY TO REMEDIATE CHILREN WITH DYSCALCULIA IN MYSORE CITY

I P GOWRAMMA & S. RAMAA, Regional Institute of Education, Mysore.

The purpose of this study is to provide remedations with dyscalculia in the specific defecit area in arithmetic to reduce the gap between the child's ability and grade level performance. There is a dearth of research in the area of dyscalculia not only in India but all over the world. The review of research studies in this area showed the need for a systematic and structured program of arithmetic to teach all the basic skills for children with dydcalculia.

OBJECTIVES OF THE STUDY:

1. To develop suitable arithmetic program to improve arithmetic performance among children with dyscalculia,
2. To study the effectiveness of the above program in improving the arithmetic performance children with dyscalculia.

Sample: In order to achieve the above objectives there was a need to identify and diagnoise children with dyscalculia. The following criteria and tools and techniques were used for identification of children with dyscalculia.

SL No.	CRITERIA FOR DETERMINING DYSCALCULIA	TOOLS AND TECHNIQUES EMPLOYED
1.	Normal in sensory, visual or auditory functioning .Visual tracking eye-hand co-ordination	1. Teachers opinion 2. Self reporting 3. Copying a sentence
2.	Without any serious emotional disturbance	1. Teacher's opinion 2. Observation
3.	At or above 8years old	1. School records
4.	atleast 2yrs retarded in arithmetic	1. Grade level(assessment device, Narayan, 1994.)
5.	Normal in auditory reception	1. Auditory reception test (Ramaa 1985)
6.	As adequate academic achievment motivation	1. Academic achievment motivation inventory (Ramaa 1985)
7.	Has received extra help at home.	1. Self report
8.	Normal in intelligence	1. Raven's CPM (Raven 1965

Applying the above criteria 82 students were identified from among 1400 students in 5 schools of mysore city in IIIrd and IV th grade children thus identified were administered arithmetic diagnostic test(Ramaa 1994). The test helps to find out the strength and weaknesses of the children with reference to different types of arithmetic tasks . The strategies adopted by them to do different kinds of sums, appropriateness of these stategies to the grade level, the types of errors committed by the children while doing the sums will reveal the areas in which they require remedial instruction.

Some of the common errors noted with the help of diagnostic testing are:

1. Number Concept : a) Rotation of numbers b) Reversal of digits c) Reading digitwise
2. Addition : a) Sum of all digits b) does not carry over. c) adds left to right
3. Subtration: a) Sudtracts lesser number from greter number b) Does not regroup c) cannot subtract when '0' is present.
4. Mutliplication :a) Adds the numbers. b) Cannot carry the digits c) Cannot multiply '0'
5. Division : a) Does not use remainders b) Forgets steps'
6. Reasoning: a) Difficulty to comprehend b) difficulty to state the problem c) Difficulty to estimate

READING AND WRITING WERE ASSESSED USING KANNADA WORD RECOGNITION TEST(RAMAA 1985)

The sample so identified to identify the categories among children with dyscalculia. The foll., categories were identified.
a) Dyscalculia with reading difficulty b) dyscalculia with writing difficulty c) Dyscalculia with reading and writing difficulty. d) Dyscalculia without reading and writing difficulty.

Remediation was done on the last category was done on the last category since it could be difficult to teach reading and writing to the other groups as they are the prerequisite to learn arithmetic.

PLANNING THE REMEDIAL PROGRAM

While planning the remedial program Principles suggested by various authors were utilised . Some of the important principles are
1. Readiness skills should be emphasised .
2. Teach same concept in different representations.
3. Use simple vocabulary
4. Teaching should have direct impact on child's perceptual facility

5. Foster Cognitive development and arithmetic skill simultaneously.
6. Individualise the instruction
7. To compensate the areas of deficit multisensory attack should be made.
8. Associate arithmetic to daily life.
9. Arrange instruction in learning heirachy.
10. Immediate and continious success for the studentin basic to math instruction

Keeping the above principles the remedial program was planned . Some of the main features of the remedial program
1. The program was developed in such a way that it caters to the need of majority of children of the study. Thus it is a common program which can be used to any child with dyscalculia to develop prerequisite skills , number concept, arithmetic operation and reasoning.
2. Each lesson has a specific objective.
3. Activities are arranged in sequential order . Only after ahieving the objective of the previous lesson, student can go to the next lesson.
4. Lessons are made short requiring 15-20 minutes , covering a single concept
5. Evaluation is done before going to the next activity.
6. each activity emphasises on verbalisation and visulaisation for concept clarity and acquisition of skill, as children with dyscalculia have poor auditory memory.
7. Every activity contained 20-25 similar sums to provide enough practise.
9. Learning activities were linked to the previous activities.
10. Concepts were taught using concrete materials. slowly it was shifted to semiconcrete and finally abstract form of numbers were used.
11. Activities used for individual child depended upon the ability of the particular child and suoted his learning style.

In order to validate the effectiveness of the above program a pre-text single group design was considered appropriate because of inter individual differences among identified children and non-availability of the matched control group.

Design of the study:

Pre-Test - Assessment of number concept fundamental operations and reasoning by administering Arithmetic diagnostic test(Ramaa 1994)

Treatment - Adminstration of the remedial instruction program developed by the investigator.

Post-test - Assessment of the number concept, fundamental operations and reasoning by administering arithmetic diagnostic test (Ramaa 1994)

The treatment was retricted to 8 children. The reason being the children of the study were scattered in different schools and intensive treatment to small groups had to be given. However the sample was as representative as possible with reference to difficuties in different arithmetic sums. The treatment was given for a period of 5 months in a season of 45-50 minutes during week days.

ANALYSS :

The data was analised by computing rule means and various and test of significance of difference of means.

Tables below show the performance of subjects on pre-test and post-test.

Table_Performance on pre-test and Post-test :

CASES	GRADE THEY WERE IN	PRE-TEST SCORES	GRADE LEVEL	POST-TEST SCORE	GRADE LEVEL
1.	3rd	22	Below 1st grade	117	above 2nd grade
2.	3rd	16	''	96	''
3.	4th	15	''	118	''
4.	4th	29	''	109	''
5.	4th	13	''	117	''
6.	4th	20	''	93	''
7.	4th	25	''	124	''
8.	4th	38	''	120	''

Table 2-M, SD and t ratio for pre-test and post-test

	Mean	Standard Deviation	t(significant at 0.01 level)
Pre-test	22.25	7.78	20.96
Post-test	111.75	10.72	

From the above table it can be understood that the experimental group performed significantly better in the post-test indicating the remedial program is highly effective in improving the arithmetic performance of children with dyscalculia.

Quantitative analysis of the data with reference to single cases and individual items will also be done.

SUMMARY: The research finding shows 5.82% incidence of dyscalculia in primary schools . It is also observed that the performance of children with dyscalculia can defnitely be improved by using a program structured on the basis of important principles and statergies highlighted in the study. Improvement in grade level performance is observed. Qualitative analysis will give a better picture about the effectiveness of the program with reference to individual cases.

Practical applications and benefits:

1. the program developed is useful in training teachers to deal with children with dyscalculia.
2. Parents can also be bebefited as it is structured and simple.
3. Not only dyscalculias , other children whoever have difficulty in arithmetic for various reason will also be benefited
4. Since arithmetic is not language bound the program can be used world wide with suitable adaptations.

DEVELOPMENT OF A REMEDIAL PROGRAMM OF LANGUAGE FOR CHILDREN WITH LANGUAGE DISABILITIES IN KANNADA - A SOUTH INDIAN LANGUAGE

Authors

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PAPER PRESENTED AT

THE 4th WORLD CONGRESS
on
DYSLEXIA

HALKIDIKI GREECE,

23 - 26, SEPTEMBER 1997

ABSTRACT:

Development of a remedial program of language of children with language disabilities in Kannada, a south Indian language.

C R Srimani and Ramaa S , Regional Institute Of Education, Mysore, INDIA.

The present study aimed at developing a remedial program of language and evaluate its effectiveness on children with language disabilities in Kannada (CLLD), considering the need to develop a comprehensive remedial language program in different languages.

The study had 2 major objectives :

1. To plan a common remedial program of language for CLLD.
2. To study the effectiveness of the program in improving the CLLD's preformance in the various components of language.

The subjects for the study were selected based on the standard approach recommended by Stark & Tallal (1980) following the exclusionary approach. A detail diagnosis od different components of language was done on 68 children identified as CLLD to determine their specific areas of language deficits.

The remedial program of language was planned out on the basis of the profile relating strengths and weaknesses in language of CLLD, and also by keeping established principles of language programs in mind.

The remedial program was evaluated on CLLD using a single group pre-test post-test design.

The percentage of CLLD in the study was 6.84. They showed significant difficulty in the components of language when compared to their normal peers except phonology . The remedial program of language was effective in improving their language performance as shown by the post-test results.

DEVELOPMENT OF A REMEDIAL PROGRAM OF LANGUAGE FOR CHILDREN WITH LANGUAGE DISABILITIES IN KANNADA, A SOUTH INDIAN LANGUAGE.

C R Srimani and Ramaa S , Regional Institute Of Education, Mysore, INDIA.

The present was an attempt to develop a suitable remedial program of language and evaluate its effectiveness on children with language learning disabilities in Kannada (CLLD). The study was undertaken as there was limited research in remedation of language disabilities, especially few which focus on all the components of language and there was a need to develop a remedial program for such children in different languages.

OBJECTIVES:

1. To plan out a common remedial program of language for CLLD.
2. To study the effectiveness of the so developed remedial language program in improving these children's performance in the following components of language:

a) Phonology b)Receptive vocabalary c) Auditory reception d) Semantics e) Syntax f) Aural comprehension g) Verbal Expression

SUBJECT SELECTION CRITERIA:

To achieve the above objectives identification of CLLD & diagnosing their specific deficit areas were necessary .

The identification procedure was based on exclusionary criteria specified by Stark and Tallal(1980). The Procedure followed is shown in table 1:

CRITERIA AND TOOLS/TECHNIQUES FOR IDENTIFYING CLLD

Criteria For determining language disability	Tools/Techniques employed
1. Kannada speaking and no bilingualism	a) Records b) Self Reporting
2. No language difference	a) Interview
3. No hearing problems	a) School Health Records
4. No severe speech motor problems	a) Informal interaction b) Teachers report
5. No emotional behavioral problems	a) School Health Records b) Teacher's Report
6. No nuerological defects	a) Past History b) Interaction
7. Normal intellectual functioning	a) Coloured Progressive Matrices(Raven, 1965)
8. Overall language age atleasst 12months below age requirement.	a) Linguistic Profile Test (Karanth, 1980)

By following the above approach, 68 children from a total of 995 children in 15 Kannada medium Primary Schools were identified as those with language disabilities.

These children(CLLD) were diagnosed to determine their specific areas of deficits. The table below gives the components of language in which diagnosis was done with the diagnostic tools.

TABLE 2 : Components of language assessed with the respective diagnostic tools

Language Components Covered	Name of the test used
1. Auditory reception	Auditory reception tset in Kannada(Ramaa, 1984)
2. Reception Vocabulary	Peabody Picture Vocabulary test adopted to Kannada by the investigator(Dunn, 1965)
3. a) Phonology b) Syntax c) Samantics in both receptive and expressive modalities	Linguistic profile test (LPT) Karanth 1980
4. Auditory comprehension	Aural Comprehension test in Kannada(Ramaa, 1984)
5. Verbal expression	Verbal Expression sub test of Illinois Test of Psycholinguistic Abilities (ITPA)(Kirk, 1968)

The diagnosis showed the children with language disabilities have significant difficulty in most components of language as under 1. Auditary reception. 2. Receptive Vocalbalary 3. Syntax 4. Semantics 5. Aural comprehension 6. verbal expression.

These children however did not exhibit significant difficulty in phonology as compared to their normal peers.

Planning the Remedial Program Of Language:
The remedial program was planned based on :
1. Specific areas on strength and weaknesses of CLLD in different components of language.
2. Well-established principles of language development programs.
3. The distinctive fesatures of Kannada language.

Main feature of the remedial program of language:
1. Each lesson has a specific objective of teaching a single component of language (either a word, category or form), first in the receptive modality only then, in the expressive modality.

2. The components of language included were structured based on normal sequence of language development.
3. The first few lessons focussed on Semantic aspects like vocabulary, classification skills with concepts. Lessons on syntax were included only after most semantic skills were taught.
4. While teaching each component in Semantics with syntax, visual representations (Object/pictures/printed forms of the words) were used in the initial stage with these visual retrieval aids were later removed.
5. Every exercise contained atleast 15 to 20 similarly structured items to provide sufficient drill to the child.
6. Comprehension was ensured in each child for every component taught.
7. Games with activities were used in training most components.
8. For teaching syntax the following type of exercises were included.
   a. Classification of different forms
   b. Sentence completion with oral cloze.
   c. Directed rule application.
   d. Recognition withjudgement of correct forms.
   e. Normalization of scrambled sentences.
9. The activities used for each child was based on his ability profile and his individual style of learning.
10. Each lesson includes recapitulation with inclusion of previously learnt concepts.

Evaluating the remedial language programme

The remedial program was tried out on 11 CLLD for a period of 20 weeks in about 100 sessions of 50-60 minutes duration each. These children were chosen based on their diagnostic language profiles so as to truly represent the different areas of language disablilities.

An experimental single group pre-test post-test design was adopted to evaluate the remedial program of language, owing to difficulty in getting match controls.

The experimental design was Pre-test : ASSessment of Phonological Semantic with Syntactic abilities, Auditory reception, Receptive vocabulary Aural comprehension with verbal expression.

Treatment : Administration of remedial program of language.

Post-test : Assessment of all language components as in pre-test.

Analysis with Results

The pre-test with post-test data were analyzed by computing the t-ratio. The results are shown in table-3.

TABLE 3 : Mean S D , with t-ratio for pre-test with post-test

COMPONENTS	TEST	MEAN	S.D	T-VALUE
PHONOLOGY	Pre-Test	95	2.83	3.4
	Post-Test	96.46	1.93	*
SYNTAX	Per-Test	23.05	13.84	10.33
	Post-Test	64.86	3.42	*
SEMANTICS	Pre-Test	64.27	8.41	12.03
	Post-Test	94.09	2.11	*
TOTAL SCORE ON LINGUISTIC PROFILE TEST	Pre-Test	185.4	19.26	12.96
	Post-Test	255.41	4.95	*
AUDITARY RECEPTION	Pre-Test	19.91	2.35	2.94
	Post-Test	21.82	1.19	*
RECEPTIVE VOCABALARY	Pre-Test	49	10.12	5.31
	Post-Test	66.64	3.42	*
AURAL COMPREHENSION	Pre-Test	11.82	5.97	6.23
	Post-Test	22.27	1.6	*
VERBAL EXPRESSION	Pre-Test	15.91	5.13	9.01
	Post-Test	36	3.44	*

Note : N = 11
* = t-value significant at 0.01 level
Similar analysis was done in different sub-components in syntax with semantics which showed significant difference between Pre-test with Post test performance.

From the table, we can see that there is a significant difference in post-test as compared to the pre-test indicating the effectiveness of the remedial instructional program of language for CLLD.

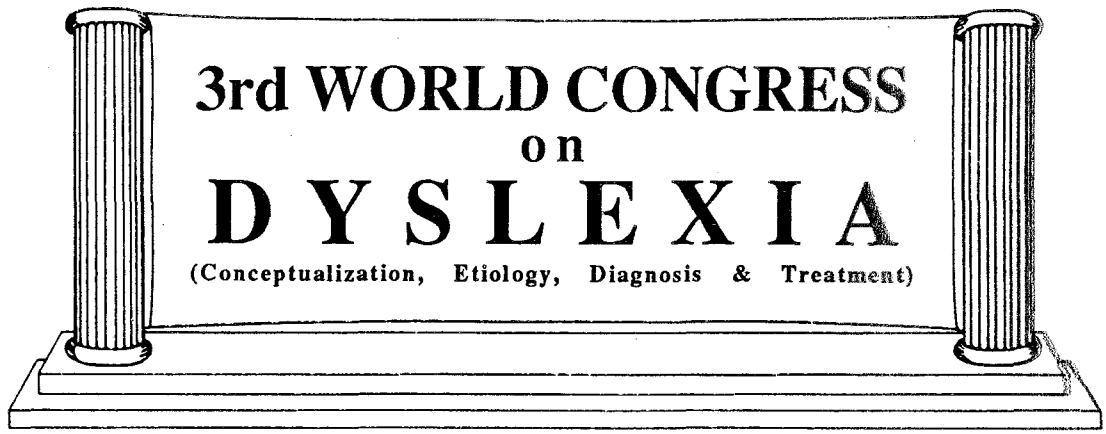
Qualitative analysis was done for individual cases with reference to different items. Results showed significant improvements in majority of the items.

Summary of findings :

As high as 6.84% of children were identified as CLLD. CLLD showed significant improvement in the different components of language with the help of the remedial language program planned out in the study.

Practical implications :

1. The remedial program of instruction so developed can be used by teachers with parents to remediate not only CLLD but also children with difficulties in language due to various reasons.
2. Guidelines with framework of remedial program can be used for developing remedial program not only in Indain languages but also in other languages.



3rd WORLD CONGRESS
on
DYSLEXIA
(Conceptualization, Etiology, Diagnosis & Treatment)

JUNE 28 - JULY 3, 1987
CRETE, GREECE

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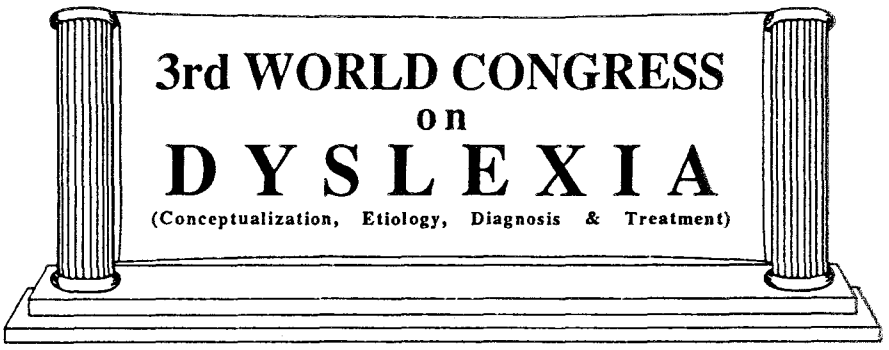
PROGRAM



JUNE 28 - JULY 3, 1987
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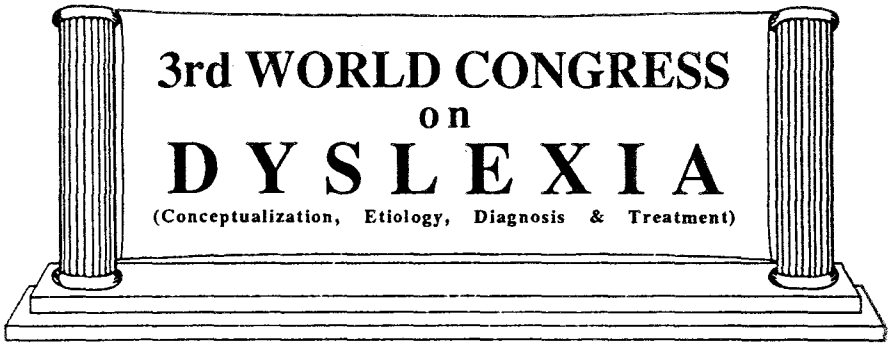
* The committee and the participants of the 3rd WORLD CONGRESS ON DYSLEXIA wish to thank the official carrier, Olympic Airways and the Greek National Tourist Organization for their generous assistance and warm hospitality.



PROGRAM

SUNDAY, JUNE 28, 1987

8:00 - 9:00 **REGISTRATION**

9:00 - 9:10 **WELCOME**
Prof. George Th. Pavlidis - Chairman, Congress Committee

9:10 - 9:15 **OPENING OF CONGRESS**
Mr. Dimos Papadimitriou, Deputy - Minister of Education, GREECE

9:15 - 9:45 READING WITHOUT EYE MOVEMENTS: DYSLEXICS READ FAST AND COMPREHEND AS WELL AS NORMAL READERS
Prof. George Th. Pavlidis - Department of Pediatrics,UMDNJ-Robert Wood Johnson Medical School, Piscataway, NJ 08854, USA

9:45 - 10:00 **BREAK**

10:00 - 12:30 **SYMPOSIUM: SUBTYPES OF DYSLEXIA**

CHAIRMAN - ORGANIZER
Prof. Byron P. Rourke, CANADA

10:00 - 10:30 NEUROPSYCHOLOGICAL INVESTIGATION OF LEARNING-DISABILITY SUBTYPES: METHODOLOGY, DEPENDENT VARIABLES, SUBTYPE X TREATMENT INTERACTIONS, AND EXTERNAL VALIDATION
Prof. Byron P. Rourke - Department of Psychology, University of Windsor, Windsor, Ontario N9B 3P4 CANADA

10:30 - 11:00 METHODOLOGICAL ISSUES IN SUBTYPING INVESTIGATIONS
Prof. Robin Morris & Prof. Paul Satz*, - *Center of Health Sciences, UCLA, Los Angeles, CA, USA

11:00 - 11:30 ELECTROPHYSIOLOGICAL VARIABLES IN LEARNING DISABILITY SUBTYPES
Prof. Dirk J. Bakker - Free University, 1075 AD Amsterdam, THE NETHERLANDS

11:30 - 12:00 INFORMATION PROCESSING DEFICITS AND PERSONALITY DIMENSIONS IN SELECTED SUBTYPES OF LEARNING-DISABLED CHILDREN
Prof. J.E. Del Dotto, Dr. J.L. Fisk, & Prof. B.P. Rourke* - *Department of Psychology, University of Windsor, Windsor, Ontario, N9B 3P4 CANADA

12:00 - 12:30 DISCUSSANT - DISCUSSION
Prof. K.M. Adams, USA

12:30 - 13:30 **LUNCH**

13:30 - 15:30 **SYMPOSIUM: EFFECTIVENESS OF TREATMENT OF DYSLEXIA**

CHAIRMAN - ORGANIZER
Prof. J.J. Dumont, THE NETHERLANDS

13:30 - 14:00 THE TREATMENT OF DYSLEXIA
Prof. Johan J. Dumont*, Dr. J.H.L. Oud, Dr. I. van Mameren, Dr. M.J. van Herpen, Dr. F. van den Bekerom, & Dr. M. Jacobs - *Institute of Orthopedagogics, University of Nijmegen, THE NETHERLANDS

14:00 - 14:30 REPETITION AND AUDIO SUPPORT IN THE REMEDIATION OF DYSLEXIA
Prof. Aryan van der Leij*, Prof. Victor van Daal - *Department of Special Education, Free University, 1075 AD Amsterdam, THE NETHERLANDS

14:30 - 15:00 NEUROPSYCHOLOGICAL TREATMENTS OF DYSLEXIA
Prof. Dirk J. Bakker - Free University, Dept./Developmental & Educational Neuropsychology, Paedologisch Instituut, Amsterdam, THE NETHERLANDS

15:00 - 15:30 DISCUSSION

18:30 - **AN UNFORGETTABLE CRETAN EVENING...**
Hosted by the Greek National Tourist Organization

MONDAY, JUNE 29, 1987

CHAIRMAN
Mr. David Gow - Headmaster, The Gow School, S. Wales, NY, USA

9:00 - 9:25 DEVELOPMENT OF REMEDIAL READING PROGRAM FOR DYSLEXICS OF KANNADA LANGUAGE
Dr. S. Ramaa* & Dr. M.S. Lalithamma - *Regional College of Education, (NCERT), Mysore - 570006, INDIA

9:25 - 9:50 DOSE-TIME-ACTION EFFECTS OF PIRACETAM ON EVENT-RELATED POTENTIALS IN SEVERE DYSLEXICS
Prof. C. Keith Conners & Dr. M.J. Reader* - *Department of Psychiatry, George Washington University School of Medicine, Washington, D.C., USA

CHAIRPERSON
Prof. Susan Vogel, USA

10:15 - 10:45 COGNITIVE DEFICITS CONCOMMITANT WITH ADULT DYSLEXIA
Prof. Marcel Kinsbourne - Department of Behavioral Neurology, Kennedy Schriver Center, Waltham, MA 02254, USA

10:45 - 11:15 ASSISTING LEARNING DISABLED STUDENTS IN TRANSITION FROM HIGH SCHOOL TO COLLEGE
Dr. Edwin W. Martin*, **Mr. Craig Michaels**, & **Ms. Amy Gottlieb** - *Human Resources Center, Alberston, NY 11507, USA

11:15 - 11:30 DISCUSSANT - DISCUSSION
Prof. Susan Vogel - Department of Special Education, Northeastern Illinois University, Chicago, IL 60625, USA

11:30 - 12:00 LETTER CONFUSIONS IN CZECH DYSLEXICS
Prof. Zdenek Matejcek* & **Dr. J. Sturma** - *Postgraduate Medical Institute, 100 00 Praha 10, CZECHOSLOVAKIA

12:00 - 12:30 AN ALTERNATIVE EXPLANATION TO THE ERRORS COMMITTED BY DYSLEXICS
Dr. M.S. Lalithamma* & **Dr. S. Ramaa** - *Department of Education, University of Mysore, Mysore-57006, INDIA

12:30 - 13:30 **LUNCH**

CHAIRMAN
Prof. Zdenek Matejcek, CZECHOSLOVAKIA

13:30 - 14:00 DO GREEK CHILDREN (GOOD AND POOR READERS/SPELLERS) USE SIMILAR PROCESSES IN READING AND SPELLING OF WORDS?
Prof. Constantinos Propodas - Department of Education, University of Patras, 26110 Patras, GREECE

14:00 - 14:30 CROSS-LINGUISTIC COMPARISON OF ENGLISH AND GREEK: READING AND SPELLING ERRORS IN GRADES 2, 4 AND 6
Ms. Theophano Megalokonomos - Carleton University, Ottawa, CANADA

14:30 - 15:00 AN ANALYSIS OF THE READING AND SPELLING SKILLS OF CHILDREN WHO SHOW SIGNIFICANT DISCREPANCIES IN THEIR READING AND SPELLING ABILITIES
Prof. Gloria S. Waters* & **Prof. Margaret Bruck** - *McGill University, Montreal, P.Q. H3G-1A8, CANADA

15:00 - 15:15 **BREAK**

15:15 - 15:45 READING IN A DEEP ORTHOGRAPHY: CONSEQUENCES OF AN OPAQUE RELATIONSHIP BETWEEN PHONOLOGY AND ORTHOGRAPHY ON READING AND READING DISORDERS
Prof. Shlomo Bentin - Department of Neurology, Hadassah Hospital, Jerusalem 91 120, ISRAEL

AN ALTERNATIVE EXPLANATION TO THE ERRORS COMMITTED BY DYSLEXICS

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Paper Presented at the Third World Congress on Dyslexia
Island of Crete, GREECE, June 28 – July 3, 1987

AN ALTERNATIVE EXPLANATION TO THE ERRORS COMMITTED BY DYSLEXICS

ABSTRACT

The paper is about an attempt made by Ramaa (1985) in analysing the errors committed by dyslexics while reading words of Kannada, a south Indian language. The study aimed at comparing the dyslexics with non-dyslexic poor readers and normal readers on the letter substitution and reversal errors and also to explain these errors to the light of neuropsychological processes related to word recognition.

The study vas carried cut on 14 dyslexics, 14 dyslexic poor readers and 14 normal readers who were matched on relevant variables.

Data related to the reading errors were collected by administering a Kannada word recognition test and were analysed by comparing the frequency of such errors among all the groups. Such an analysis was extended even to the sub-types of these errors. It was observed that dyslexics differed from the other two groups in the frequency but not in the kinds of errors.

Data related to the neuropsychological processes were collected by administering a series of tests individually. The data were analysed by employing ANOVA. It was observed that dyslexics were inferior to the other two groups only in visual-verbal association and world analysis abilities. It was concluded that letter substitution errors among dyslexics can be exclusively attributed to deficiency in visual-verbal association. Reversal errors may be due to non-cognitive factors like impulsivity or guessing instead of any specific disability. The paper questions the validity of considering types of errors as criterion for identifying and classifying dyslexics and also the significance of the theories like cerebral dominance as an explanation for dyslexia.

BACKGROUND

Many studies have attempted to classify dyslexics into different groups on the basis of types of errors (like Boder, 1973; Lucius, 1980). The validity of such a classification has to be established on the basis of underlying neuropsychological functions. Such studies are needed in different language contexts which will help in identifying general and specific reading behavioural symptoms.

Hence the study was done on dyslexics in Kannada, a south Indian language, and focused on only two types of errors, viz. letter substitution and reversal, which are generally studied in other languages and about which consensus is yet to be established.

OBJECTIVES OF THE STUDY

1. To compare dyslexics with non-dyslexic poor readers and normal readers on the errors committed – letter substitution and reversals – while recognising Kannada words.
2. To explain these errors in the light of neuropsychological processes related to word recognition.

SUBJECTS AND SELECTION CRITERIA

From among 550 school going children chosen from grades III and IV within the vicinity of Mysore, 14 dyslexics in Kannada were identified applying a set of exclusionary criteria – normal in symbol tracking, eye-hand coordination, no serious emotional disturbance, at or above 8 years of age, not been absent from school frequently, two years retarded in reading on a Kannada oral reading test, normal in aural comprehension, intelligence, having adequate motivation and received extra

coaching at least since the beginning of the previous academic year. From the same population 14 normal readers and 14 non-dyslexic were identified and selected. The latter were different from dyslexics on the extent of reading retardation which was 1½ years to 6 months and had not received extra coaching prior to the beginning of their academic year. All the three groups were matched on sex, age, school grade, type of school, grade on coloured progressive matrices aural comprehension.

METHOD

Reading errors committed on a Kannada word recognition test (Ramaa, 1985) were identified among all the three groups of readers. The text included 100 words consisting of almost all the letters of Kannada alphabet and a sample of Kagunitha. (In Kannada alphabet almost all the distinct sounds of Kannada language are represented by distinct symbols. The consonant + vowel combinations are also represented by distinct set of symbols which are collectively considered as 'Kagunitha'.) It is an untimed test. The actual responses on recognition of each word were noted irrespective of the mode of reading – whole word perception or letter by letter reading and blending (word attacking skill). Though, it was possible to observe different types of errors, namely, word substitution, letter substitution, Kagunitha substitution, blending and reversal errors among all the groups of readers, the present paper restricts its analysis and discussion to letter substitution and reversal errors only.

A review of research (Faas, 1976; Vernon, 1979; Valett, 1980) suggested that the following neuropsychological processes are important for explaining the above two types of errors.

1. Visual discrimination

2. Visual recognition

3. Visual recall

4. Memory for shapes in sequence

5. Auditory discrimination

6. Memory for auditorily presented digits

7. Word analysis

8. Word synthesis

9. Visual-verbal association – in the context of a word

10. Visual-verbal association – in association

The above processes were assessed among children of all the three groups by administering the appropriate tests individually.

Since the approach employed while reading a word determines the kind and frequency of errors committed by the reader, only qualitative and not quantitative analysis was attempted.

It was observed that letter substitution errors were committed by all the three groups of readers with greater frequency among dyslexics compared to the other two groups of readers. Such an analysis was extended to the sub-types of letter substitution errors also to see whether there is any qualitative or quantitative differences among the three groups. Different types of letter substitution errors were identified on the basis of presence or absence of visual or auditory or auditory-visual similarities between stimulus letter and the response letter. Such a judgement with reference to presence or absence of similarity was done as systematically as possible

by keeping a standard for comparison which was evolved out of a thorough analysis of the visual and auditory features of Kannada alphabet. The standard for comparison with reference to visual features was a set of 12 distinct graphic features. The standard classification of sounds of Kannada alphabet suggested by Nayak (1967) was followed to identify the letters which resemble each other auditorily.

The groups were compared for the frequencies and types of reversal errors also. The data on neuropsychological processes of the three groups of readers were compared using ANOVA.

OBSERVATIONS OF THE STUDY

1. All the three groups got confused usually between letters with auditory or visual or auditory-visual similarities in a descending order of frequency with dyslexics at the top. Even in the case of errors without any apparent similarity between stimulus and response letters dyslexics demonstrated greater frequency compared to the other two groups.
2. The number of reversal errors committed by all the groups was considerably less and the least among dyslexics. Further analysis of the reversal errors revealed that such a reversal resulted in meaningful words in all cases, except one. This was committed by non-dyslexic poor render wherein there was letter substitution also.
3. Dyslexics were inferior to the other two groups only in visual-verbal association and word analysis abilities.

CONCLUSIONS

On the basis of the above observations following tentative conclusions are drawn:

1. There is no qualitative difference among the three groups of readers with reference to letter substitution errors and reversal errors. Such a lack of qualitative difference questions the validity of considering types of errors, particularly letter substitution and reversals as criteria for identifying and classifying dyslexics.
2. The presence of letter substitution errors wherein there is similarity between stimulus and response letters, among normal readers even while they are at grades III and IV, indicates that as the similarity among letters of an alphabet increases the task of learning their names becomes complex. On the other hand, the greater frequency of letter substitution errors without any apparent similarity among children of these grades suggests that this kind of errors can be an indicator of dyslexia.
3. Since dyslexics were not inferior to the other two groups in auditory discrimination and visual discrimination, but were deficient only in visual-verbal association, all the types of letter substitution errors 'with and without any similarity' can be attributed to deficiency in visual verbal association and not to any difficulty in perception. Thus the study supports the inference earlier drawn by Shankweiler, Donald Liberran and Isabelle (1978), Liberman, Shankweiler, Orlando, Harris and Berti (1971). Further, the 'visual spatial' difficulties observed in English language (Ingram, 1967) can be also treated as 'Correlating' errors indicating the difficulty in correlating or associating. This also suggests that

whatever be the types we identify within letter substitution errors, they are superficial and thus cannot become valid criterion for further classification of dyslexics.

4. The observation made in the study with reference to reversal errors contradicts with the earlier notion that reversal error is a symptom among dyslexics which can be attributed to orientation difficulty (O'Neill and Stanley, 1976; Marley, 1949). The meaningful reversal of the words, indicates that all the three groups of readers committed reversals wherever possible only. This inference has several implications. Firstly, it explains the less number of reversals in all the three groups in terms of the limited provision for committing such errors in the test used. Secondly, least number of reversals in case of dyslexics can be attributed to the mode of reading – letter by letter reading rather than whole word perception. Thirdly, as dyslexics did not show any difference in the visual perception reversals in case of dyslexics like in case of the other two, may be attributed to non-cognitive factors such as guessing or impulsivity rather than to any specific disability. It may also be due to the lack of knowledge that there should be correspondence between the temporal order of sounds and that of visual order of letters within the word.
5. In this context it appears appropriate to question the significance of considering the term 'dyslexia' as equivalent to the term 'Strephosymbolia' (twisted symbols), as committing 'visual-spatial' (orientation errors) is not a universal phenomenon rather a language specific one. Further, reversals as indicated in the study may not be a differentiating factor and also may be due to non-cognitive factors. If these

inference are valid, the validity and significance of the theories like cerebral dominance as an explanation for these kinds of observable symptoms are also questionable.

BIBLIOGRAPHY

1. Aaron, F.G. "Dyslexia, an imbalance in cerebral information processing strategies", Perceptual and Motor Skills, 1978, 47(3), 699-706.
2. Boder, Elena, "Developmental dyslexia: Prevailing diagnostic concepts and a new diagnostic approach", Bulletin of the Orton Society, 1973, 23, 106-118.
3. Brave, Validieso, Luis, "Concerning the psychopathology of the dyslexic phenomenon", Revista Chilena de Psycologia, 1980, 3(1), 27-35.
4. Collette, A. Martha, "Dyslexia and classic pathognomic signs", Perceptual and Motor Skills, 1979 (Jun), Vol. 48, (3, Pt. 2), 1055-1062.
5. Faas, A. Larry, Learning Disabilities: A Competency Based Approach, Houghton Miffin Company, 1976.
6. Ingram, T.T.S., "Specific Learning Difficulties in Childhood", In: Educating Children with Learning Disabilities, Edited by Edward C. Frierson and Walter B. Barbe, Meredith Publishing Company, 1967.
7. Johnston, S. Rhora, "Phonological Coding in Dyslexic Reader", The British Journal of Psychology, 1982, 73(4), 455-459.
8. Liberman, I.Y., Shankweiler, D. Orlando, C., Harris, K.S. and Berti, F.B. "Letter confusion and reversals of sequence in the beginning reader: Implications for Orton's theory of developmental dyslexia", Cortex, 1971, 7, 127-142.

9. Morley, E. Krise, "Reversals in reading: A problem in space perception", Elementary School Journal, 1949, 49, 278-284.
10. Nayak, H.M., Kannada Literary and Colloquial, Mysore: Rao and Raghavan, 1967.
11. O'Neill, G. and Stanley, G., "Visual Processing of straight lines in dyslexic and normal children", British Journal of Educational Psychology, 1979, 46(3), 323-327.
12. Ramaa, S., "Diagnosis and Remediation of Dyslexia: An attempt", Unpublished Doctoral Thesis, University of Mysore, Mysore, 1985.
13. Raven, J.C., Coloured Progressive Matrices, London: H.K. Lewis, 1965.
14. Shankweiler, Donald and Liberman, Isabelle, Y., "Reading behaviour in dyslexia: Is there a distinctive pattern?" Bulletin of the Orton Society, 1978, 28, 114-123.
15. Walett, "Dyslexia: A Neuropsychological Approach to educating children with severe Reading Disorders, Costello Educational, 1980.
16. Vernon, M.D., "Variability in reading retardation", British Journal of Psychology, 1979, 70, 7-16.

DEVELOPMENT OF REMEDIAL READING PROGRAMME FOR DYSLEXICS OF KANNADA LANGUAGE

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Paper Presented at the Third World Congress on Dyslexia
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DEVELOPMENT OF REMEDIAL READING PROGRAMME FOR DYSLEXICS OF KANNADA LANGUAGE

ABSTRACT

The paper is about an attempt made by Ramaa (1985) in developing remedial reading material in Kannada, a south Indian language, for dyslexics. The study aimed at planning out a common remedial programme for different types of dyslexics and also to study its effect on improving letter and word recognition, reading comprehension, word analysis and synthesis abilities.

The study was carried out on six dyslexics who were selected out of 14, in such a way as to represent the neuropsychological strengths and weaknesses that are related to word recognition. The planning of the programme was done on the basis of the nature of dyslexia, errors committed by them, specific principles for teaching reading to dyslexics and also the salient features of the script of Kannada language.

The programme was tried out on the selected cases with a single case pre-test post-test design. The data was analysed in each individual case separately.

The programme was found to be effective in improving the accuracy of letter and word recognition and also level of reading comprehension, but was less effective in improving the speed of recognition and word analysis only synthesis abilities.

DEVELOPMENT OF REMEDIAL READING PROGRAMME FOR DYSLEXICS OF KANNADA LANGUAGE

BACKGROUND

The extent to which dyslexia affects reading retardation is not only dependent on the degree and kinds of deficiency dyslexics are having but also on the nature of the language. This indicates the need for attempts to develop remedial reading programmes for dyslexics in each language separately. Hence an attempt was made in developing remedial reading material in Kannada, a South Indian language for dyslexics.

OBJECTIVES OF THE STUDY

The study had two broad objectives:

(a) To plan out a common remedial programme for different types of dyslexics.

(b) To study the effectiveness of the above programme in improving the speed and accuracy of Kannada word recognition in case of dyslexics.

SUBJECTS AND SELECTION CRITERIA

Fourteen dyslexics could be identified from among 550 children studying in grades III and IV of 11 primary schools located in and around Mysore city by using a set of criteria which will eliminate all the poor readers who were not actually dyslexics.

The assessment of neuropsychological processes which are related to word recognition revealed that all the dyslexics were inferior to non-dyslexic poor readers and normal readers in visual verbal association and some of them were poor in any one or more of visual skills or auditory skills or both and sometimes in none of them.

Out of these 14 only 6 dyslexics were chosen for the study because treatment had to be given individually and the dyslexics were scattered in different schools. But, still, the sample was made as representative as possible by taking different kinds of dyslexics who differed themselves in combinations of neuropsychological strengths and weaknesses. Thus there were two visual dyslexics (deficient in any one or more visual skills – visual discrimination, recall, recognition and memory for shapes in sequence), 3 auditory dyslexics (deficient in any one or more auditory skills – auditory discrimination, memory for digits in sequence, word analysis and synthesis), 1 auditory-visual dyslexic (deficiency in both visual and auditory skills).

METHOD

The reading error analysis with the help of a Kannada word recognition test (Ramaa, 1985) indicated that the dyslexics had not yet mastered all the letters of Kannada alphabet also Kagunitha (symbols representing different combinations of consonant and vowel sounds). In addition they had difficulty in word analysis and synthesis also. This indicated the need to teach letters of Kannada alphabet, Kagunitha and other accessory forms as well as word analysis and synthesis skills. This necessitated the writing of a series of lessons. The lessons were based on the relevant learning principles suggested by various authors like, Tansley (1967), Newton (1980), Richardson et al. (1971) and Stauffer (1951). Thus the principles like over-learning, repetition with novelty, opportunity to generalize, help in overcoming specific difficulties, familiarity of words used, clarifying sensory experiences, consistency and regularity of treatment, active participation, meaningfulness, multisensory attack supported by spoken language, mnemonics and verbalization,

scope for success, segmentation of the task as well as a therapeutic approach were kept in mind.

Planning of the remedial programme was also based on the salient features of the script of Kannada language. In Kannada alphabets almost all the distinct sounds of Kannada language are represented by distinct symbols. One important advantage of such a system is that it is possible to coin a number of different words inspite of its complexity to learn with a given set of letters so that sufficient practice can be given to learn them adequately.

Thus, the planning of remedial programme was based on the neuro-psychological strengths and weaknesses of the dyslexics, kinds of reading errors committed by them, relevant learning principles as well as on the salient features of the script of Kannada language.

The lessons had the following characteristics:

1. Each lesson had two specific objectives:
    (a) Providing opportunities to establish association between particular grapheme and phoneme.
    (b) Giving practice in analysis and synthesis of particular words.
2. Each lesson except the first one introduced only one grapheme at a time; the first lesson had two letters to be learnt.
3. The order of teaching graphemes does not follow the conventional sequence. Teaching of low frequency letters sometimes follows that of teaching Kagunitha and other accessory forms.

4. Each lesson includes almost all the possible words coined out of the graphemes taught in that lesson, as well as those in previous lessons. The number of words in each lesson may vary from 2 to 25. Thus, there was a provision for cumulative learning and practice.
5. The lessons were arranged in a particular order, which allowed revision and evaluation of the previous learning as well as practice for the present as learning. So, the lessons should be taught in the same sequence.
6. By learning only one new letter, the child could read many words in every lesson. Thus, the motivation of the child could be maintained at a higher level.
7. If the child could read the first word of any lesson on his own, it suggested that, that lesson need not be taught through special efforts. Thus, the material helps in diagnostic teaching.
8. The important feature was that the lessons neither followed an alphabetic approach nor a whole word approach completely. It followed an eclectic approach.
9. The lessons were to be taught individually and allowed each child to learn at his own pace.

After the lessons were written as above, the procedure for making use of them for remedial purposes was also outlined by keeping in mind the same factors which formed the basis for the lessons.

In order to meet the second objective an experiment was conducted with a single case pre-test – post-test design as the group was heterogeneous in terms of neuropsychological strengths and weaknesses and as it was found difficult to get controls. Though, the main focus of the study was to find out the effectiveness of the

remedial programme in improving the speed and accuracy of word recognition, incidentally, it was also attempted to see its effectiveness in improving the speed and accuracy of letter recognition, level of reading comprehension, word analysis and synthesis abilities.

The whole period of treatment reacquired 16 sessions of one hour in case of visual and auditory dyslexics and 24 sessions of one hour in case of auditory-visual dyslexic.

The pre-test – post-test observations on the criterion variables were compared in each individual case with respect to gain in scores, reduction in different kinds of reading errors and saving in time.

OBSERVATIONS OF THE STUDY

1. There was considerable improvement in the accuracy of letter and word recognition after the remedial programme among all the dyslexics, irrespective of their initial levels in these two variables and was almost close to the mastery level.
2. Though, majority of the dyslexics showed improvement in the rate of letter and word recognition they were still far below that of normal readers of the same grade.
3. There was no considerable reduction in the frequency of letter substitution errors with visual, auditory or auditory-visual similarity between stimulus and response letters.
4. In almost all the dyslexics the level of reading comprehension was improved.
5. The level of word analysis remains constant and there was only a slight improvement in word synthesis even after remediation.

CONCLUSIONS

On basis of above observations following tentative conclusions can be drawn:

1. The programme is effective in improving the word recognition among dyslexics with different levels of neuropsychological strengths and weaknesses even without attempting to develop those abilities. Thus, is of immense help to regular classroom teachers.
2. Remedial reading materials for dyslexics which will be developed on similar lines among other languages which are phonetic in nature will also be effective.
3. Modifications in the programme are needed to improve the speed of letter and word recognition. Supplementary activities like exposure of words for a brief period through tachistoscope with some motivational input may be effective in this line.
4. The reason for the ineffectiveness of the programme in developing word analysis and synthesis abilities may be due to the mode of giving practice and that of testing. Visual analysis and closure which were there during practice were absent during testing. Thus, if word analysis and synthesis abilities have to be developed practice should be given in analysing and synthesizing the words presented auditorily in addition to visual cues.
5. The difficulty in reading comprehension is secondary to the difficulty in word recognition among dyslexics.
6. The difficulty in mastering letters which are having auditory and/or visual similarity with other set of letters and also slowness in recognising letters even after the remediation indicate difficulty not only in visual-verbal association but also in retrieval among dyslexics.

ABSTRACTS

British Psychological Society
Developmental Psychology Section
Annual Conference
Cambridge University
13th-16th September, 1991

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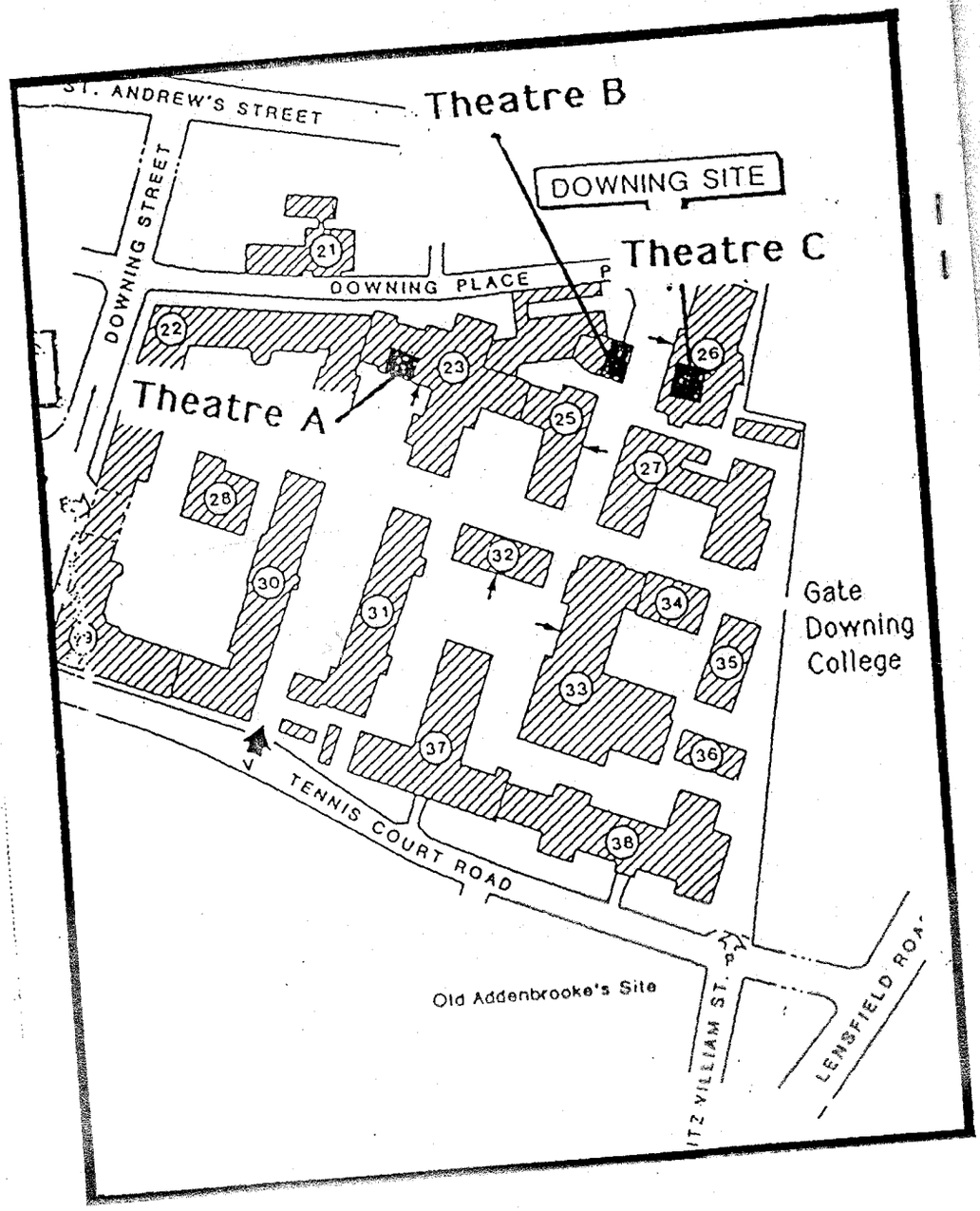

PROGRAMME

British Psychological Society
Developmental Psychology Section
Annual Conference
Cambridge University
13th-16th September, 1991

FRIDAY

6.00 p.m.....	Wine reception.
8.30 p.m.....	Invited address by Peter Bryant.

SATURDAY

12.00. noon.....	Invited address by Andy Clark
6.00 p.m.....	Section Annual General Meeting
6.00-7.30 p.m...	Sherry Reception
7.30 p.m.....	Gala Dinner
9.00 p.m. -12.00.	Band and Disco

SUNDAY

6.00 p. m.....	Invited address by Renée Baillargeon
8.30-10.00 p.m.	Wine reception

MONDAY

12.00 noon.....	Invited address by Martin Braine

SEQUENTIAL MEMORY AND LOGICO-MATHEMATICAL STRUCTURE AMONG DYSCALCULICS*

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ABSTRACT

The paper is about a study which was conducted with the intention to test the hypotheses whether the dyscalculics who were normal in reading and writing are deficient in the specific **Neuropsychologicl Processes**-*Memory for Auditoraly Presented Digits in Sequence, Memory for Shapes in Sequence* and also in the different Components of **Logico-Mathematical Structure**-*Seriation, Conservation, and Classification*. It was also further attempted to verify whether such children demonstrate different patterns of deficiencies in the above mentioned cognitive abilities. The qualitative analysis of the data clearly indicated that the dyscalculics of the study were significantly poor in both the types of sequential memory, however more deficient in recalling auditorily presented material than in visually input. It was noticed in the study that though there was slight variation with reference to different dimensions\aspects of the task-*length, area, volume,* in the case of **Seriation**, *number, length, area, volume, mass*, in the case of **Conservation**, within the group, there was a definite lag in the development of these specific cognitive abilities. **Categorisation of numbers, symbols and geometric shapes** in terms of *number of digits, odd and even numbers, ascending and descending orders, the extent of shaded area* were difficult to the dyscalculics even during their grade IV of primary school. The results are discussed in the light of the findings of the previous studies. The educational implications are also indicated.

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* Based on Ramaa, S. "Study of Neuropsychological Processes and Logico-Mathematical Structure Among Dyscalculics", Unpublished Project Report, ERIC(NCERT), New Delhi, India, 1990.

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Title: Innateness, Intersubjectivity and Knowledge: Between Behaviour and Cognition in Infancy

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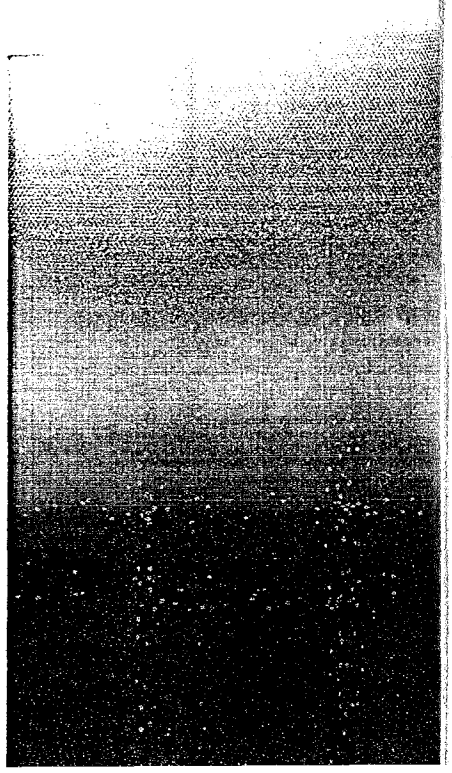
This paper examines the value of approaches which focus on behaviour as indicative of competence. These include ethological approaches emphasising phylogenetic adaptations in social behaviour, nativist approaches within developmental psychology emphasising innate social knowledge and intersub-jectivity, and social constructionist approaches emphasising knowledge constructed through social contexts. All these approaches are problematic in some ways; nonetheless they force us to reexamine what we mean by knowledge and by competent and purposeful behaviour. The gulf between reported behavioural complexity and socio-cognitive poverty in infancy is usually dealt with by the adoption of cognitivist or computational metaphors in developmental psychology which significantly underplay the relevance of behaviour to cognition. It is argued that a resolution between approaches which takes infant behaviour seriously, is the only way of making sense of infant cognition.



Volume 3 1994

Studies in Educational Theory and Practice

Journal of the Regional College of Education, Mysore

REGIONAL COLLEGE OF EDUCATION
MYSORE - 570 006
[NATIONAL COUNCIL OF EDUCATIONAL RESEARCH
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Printed at **READYPRINT**, Mysore - 570 0(

CONTENTS

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*Neuropsychological Processes and Logico - Mathematical Structure among Dyscalculics.**

S.RAMAA

ABSTRACT *The neuropsychological processes-visual sequential memory and auditory sequential memory and also different components of Logico-Mathematical structure-seriation, conservation and classification were assessed among 15 dyscalculics. The analysis revealed that dyscalculics have significant deficiency in these skills. The educational implications of the findings are discussed.*

Introduction

Dyscalulia is a type of learning disability. Learning disability referes to a retardation, disorder or delayed development in any one or more of the processes of speech, language, reading, spelling, writing or arithmetic. These problems are due to disorder or deficiency in any one or more of the basic psychological processes involved in understanding or in using spoken or written language. They do not include learning problems which are due primarily to visual, hearing or motor handicpas, mental retardation, emotional disturbance or to adverse environmental factors.

Herman (1959) proposed that the term acalculia should be used to denote inability to perform calculations: Dyscalculia is a form of acalculia which involves a partial inability to perform calculations.

* An abstract of this paper was presented in the National conference organized by University of Cambridge, Cambridge, U.K., 1991

Some investigators conceive dyscalculia as mathematical disability where as some other consider it as arithmetic disability. But the behavioural symptoms exhibited by children with mathematical disability are different from that of arithmetic disability. Chalffant and Schaffelin (1969) have observed that the child with a mathematical disability might have difficulty ".... in handling the operations, interrelations and abstractions of numbers, or the structure, measurement and transformation of space configurations". The child with an arithmetic disability might have trouble ".... in reading or writing isolated numerals, reading and writing numbers whose names are not written in the way they are spoken (twenty-one-21, not 201), recongnizing the catagorical structure of numbers(units, tens, hundreds, thousands, etc.), and doing computational operations".

In the study the term dyscalculia is used in a restricted sense indicating arithmetic disability. More specifically it denotes predominat difficulty in

a) Number concept-counting and using simple numbers to represent quantity.

b) Arithmetic processes-adding, substracting, multiplying and dividing, and,

c) Arithmetic reasoning-applying basic arithmetic processes in personal and social usage of problem solving (Valett,1975).

On the basis of a thorough review of the studies in the area of the education of the handicapped Robert and Anne Marie (1981) pointed out that the past few years have been marked by a growing awareness of the special needs of learning disabled (LD) children with respect to mathematics education. They quoted the observation of an investigation conducted by Cawley, Fitzmaurice.Goodstein,Lepore, Sedlak and Althaus (1979) about the characteristic features of LD children. In the study different deficit patterns were noticed among LD children implying the necessity for different approaches of instruction for the LD children, both from content perspectives and methodological considerations. Considerable amount of work has been done to find out how deviant LD pupils generally are from their normal mates in the relevant neuropsychological processes and cognitive development in terms of Piagetian tasks.

It was consistently showed in the previous studies that dyscalculics have severe deficiency in certain neuropsychologiccal processes like recall of the items presented through both the modalities- visual and auditory in a particular sequence (Webstar 1979 & 1980). It was also noticed that dyscalculics demonstrate a deficient logico-mathematical structure-Conservation, Seriation and Class (Clarke and Chadwick, 1979; Kingma, 1984, Derr, 1985, Deborah, James and Mark,1986). However from the reports of those studies it is not clear whether the samples studied consisted of children with dyscalculia only or

whether they had other types of learning disabilities also. Hardly there are any attempts to identify differentiating factors among them. There is a real need for initiating and continuing studies in this direction in order to understand the true nature of dyscalculia which in turn form basis for providing remedial instruction to children with such problems.

The present study is one such attempt in that direction. The purpose was to find out whether dyscalculics who were normal in reading and writing are deficient in the above processes in comparison with normal children, and also to see whether there are any variations among themselves with reference to these variables.

Objectives:

To find out whether the children with dyscalculia are deficient in the specific Neuropsychological processes- Visual sequential memory (Memory for shapes in sequence) and Auditory sequential memory (Memory for auditorily presented digits) and in the different components of Logico-mathematical structure- Seriation, Conservation and Classification.

-To find out whether dyscalculics who are normal in reading and writing demonstrate different patterns of deficiencies in the cognitive abilities assessed.

Sample:

The study included 15 dyscalculics who were normal in reading and writing, and were studying in II through IV grades of primary schools. In order to identify the dyscalculics the following set of criteria were specified:

* Normal in Speed and Accuracy of Reading Kannada Words (Kannada Oral Reading Test, Jaya Bai,1958);

* Normal in Reading Comprehension (Reading Comprehension Test in Kannada, Ramaa, 1985);

* Normal in Writing the words Dictated (Kannada Oral Reading Test, Jaya Bai, 1958);

* Normal in Writing the Passage Dictated (Reading Comprehension Test, Ramaa,1985);

* Consistent Failure even in the most Basic Skills of Arithmetic, (Arithmetic Diagnostic Test for Primary School Children, Ramaa,1990);

The above set of criteria were applied to 308 children who were considered as normal in reading and writing but poor in arthimetic by their teachers. Only 15 of them satisfied all the criteria specified and thus were considered as dyscalculics. There were 9 boys

and 6 girls altogether. For details of identification procedure see Ramaa (1990) and (1992).

Methodology:

The Memory for shapes in Sequence and the Memory for Auditoraly Presented Digits in Sequence were assessed through Visual sequential memory and Auditory sequential memory subtests of Illinois Tests of Psycholinguistic Abilities (Kirk and Mccarthy,1987). The tests were administered according to the procedure recommended into psycholinguistic age (PA) for the purpose of analysis and interpretation. The difference between chronological age (CA) and PA for visual sequential memory (VSM), CA and PA for auditory sequential memory (ASM) as well as difference between psycholinguistic ages for VSM & ASM were computed.

The logico-mathematical structure among the dyscalculics of the study was assessed by administering the Metric Relations and Conservation subtests of Mysore Cognitive Status (MCDST) (Padmini and Nayar- yet to published) and the Classification test developed by the investigator. The Metric Relations subtest assesses seriation in length, area, volume, equidistant point location and distance estimation. The Conservation subtest assesses Judgment of Invariance of numbers, area, length, mass and liquid. (For details see Ramaa, 1990). The raw scores were retained as such and the data was analysed qualitatively.

The ability of the dyscalculics uo classify the numbers/ set of numbers/ geometric shapes in terms of certain characteristic features like-number of digits, odd and even, ascending and descending order and number of shaded areas, and to explain the basis for classification test developed by the investigator. The test was constructed to assess the ability of primary school children I through IV to classify:

i) the given numbers writuen on cards separately according to the number of digits (1-4),

ii) the sets of signs(+) written on cards into two groups in terms of the number of signs-odd or even,

iii) the given series of numbers written on cards into two groups depending upon the order-ascending or descending,

iv) the geometric shapes-square, circle, and rhombus into four groups on the basis of the extent of the shaded area- whole, 1/4, 1/2 and 3/4 parts.

The cards were presented to the children in jumbled order. They were asked to classify them into different groups. No clue was given to the children as far as the criterion of

the classification are concerned. When right response was showed the child was asked to tell the reason behind the classification.

Ability to classify and to explain the reason were recorded and considered separately. For details see Ramaa (1990).

Discussion of the results

Sequential memory of dyscalculics:

From the analysis of the data related to sequential memory it was understood that the psycholiguistic ages for VSM and ASM were much below that of CA in all the dyscalculics of the study. The difference between CA and PA for VSM ranged from 0-5 to 5-1 years whereas the difference between CA and PA for ASM ranged from 2.0 to 6.1 years indicating greater deficiency in ASM than VSM. In only one case the PA for VSM was equal to PA for ASM. In five cases out of 15, the PA for ASM was greater than that for VSM. The mean difference was 1.1 years. In the remaining 9 cases the PA for VSM was more than that for ASM by an average of 1.6 years. The finding of the study is in consensus with the findings of the earlier studies that the performance of mathematically deficient subjects were significantly poorer than mathematically proficient children in sequential memory and they recalled more information with the visual presentation (Webster 1979, 1980).

Through analysis of the types of errors committed by the dyscalculics of the present study in arithmetic the investigator noticed that the subjects demonstrated significant difficulty in sequential reproduction of the numbers and also reversed digits within the given numbers. They can be attributed to their deficiency in sequential memory. But this arises one important question whether reading and writing skills are independent of auditory and visual sequential memories, as the dyscalculics of the present were normal in reading and writing. This question can be answered in terms of the basic difference between learning letters and words of a particular language and learning of numbers. Adequacy in Visual-verbal association (grapheme-phoneme correspondence), word analysis and synthesis are very much essential for learning letters and words. The effect of deficiency in sequential memory in learning letters and words may be reduced by the strength in the above mentioned three essential skills. Whereas the deficiency in visual-verbal association, word analysis and synthesis lead to dyslexia (Ramaa, 1985,1993).

In contrast to learning letters and words learning of numbers is predominantly determined by memorizing spatial (visual) and temporal (auditory) sequences of numbers. The

numbers and the digits within the numbers should be learnt in the established sequence only; there is no alternative. Once the child understands place value he can indpendently read and write multidigit numbers. Even then sequential memory is a must for functional use of numbers. This finding is having very important implication for teaching arithmetic to dyscalculics. The approach should compensate for the deficiency in sequential memory.

Metric relations among dyscalculics:

It is interesting to note that majority of dyscalculics of the present study experienced difficulty in seriating the objects dolls and sticks height-wise and length - wise respectively.

They failed to seriate length-wise in more number of cases. This may be because in the case of dolls, which had to be seriated height-wise, the base/reference point is fixed. They had to compare the difference only at the top level. But in the case of sticks they themselves had to fix up a reference point, that is, arrange the sticks in such a way that one end of all of them must be linear and compare the length at the other end. This shows that many of the dyscalculics do not know how to estimate the length and seriate the objects in terms of length even at the age of 9.0+ years.

Majority of the dyscalculics could seriate the objects in terms of area and volume. Only 2 children out of 15 had difficulty in those tasks. This suggests that dyscalculics of even 7 years 4 months of age are able to seriate the objects area-wise and volume-wise.

Only 2 dyscalculics could identify the equidistant point within the given limits (mid point) and around a given point. These two tasks are loaded with spatial relations, in which dyscalculics were utterly failed.

Distance estimation also involves spatial relations. The raw scores indicate that all the children except 2 totally failed in the tasks.

In fact seriation of objects in terms of different dimensions-length, area and volume - involves the estimation of the extent of space occupied by an object and judging whether it is relatively more or less compared to the other objects on any one or more dimensions. The task of equidistant point location and distance estimation in a way are reverse processes wherein the difference in terms of distance (linear) between objects should be narrowed down to as minimum as possible. The dyscalculics of the present study experience serious difficulty in dealing with both the kinds of situations especially when only one dimension-length or distance -was involved.

The study by Rourke and Finlayson (1978) also revealed that the children who were normal in reading and spelling and markedly impaired in arithmetic performance were inferior to children with arithmetic performance better than them in visual-spatial abilities.

From the above findings it can be inferred that the difficulty of the dyscalculics in dealing with concrete situations would definetely influence their performance in tasks dealing with numbers which are relatively more abstract in nature.

Conservation ability among dyscalculics:

The analysis of the data related to tasks on conservation revealed the following:

a) As far as judgment of invariance of number is concerned only a few were conservers even at the age of 8-6 to 9.0 years.

b) There were only a few conservers with reference to length. Whereas the number of children who were in transition and non-conservation were almost same.

c) Almost all the dyscalculics of the study were non-conservers with reference to judgment of invariance of mass and liquid are concerned.

The findings of the present study fully conforms with that of the earlier studies. It is very clear that dyscaclulics attain concrete operational stage considerably at a very late age compared to normal children.

Teaching of Mathematics involves concretization of the situation. When the children fail to operate at the concrete stage itself, they will not be benefited by the mathematics instruction through mere concretization.

This suggests several alternatives:

1) Waiting till they attain concrete operational stage.

2) Developing arithmetic readiness- classfication, correspondence, conservation, reversibility and seriation (Childs, 1981) through specialised programme.

3) Teaching arithmetic through such procedures which would foster cognitive development and develop arithmetic skills simultaneously.

Among the 3 alternatives, third procedure seems to be most appropriate as it serves in reducing the gap betwen normal children and dyscalculics.

Classification ability among dyscalculics:

From the analysis of the data related to categorization of numbers, symbols, and geometric shapes in terms of certain distinct features the following things were noticed.

Some dyscalculics even at the grade IV experience difficulty in verbalizing the critirion adopted by them for calssification of numbers depending upon the number of digits.

Only 50% of the dyscalculics of grade IV could classify the set of signs in terms of odd and even numbers. Only 4 out of 5 could verbalize the reason.

In case of classification of numbers based on ascending and descending order also only 50% of the dyscalculics were successful out of which only 30% could explain the bais of classification.

Majority of the dyscalculics (7/10) of grade IV were successful in classifying the geometric shapes into 4 categories depending upon the number of shaded areas, out of those 7 only 6 could explain the criterion for classification.

It was noticed that the dyscalculics of grades II and III could classify the numbers in terms of number of digits but failed in all the other calssificatory tasks.

Conclusion:

From the observations made in the study it is clear that it is not possible to identify subcategories among dyscalculics in terms of sequential memory, deficiencies and delays in attaining certain capabilities indicative of concrete operational stage, as almost all of them had deficiency/delay in them to considerable extent.

The remedial arithmetic programme for dyscalculics should be developed keeping in mind the specific deficiencies among them in the relevent aspects of functioning. The attempt should be made to enable them to learn arithmetic skills in spite of the deficiencies in the underlying cognitive processes. Due weightage should also be given for development of metacognition skills among them.

References

Cawley J.F. Fitz-Maurioo A.M. Goodstein H.A.,Lepore A. Sedlak R.A.and Althaus V. "Project Math, levels I-IV", Tulsa, Okla; Educational Progress Corporation, 1976-77.

Chalffant J.C. and Schefelin M.A. "Central Processing Dysfunctions in Children", A Review of Research, U.S.Government Printing Office, Washington, D.C.1969.

Childs Ronald E. "Developing Arithmetic Readiness of Young EMR Children", Paiget applied , Pointer, 1981 (Fal) vol.26(1), 19-21.

Clarke Nancy and Chadwick Mariana, "Operative and Figurative aspects of thinking in children with Learning Problems in Mathematics and Reading Span", Revista Lationo dmericana depsicologia, 1979, Vol.II(2), 261-272.

Deborah L.S.James D. McKinney and Mask I. Appillbaum, "Longitudinal Development of Conservation Skills in Learning Disabled Children", Journal of Learning Disabilities, May 1986, Vol. 19(5) 302-307.

Derr Alice M., "Conservation and Mathematics Achievement in the Learning Disabled Child", Journal of Learning Disabilites, 1985 (June-July) Vol.18(6), 33o-336.

Herman K., "Reading Disability", Charles C. Thomas, Springfield, Illinois, 1959.

JayaBai, "Oral Reading Test in Kannada", Unpublished M.Ed. Dissertation, University of Mysore, 1958.

Kingma Johannes, "Traditional Intelligence, Piagetian tasks, and Initial Arithmetic in Kindergarten and Primary School Grade One", Journal of General Psychology, 1984 (Sept.).Vol.145(1), 49-60).

Kirk and Maccarthy, "Illinois Tests of Psycholinguistic Abilities", University of Illinois, Illinois, 1967.

Padmini T. and Nayar P.R. "Mysore Cognitive Development Status Test", University of Mysore, yet to be published.

Ramaa S."Diagnosis and Remediation of Dyslexia- an attempt", Ph.D.Thesis, University of Mysore, 1985.

Ramaa S."Study of Neuropsychological Processees and Logico- mathematical Structure among Dyscalculics" Unpublished Project Report, ERIC (NCERT), 1990.

Ramaa S. "Hand Book on Learning Disabilities", Regional College of Education (NCERT), Mysore, 1992.

Ramaa S. "Diagnosis and Remediation of Dyslexia: An Empirical Study in Kannada- an Indian Language", Vidyasagar Printing Press and Publishing House, Mysore, 1993.

Rourke P.Byron, "Reading, spelling, Arithmetic, Disabilities- A Neuropsychologic Perspective", In Helmer R. Myklebust (Editor), Progress i:. Learning Disabilities, vo.IV,1978.

Webster, Raymon E., "Short-term Memory in Mathematics-Proficient and Mathematics Disabled Students", Journal of Educational Research, 1978 (May/June). Vol.72(5), 277-283.

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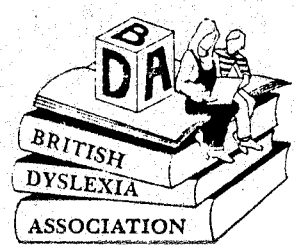

'MEETING THE CHALLENGE'

THE SECOND INTERNATIONAL CONFERENCE
OF THE
BRITISH DYSLEXIA ASSOCIATION
IN CONJUNCTION WITH THE EUROPEAN DYSLEXIA ASSOCIATION

Oxford Polytechnic
2nd April - 5th April 1991

CONFERENCE PROGRAMME

GUIDE TO INDICATE PAGE AND DAY

LIST OF SPEAKERS IN ALPHABETICAL ORDER

Keynote Speakers are in Bold Type

Presenting Speakers are underscored

The International Section from the European Dyslexia Association follows this list

Lloyd Lecture Theatre

Lindsay Peer
Dept. of Education, University of Nottingham
Language and development of cognitive competences of bilingual dyslexics.
Chair: N. Goulandris

Seminar Room A101

Janet Wright
National Hospital's College of Speech Sciences
Working together; speech therapists and teachers
Chair: Maggie Snowling

Lecture Theatre H101

Ramaa Subbiah
Non-categoric approach to teaching reading and writing to dyslexics
Chair Jo Matty

Seminar Room LL313

Jeanne Riley
Fairley House School, London.
The use of tape recorders to develop speaking and listening skills
Chair: Colin Lane

Session Ends 4.50 p.m.

7.30 p.m. Conference Dinner

Coaches will leave the Polytechnic at 6.30 p.m. proceeding to the Randolph Hotel.

Thursday 4th April

8.45 a.m. Options

Main Hall

Symposium: led by Jim Stevenson, University of Surrey.others contributing :-
John DeFries, Dick Olson, Dorothy Bishop, John Rack.
Subject:- Genetic studies of reading disability.

Main lecture Theatre

Prof. Ann Ryan
Dept. of Special Education, University of St.Thomas Saint Paul, Minnesota, U.S.A.
The changing self perceptions and expectations of college students with dyslexia.
Chair: Allan Giles

Lloyd Lecture Theatre

Gianetta Corley, London
Processing words and pictures, a comparison of cognitive differences between children with specific learning difficulties, and those with partial sight.
Chair: Michael Thomson.

Seminar Room A101

Maryrose Crossman
Mark College, Somerset.
A developmental approach to social and interpersonal skills in adolescents.
Chair: Gerald Hales.

10

Non-Categorical Approach to Teach Reading to Dyslexic and Educable Mentally Retarded Children

Dr. Ramaa. S.*

Introduction

Theoretically, students classified as learning disabled (LD), educable mentally retarded (EMR) and emotionally disturbed (ED) have measurably different behavioural characteristics. An educable mentally retarded student has a lower IQ (range 50-75) with academic achievement rate and social development rate substantially below that of his or her peers. A learning disabled student has an average or above-average IQ test performance showing unusual scatter and academic achievement deficits in specific areas as compared with overall assessed aptitude. An emotionally disturbed student has conduct/personality problems that may or may not be accompanied by academic deficits.

In reality, however, there are numerous similarities among the three groups along the dimensions of under

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achievement, personal adjustment, and adaptive behaviour. Researchers over the past two decades have been permeated with evidences indicating that psychometric categorisation of students is limited both in reality and in practical applicability. Kaufman (1981) using the Wechsler Intelligence Scale for Children (Revised) found that students labelled as learning, disabled, educable mentally retarded, emotionally disturbed, reading disabled and normal had similar verbal/performance discrepancies. A number of researchers have observed that children classified as learning, disabled, educable mentally retarded or emotionally disturbed share common academic difficulties, particularly in the area of readings (Kirk, 1964; Stone & Rowley, 1964; Zax, Cowen, Rappaport, Beach & Laird, 1968; Stennett, 1969; Weinstein, 1969; Cegelka & Cegelka, 1970; Larsen & Hammill, 1975).

Morsink (1984) analysed the recommendations of specialists in the fields of learning disability, EMR and emotionally disturbed through a review of major texts written between 1974 and 1984. The analysis revealed that the recommendations of the specialists were focussed on methods that matched children's behaviours rather than their categories. In other words, the specialists were of the opinion that mildly handicapped students in any category may have academic deficits, and if they do, they should be taught basic skills. According to them children in any of these categories need more concrete materials, more practice and more specific feedback on their performances. In fact, evidences from studies on normal learners (Walberg, 1984), non-classified students with low socio-economic backgrounds (Stevens & Rosenshine, 1981) and students who have unlabelled reading disabilities (Gettinger, 1982) as well as the evidences drawn from research syntheses on mildly handicapped students both in regular classes (Larrivee, 1982; Wang & Birch. 1984 (a). 1984 (b) and

in special classes (Jenkins & Mayhall, 1976; Sindelar & Deno, 1978) suggest certain common elements of instruction for different categories of children. The effective remedial programme, for instance, for learning disabled, educable mentally retarded, and emotionally disturbed should include teacher-directed instruction, extensive opportunities for active academic responding with feedback, contingent reinforcement for appropriate behaviour and instruction adapted to individual needs. Invariably, teacher-directed instruction is identified as instruction that is planned and presented by the teacher (Morsink, Thomas & Smith-Devis, 1987). It is academically focussed, systematic, and presented in sequential order of difficulty, beginning with students' present level of achievement. It is characterized by teacher modelling, asking low-order quesuons and presentation in group setting (Gettinger, 1982) or in tutorial mode (Jenkins & Mayhall, 1976). Teacher-directed instruction is contrasted with instructions that consists of brief teacher responses to the questions raised by learners while working independently.

Direct instruction, a specific example of teacher directed instruction, has been found effective across the three categories (Barrott, 1965; Isaacs & Stannett, 1980; Stephens, 1980; Cotton & Savard, 1982 :Englemann & Carnine, 1982; Epstein & Cullinan, 1982).

Active academic responding is defined as a measurable response on the part of a learner-written or manipulative or verbal or gestural or their combinations that follows a teacher's question or request for performance (Morsink, Thomas & Smith Devis, 1987). It may include independent work sheet or work-book completion, provided that this activitiy is closely and continuously supervised. It has been shown that middly handicapped students require more learn-

ing time, more trials to criterion and more practice than normal learners (Fisher & Zeaman, 1973; Heron & Skinner, 1981;). It was also shown that either one-to-one instruction with a teacher or peer, or verbally interactive small-group instruction can increase students opportunities for active responding for active responding (Gettinger, 1982; Kaufman et al; 1986). The important element in this context is the provision of controlled practice with positive teacher or peer tutor feedback (Cox & Wilson, 1981; Gable, Hendrickson, Shores & Young, 1983; Wang Birch, 1984) rather than smaller class size.

Contingent reinforcement is related to behaviour management while teacher feedback focuses on academic performance. Academic feedback is specific and may be used either to confirm or correct student's accuracy while contingent reinforcement is positive rather then corrective. Contingent reinforcement includes clear statements of rules, planned ignoring of inappropriate behaviour and positive reinforcement of alternative (acceptable) behaviour demonstrated by the student (Morsink, Thomas and Smith-Davis, 1987).

The cluster of methods known as adaptive instruction includes those which match individual student's need for repeated practice, lower reading levels or simplified language and specific learning strategies that enable students to monitor their understanding of print materials.

Available evidences from researches on effective methods of teaching EMR (Algozzine, 1984), emotionally disturbed (Valcante, 1984) and learning disabled students. Morsink, Branscum and Boone, 1984) suggest that the same methods have been used successfully with students in all the three categories. Moreover, it has been observed by

some of the investigators that the procedure used was effective for some students but not for others within the same samples studied. However, research reports do not indicate whether the programmes tried out by the investigators included all the elements recommended for teaching of EMR, learning disabled and emotionally disturbed.

Based upon the above discussion on the elements of effective remedial programme drawn from the recommendations of the various investigators it can be hypothesised that the remedial programme which is effective in any one of the three categories is also effective in the other categories. It is also turn, as evident from the above studies, that a single procedure may not be effective in the case of all the children of a particular category. The Main concern, in this context is to develop common procedures for different subcategories of a particular kind of children and try out its effectiveness in the case of children belonging to other categories also. Such attempts are particularly of practical importance. The teachers of Normal schools, sometimes are not in a position to differentiate between a LD and an EMR. Even if they differentiate they may not be in a position to provide differential programme for them, due to various practical difficulties. This is especially true in overcrowded classes. Under these circumstances a common strategy of teaching seems to be very economical in terms of time and energy. In addition, they also contribute to Integrated Education for the Disabled in a true sense of the term, as there would be adequate scope for academic integration. The Remedial Reading Programme developed by Ramaa (1985) includes majority of the elements which are assumed to be responsible for the effectiveness of remedial programmes and was quite effective in improving Kannada reading performance among different kinds of dyslexics. The article discusses about a study conducted

by Khader and Ramaa (1988) where in the programme developed by Ramaa (1985) for dyslexics was tried out on a group of EMR children te see its effectiveness in improving performance.

Salient Features of the Remedial Reading Programme

The remedial reading programme which was tried out on EMR children was originally developed keeping in mind the requirements of different types of dyslexic children (Ramaa, 1985). It was primarily planned to overcome the common types of errors committed by dyslexics while recognizing the Kannada words. While doing so, the distinct features of the script of Kannada language were kept in mind. In audition, the specific neurological deficits underlying different types of dyslexia was also given due weightage. The lessons of the programme were written by incorporating the relevant learning principles suggested by various authors like Tansley (1967). Newton (1980), Richardson, et. al. (1971) and Stauffer (1951). Thus the important principles like over-learning, repetition with novelty, opportunity to generalize, help in overcoming specific difficulties, familiarity of words used, clarifying sensory experiences, consistency and regularity of treatment, active participation, meaningfulness, multisensory attack supported by spoken language, mnemonics and verbalization, scope for success, segmentation of the task as well as a therapeutic approach were considered.

The space is too restricted to provide a detailed description of the programme. Mainly the programme was a highly structured one, though there was sufficient scope for flexibility according to the specific needs of the children. The objectives of each lesson were clearly spelt out. It adopted diagnostic-prescriptive approach. Lot of scope was there

for revision, continuous evaluation and cumulative learning. The lessons had the essential features of both an alphabetic approach and a whole word approach of teaching reading.

Objectives

—To assess the reading readiness level of EMR children with 6 and more than 6 years of mental age, and to compare them with normal children of same age group.

—To identify whether the reading readiness level of EMR children is related to their Chronological Age (CA), Mental Age (MA) and/or IQ and

—To validate the effectiveness of the remedial reading programme developed for dyslexics of Kannada language in improving the reading performance among EMR children.

Methodology

The EMR children who were involved in the study had an IQ ranging from 55 to 75 with a Mental Age of 6-9 years, as measured through the Verbal Intelligence Scale (Binet and Kamat, Kannada version, standardised for Indian Population, 1960). The sample size differed for different objectives.

In order to operationalize the objective No. 1 of the study, the Reading Readiness Test developed by Devaki (1978) was administered to 58 EMR childen whose mental age was 6 years and above. The test has three sub tests-vocabulary, visual discrimination and auditory discrimination. The test was administered individually and the obtained raw score was analysed.

The reading readiness level of EMR children was compared with that of the normal children with the objective to verify the hypothesis that EMR children of mental age

6 years and above do not differ from normal children of same mental age in the reading readiness level. Performances of the groups were compared on total test as well as sub tests by using t-test.

Chi-squares were calculated to identify whether the reading readiness level was independent of chronological age, mental age and/or IQ. As considerable degree of relationship was observed between mental age and reading readiness level coefficient of correlation was computed for these two variables.

The effectiveness of the remedial reading programme developed for dyslexics in improving the Kannada reading performance among EMR children with a mental age of 6 years and above was ascertained by using an experimental design. In order to control factors like maturation and school programmes which may influence the dependent variables and also to ascertain the improvement in reading due to the remedial programme, a pre-test post-test control group design was used. There were 10 children in both the groups who were matched on sex, age, type of school attending, grade in which studying, mental age, readiness level, level of academic performance as indicated by the teacher's opinion and informal testing by the investigators.

At the pre-test stage the dependent variables-level of letter recognition, speed and accuracy of word recognition and level of reading comprehension were assessed among both the groups (experimental and control) by individually administering the suitable tests. The mean performance of the groups on those tests were compared using t—test to verify the assumption that the groups do not differ from each other significantly. The results of the t—test showed that though the groups did not differ significantly on level

of letter recognition, word recognition and reading comprehension, they differed significantly on speed of word recognition. As it was practically impossible to have groups which were matched on so many relevant variables, the groups were retained with difference in one important variable. The group whose mean performance was low on all the tests was considered as the experimental group and the other group as control group.

The remedial treatment by using the programme developed for dyslexics (Ramaa, 1985) required 60-70 sessions of 45-60 minutes each for the EMR children. The children were allowed to learn at their own pace.

The data obtained through the above experimentation were analysed by using ANACOVA, the reason being, there was initial difference between the experimental and the control groups in one of the variables. The various errors committed by the children while recognising the words during pre-test and post-test were classified and the mean frequency of each type of error was compared between the groups on pre-tests and post-test and also between the tests within each group.

Discussion

It has been observed in the study that the EMR children of 6-7 years of mental age are inferior to normal children of 6-6. 6 years of chronological age in reading readiness level as a whole and in its sub-components vocabulary, auditory discrimination and visual discrimination. The study reveals that EMR of mental age 7-8 years are almost equal to normal children of 6-6.6 years of age in the total readiness level as well as in all the three subcomponents. The EMR children of mental age 6-7 years are found to be equal to normal children of 4-5 years of age, whereas EMR of

7-8 years of MA are found to be equal to normal children of 6.6 years of age. This suggests that the gap between the normal and EMR children decreases at a little higher age with reference to reading readiness as a whole and in its component skills. The implication is that EMR children will be ready for reading at the MA of 7-8 years and not earlier to that.

From the study it can be understood that the level of reading readiness among EMR children has moderate positive correlation with MA ($r=0.55$) and not with either CA or IQ. This finding is in line with the earlier findings (Morphett and Washburne, 1962).

The experiment conducted to verify the effectiveness of the remedial reading programme developed for dyslexics in the case of EMR children and the analysis of the data through ANACOVA revealed that the programme is quite effective in improving the level of letter recognition, speed and accuracy of word recognition and the level of reading comprehension in the case of the experimental group. In the case of conrol group there was no significant improvement. The findings are in congruance with earlier studies and suggest that any remedial programme which is effective in improving performance among learning disabled would be equally effective for EMR children. Morsink, Thomas and Smith Davis (1987) pointed out that the procedures which were successrully used across different categories of mildly handicapped children (EMR, Learning Disabled and Emotionally Disturbed) to improve their reading performance were actually failed to improve the same among all the children of a particular category. But this is not true in this study. The remedial programme that was tried out in the present study was effective in improving the reading performance among all the 10 EMR children involved.

It was noticed in the study that without any specific attempt to improve reading comprehension among the children of the experimental group, there was considerable improvement in it in comparison with the control group. This can be attributed to the improved efficiency in recognizing words as a result of remediation. This finding supports the view that attempts to improve the level of word recognition among the mildly handicapped children should proceed the training in comprehension (Palinscar and Brown, 1984).

The remedial reading programme tried out in the study was quite effective in reducing the different types of reading errors-letter substitution, kagunitha (symbols representing consonant + vowel combinations) substitution, word substitution, and sound blending errors among the children of the experimental group. The remedial programme was quite successful in reducing the similar kinds of errors among dyslexics also (Ramaa, 1985).

The finding that the remedial programme is equally effective even in the case of EMR children whose MA is 6-7 years but whose readiness level equal to that normal children of 4-5 years has important implications. It implies that EMR children of 6 years MA can be taught reading effectively by using the kind of remedial reading programme which was tried out in this study even in the absence of any prior reading readiness programme.

As the remedial reading programme tried out in the study is effective in the case of EMR children as well as dyslexics (Ramaa, 1985), it can be assumed that the programme may be effective in improving the reading proformance even in the case of slow learners, socially disadvantaged as well as children with emotional disturbance resulting in academic deficiency.

In general the findings of the present study support some of the theoretical assumptions and research findings related to remedial reading for mildly handicapped children. At the same time the study recommends improved methods of teaching reading to mentally retarded children. This helps in meaningful integration of differnt categories of mildly handicapped children for the purpose of teaching reading.

REFERENCES

Algozzine, B. (1984), "Where is Special education for students with high prevalence handicaps going ?", *Exceptional Children*, 51, 388-394.

Barrett, T.C. (1965) "The relationship between Measures of prereading visual discrimination and first grade reading achievement : A review of literature", *Reading Research Quarterly*, 1, 51-76.

Cegelka, J.A. and Cegelka, W.J. (1970) "A Review of Research : Reading and the Educable Mentally, Handicapped, *Exceptional Children*, 37, 187-260.

Cotton, K. and Savard, W. (1982) *Topic Summary Report - Direct instruction*. San Francisco, CA : Northwest Regional Education Laboratory.

Cox, L and Wilson, A. (1981) "A comparison of academic gains in reading among mildly LD students in three programme structures". *Reading improvement*, 18, 132-137.

Devaki, D. (1978) A readiness test in Kannada : Its development and standarization. Unpublished M.Sc. (Speech and Hearing) Dissertation, University of Mysore.

Engleman, S. and Carnine, D. (1982) *Theory of instruction : principles and applications*. New York : Irvington.

Epstein, M. and Cullinan, D. (1982) "Using social comparison procedures in educating behaviourally disordered pupils". *Behavioural Disorders*, 7, 219-224

Fisher, M.A. and Zeaman, D. (1973). "An attention-retention theory of retarded discrimination learning". In N.R. Ellis (Ed.) *The International Review of Research in Mental Retardation*. New York : Academic Press, 6, 171-257.

Gable, R. et al. (1983). "A comparison of teacher approval statements across categories of exceptionality, *Journal of Special Education Technology*, 6, 15-22.

Gettinger, M. (1982) "Effects of Learner ability and instructional modification on time needed for learning and retention". *Journal of educational Research*, 76, 392-369.

Heron, T. and Skinner, M. (1981), "Criteria for defining regular classroom as the least restrictive environment for learning disabled students", *Learning Disability Quarterly*, 4, 115-121.

Issacs, L. and Stennet, R. (1981). "The DISTAR reading programme in junior opportunity classes : Phase IV—positive results after three full years of instruction". *Special Education in Canada*, 54, 18-20.

Jenkins, J.R. and Mayhall, W.J. (1976) "Development and evaluation of a resource teacher programme. Exceptional Children, 43, 21-29. Kaufman, A.S. (1981) The WISC-R and learning disabilities : State of the art". *Journal of Learning Disabilities*, 14, 520-526.

Khader, M.A. and Ramaa, S. (1988) Improving the Kannada reading performance of educable mentally retarded children, ERIC (NCERT), Project Report, Regional College of Education, Mysore.

Kirk, S.A. and Johnson, G.O. (1951) *Education of the Retarded Child.* Boston : Hougiton, Mifflin.

Kirk, S.A. (1964) Research in Education, In M.A. Stevens and R. Heber (Eds.) *Mental Retardation,* Chicago. University of Chicago Press.

Larrivee, B. (1982) "Identifying teaching behaviours for Mainstreaming". *Teacher Education and Special Education*, 5, 2-6.

Larsen, S.C. and Hammill, D. (1975)—"The Relationship of selected visual perceptual abilities to school learning". *Journal of Special Education*, 9, 281-291.

Morphett, M.V. and Washburne, C. (1962) When should Childred begin to read ? In V.H. Noll and R.P. Noll (Eds.) : *Readings in Educational Psychology*, the MacMillan Co., New York.

Morsink, C. (1984) *Teaching Special needs students in regular classroom.* Boston, M.A. Little, Brown.

Morsink, C. Branscum, G. and Boone, R. (1984) *Specialized competencies for SLD teachers : A review of related literature.* Gainsville : University of Florida, Dept., of Special Education.

Morsink, C.V. Thomas, C.C. and Smith-Davis, J. (1987) Noncategorical special education programmes : Process and Outcomes. In M.C. Wang, M.C. Reynolds and H.J. Walberg (Eds.), *Handbook of Learner Characteristics and Adaptive Education.* Pergamon Press, 287-312.

Palisnscar, A.S. and Brown, A.L. (1984) "Reciprocal Teaching of Comprehension—Comprehension Monitoring Activities." *Cognition and Instruction*, 1 (2) 117-175.

Ramaa, S. *Diagnosis and Remediation of Dyslexia—An attempt.* Mysore : Vidyasagar Printing and Publishing House, 1993.

Ramaa, S. (1991)—Noncategorical approach to teach reading to dyslexic and educable mentally retarded children, Paper presented in the Second International Canference on Dyslexia, Oxford.

Richardson, Ellis and Collier, Lucy, (1971) "Programmed Tutoring of decoding skills with third and fifth grade non-readers", *Journal of Experimental Education*, 39(3), 57-64.

Sindelar, P.T. and Deno, S.L. (1978)—"The effectiveness of resource programming, *Journal of Special Education*, 12, 17-28.

Stauffer, Russels, G. (1951)—"Certain Basic Concepts in Remedial Reading", *Elementary School Journal*, 51, 334-342

Stephens, E. (1980) "Direct Instruction research with moderately and severely retarded in Australia : A Review", *American Journal of Special Education* 12, 41-46.

Stevens, R. and Rosenshine, B. (1981)—"Advances in Research on Teaching", *Exceptional Education Quarterly*, 2(1), 1-9.

Tansley, A.E. (1967)—*Reading and Remedial Reading.* Routledge and Kegan Paul Limited.

Valcante, G. (1984)—Specialised cometencies for teachers of mildly emotionally handicapped students. A review of literature, Unpublished manuscript. University of Florida, Dept. of Special Education, Gainesville.

Walberg, M.C. and Birch, J.W. (1934a)—"Comparision of a full-time main-streaming programme and resources room approach", *Exceptional Children*, 51, 33-40.

Wang, M.C. and Birch, J.W. (1984)—"Effective Special Education in regular classes", *Exceptional Children*, 50, 391-398.

Weinstein, C.E. (1969)—*Elaboration skills as a learning strategy*. In H.F. O. Neil, Jr. (Ed.) Learning Strategies, New York : Academic Press, 31-55.

Zax, M., Wen, E., Rappaport, J., Beach, D. and Laird, J. (1968)—"Follow up of children identified early as mentally disturbed", Journal of Consulting and Clinical Psychology, 32, 369-374.