Dyslexia Assessment Profile for Indian Children

by Shanbaljc Kuppurajus

DYSLEXIA ASSESSMENT
PROFILE FOR INDIAN CHILDREN
(DAPIC)

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Introduction

Literacy is defined as the minimal ability to read and write in a designated language. The components of literacy include reading, writing, listening, phonological awareness, phonological decoding, reading comprehension, spelling, orthographic knowledge and rapid automatized naming. Phonological awareness among others has been shown to be a primary factor underlying early reading development. Learning to read, for many children seems not to require much effort. They appear to attain this ability almost incidentally. However, it seems to be correct in the languages where there is only one sound for each letter, where the assigning phoneme to a grapheme step is relatively easy. But in languages like English, the association of various different sounds with a particular letter and various different letters with a particular sound makes mastery of the sound symbol relationship more difficult. This irregularity in the language itself makes it even more difficult in those children who are poor in reading and writing skills.

Dyslexia can be described as a difficulty in reading even though sufficient teaching has been offered. As there are number of causes of dyslexia, there are different types of dyslexia, making dyslexia a heterogeneous group. Theoretically, there are several different types of dyslexia and for the convenience of classification; different subtypes have been proposed in the literature. Castles and Coltheart (1993) broadly classifies dyslexia into two main types called phonological and surface dyslexia. He opined that with difficulties in sub lexical skills shall come under phonological dyslexia and if a child with dyslexia has difficulties in lexical skills, he/she may fall under surface dyslexia. Edwards and Hogben (1999) included another type of dyslexia called mixed dyslexia, where there are difficulties in both lexical and sublexical route of reading.

Existence of successful dyslexia assessment tools in Indian multilingual context has been challenged. The purpose of an assessment should be to produce an appropriate Individual Education Plan (IEP) that clearly identifies the individual's strengths and weaknesses, their specific needs, and the timescale and resources required to implement the IEP. The study in this manual reveal that Dyslexia Assessment Profile for Indian Children (DAPIC), can be used as a tool to profile those children who show difficulties in phonological and non phonological tasks of literacy. It also suggests that differentiating among dyslexia subtypes with specific impairments allows a more fine grained understanding of the disorder than simply comparing children with dyslexia with typically developing children.

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TEST DESCRIPTION

The DAPIC includes the following main domains:

1. The Alphabet Subtest
2. Shape Copying (SC)
3. Written Language
   a. Spelling
   b. Handwriting Quality (HQ)
4. Reading
   a. Word Reading (Wreading)
   b. Non word Reading (NWreading)
5. Phonological Awareness Skills
   a. Rhyming test
   b. Alliteration test
6. Repetition
   a. Word Repetition (Wrep)
   b. Non word Repetition (NWrep)
7. Rapid Naming (RN)
8. Sound Discrimination (SDis)

The tasks that are considered as phonological are alphabet subtest, SDis, NWreading, NWrep, alliteration and rhyming whereas the tasks Wrep, Wreading, HQ, SC, RN and spelling are considered as non phonological.

1. The Alphabet Subtest

The first step of decoding is to learn that reading involves use of codes. Words are not written in arbitrary ways but according to an alphabetic principle by which letters have a regular and predictable relationship with sounds. Children come to understand that the alphabetic principle simplifies the reading process and that it is crucial that they attend to all of the letters to read accurately. The reader must also know the specific correspondence between letters, letter patterns and sounds. Acquiring this knowledge is primary task in decoding (Loomba, 1995). The alphabet subtest will help us determine if children have acquired this knowledge.

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2. Shape Copying (SC)

It is a test of visual perception and visual motor integration. This involves demonstrating children's competence by executing complicated motor operations such as drawing geometric forms from memory, tracing and copying (Crandall, Hammill, Witkowski & Barkovich, 1968). Shape copying will help us further understand readiness of a child's fine motor skills with particular reference to writing.

3. Written Language

a. Spelling

Normal spelling needs auditory and visual reception, auditory and visual memory, auditory and visual discrimination, association of auditory and visual stimuli, motor expression and vocal expression. Ability to spell enables the writer to concentrate on the ideas he wishes to convey rather than on the mechanics of writing (Frostig & Maslow, 1967).

b. Handwriting Quality (HQ)

Reversals, omissions and poor spacing are characteristic of a young child's writing. It is the persistence of such errors over a long period of time that is indicative of writing difficulty. Johnson and Myklebust (1967), suggest that such difficulties are associated with deficiencies in visual motor integration (dysgraphia), revisualization (memory), and formulation (syntax).

4. Reading [Word Reading (Wreading) & Nonword Reading (NWreading)]

The rationale for assessing a person's reading rate lies in the centrality of automaticity. Extremely slow reading simulates the decoding of a student with learning disability. Decoding problems consume his/her cognitive resources, leaving little of them for comprehension, eventually rendering reading comprehension more difficult. An inability to decode non-words highlights the grapheme phoneme translation difficulties that lie at the heart of an individual's specific learning difficulties. It also establishes the subject's degree of familiarity with the possibilities of written English orthography (Ehri, 1992).

5. Phonological Awareness Skills (Rhyming & Alliteration)

Children start to recognize similarities in sounds between words which have different meanings. It has been demonstrated that this prepares them well for learning about orthographic links between words once they begin the formal construction of linking phonemes to graphemes (Maclean, Bryant & Bradley, 1987). The phonological awareness like rhyming and alliteration skills have been found to become predictors of reading skills in children learning to read English.

6. Repetition [Word Repetition (Wrep) & Non word Repetition (NWrep)]

Word repetitions in very young children have been found to be related to the vocabulary size of the child (Gathercole & Baddeley, 1989; Hoff, Cotre & Bridges, 2008). The evidence for deficits in a core phonological domain predicts that children with below average reading ability will experience particular problems in print related decoding tasks such as pseudo word reading.

Word and non word repetition may become a measure of phonological working memory capacity in spite of the fact that researchers have consistently acknowledged that the task taps many language processes, including speech perception, phonological encoding, phonological memory, phonological assembly, and articulation. Poor performance on this task can be an indicator of phonological dyslexia.

7. Rapid Naming (RN)

Naming speed task assess the rate at which a verbal label for high frequency visual stimuli is produced. If an individual takes much longer than average to name all the stimuli, that individual is said have a naming speed deficit. Bowers and Wolf (1993) stated that slow naming speed is implicated in failure to learn to recognize words quickly. Wolf, Bowers and Biddle (2000) stated that naming speed (particularly serial naming speed) provides an early, simpler approximation of the reading process. They believed that naming speed is conceptualized as a complex ensemble of attentional, perceptual, conceptual, memory, phonological, semantic and motoric sub processes that place heavy emphasis on precise time requirements within each component and across all components.

8. Sound Discrimination (SDis)

The ability to hear the difference between acoustically similar speech sounds (e.g.: /pin/ - /bin/) is speech sound discrimination. Research shows that speech discrimination skills are related to a child's language, phonological and literacy development. Children with a range of developmental disorders including language impairment and dyslexia show difficulties with speech sound discrimination tasks. Phoneme discrimination is basically an auditory processing skill.
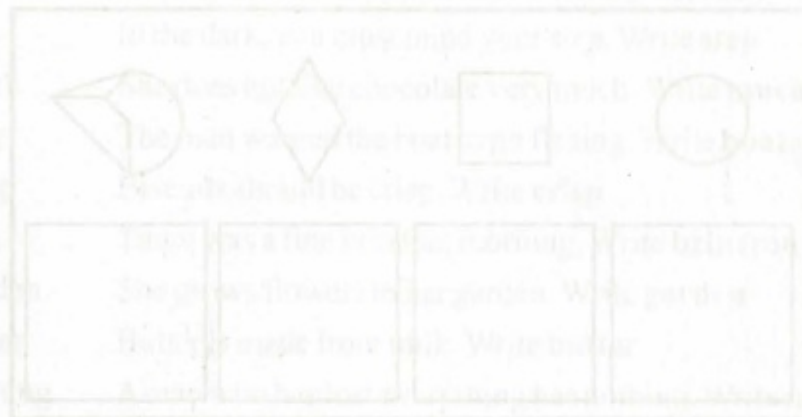
Test Material

DYSLEXIA ASSESSMENT PROFILE FOR INDIAN CHILDREN (DAPIC)

1. **Alphabet –**   Examiner should say an alphabet and the child should write it. Visually
    similar alphabets (nine in number) are considered in this subtest.

    1) b   2) d   3) p   4) g   5) q   6) m   7) w   8) u   9) n

    Scoring is as follows:

    1 – Correct   0 – Incorrect
    Total score: 9

2. **Shape Copying (SC) –**   A total of four shapes are included and the child is instructed to
    copy the given shapes.
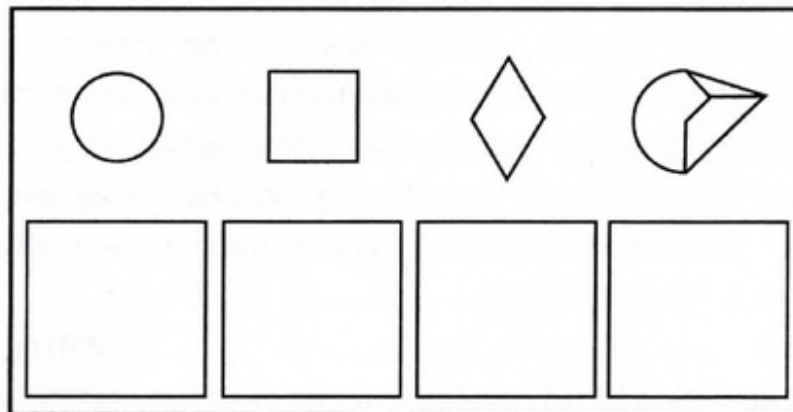
    Scoring is as follows:

    Shape 1 : Score 1 – Correct shape and Score 0 – Incorrect shape

    Shape 2 : Score 1 – Correct shape and Score 0 – Incorrect shape

    Shape 3 : Score 1 – Correct shape and Score 0 – Incorrect shape

    Shape 4 : Score 7 – Most approximating shape, Score 1 – Least clear shape and Score 0
        – Incorrect Shape. Examiner can score from 0 to 7 depending on the clarity
        of the shape.

    Total score: 10

3. Written Language

a. **Spelling** – Child should be asked to write down the spelling for words and non words that are dictated. There are 30 words and 10 non words. The nonwords included follow the phonotactics of English.

1.	Lot	A lot of people watch television. Write **lot**
2.	Pig	The farmer had a pig to sell. Write **pig**
3.	Cug	They couldn't fine the cug anywhere. Write **cug (bug)**
4.	This	This cake is better than that cake. Write **this**
5.	Be	Be careful while crossing the road. Write **be**
6.	Fish	Haddock is one kind of fish. Write **fish**
7.	Tent	Campers use a tent. Write **tent**
8.	Yoll	He did not want to yoll the boat. Write **yoll (doll)**
9.	Step	In the dark, you must mind your step. Write **step**
10.	Much	She does not like chocolate very much. Write **much**
11.	Boat	The man wanted the boat to go fishing. Write **boat**
12.	Crisp	Biscuits should be crisp. Write **crisp**
13.	Brin	There was a fine brin that morning. Write **brin (pin)**
14.	Garden	She grows flowers in her garden. Write **garden**
15.	Butter	Butter is made from milk. Write **butter**
16.	Nothing	A man who has lost everything has nothing. Write **nothing**
17.	Wooden	A cook sometimes uses a wooden spoon. Write **wooden**
18.	Moid	She put the paper on the moid. Write **moid (void)**
19.	Swan	A swan has a long neck. Write **swan**
20.	Another	After trying one, he asked another. Write **another**
21.	Angry	Angry people sometimes shout. Write angry
22.	Cattle	Cattle graze in the field. Write **cattle**
23.	Rilt	He could see the rilt clearly. Write **rilt (hilt)**
24.	Promise	A promise should be kept. Write **promise**
25.	Country	France is the country across the channel. Write **country**

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26.	Hospital	A nurse works in a hospital. Write **hospital**
27.	Driggle	The driggle was covered in the green paint. Write **draggle (wriggle)**
28.	Trousers	In hot climates, men wear short trousers. Write **trousers**
29.	Thread	To make a necklace, you thread beads on a string. Write **thread**
30.	Sword	The soldier carried a sword. Write **sword**
31.	Passage	He walked down a long passage. Write **passage**
32.	Plicant	The boy was very plicant. Write **plicant (ant)**
33.	Stronk	He could not stronk easily. Write **stronk (honk)**
34.	Quarter	A fourth is a quarter. Write **quarter**
35.	Heart	The heart pumps blood through our body. Write **heart**
36.	Cladition	There was not much cladition that day. Write **cladition** (tradition)
37.	Biscuit	She had a biscuit with her tea. Write **biscuit**
38.	Parcel	Parcel for the post should be well wrapped. Write **parcel.**
39.	Trabnag	The trabnag did not move. Write **trabnag**
40.	Adventure	Most boys and girls like adventure stories. Write **adventure.**

Scoring is as follows:

1– Correct   0– Incorrect

Total score: 40

b. Handwriting quality (HQ) – This section is scored from Spelling performances.

Scoring is as follows:

5– Very good handwriting   1– Bad handwriting.

Total score: 5

4. **Reading**

a. Word Reading (Wreading) –   The child has to read the words that are given. There are a total of 70 words including both regular and irregular words.

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1. tree	25. little	49. school
2. egg	26. book	50. playing
3. sit	27. frog	51. road
4. bun	28. flower	52. light
5. clock	29. train	53. summer
6. picture	30. think	54. dream
7. people	31. something	55. shepherd
8. downstairs	32. biscuit	56. sandwich
9. thirsty	33. crowd	57. island
10. beginning	34. postage	58. ceiling
11. saucer	35. angel	59. canary
12. appeared	36. knife	60. nephew
13. attractive	37. imagine	61. applaud
14. gradually	38. smoulder	62. diseased
15. disposal	39. nourished	63. knowledge
16. university	40. orchestra	64. physics
17. audience	41. situated	65. intercede
18. campaign	42. choir	66. siege
19. fascinate	43. forfeit	67. prophecy
20. recent	44. plausible	68. systematic
21. colonel	45. soloist	69. genuine
22. slovenly	46. classification	70. conscience
23. institution	47. pivot	
24. heroic	48. milk	

Scoring is as follows:

    1 – Correct   0 – Incorrect

    Total score: 70

b. Nonword Reading (NWreading) – 10 nonwords are listed and the child has to read the given nonwords. 3 practice items are included to familiarize the child with the task.

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Practice items:

Hab   lib   feg

Test items:

One syllable	Two syllable
1. Gat	6. Higure
2. Rop	7. Kibnick
3. Shug	8. Pachine
4. Hild	9. Clabnag
5. Narge	10. Tringdom

Scoring is as follows:

1– Correct   0– Incorrect

Total score: 10

5. **Phonological Awareness Skills**

a. **Rhyming Test** – 20 stimuli, each consisting of 3 words are included and the child has to find out the words which are in rhyme. E.g. Bat, Mat, Wall- Here "Bat" and "Mat" are in rhyme with each other whereas 'Wall" is not. 3 practice items are also included to facilitate familiarization with the task.

Practice items:

tack	**need**	hack
rap	lap	**nag**
fit	till	bill

Test items:

1. main	**line**	pain	4. **buckle**	puddle	muddle
2. fog	log	**bag**	5. tight	light	**ride**
3. **fuss**	tilt	wilt	6. **niece**	cheese	please

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7.	neck	peck	**beg**		14.	nip	**fib**	tip
8.	nap	**hip**	sap		15.	tone	**home**	phone
9.	pen	hen	**pet**		16.	cattle	battle	handle
10.	**red**	big	dig		17.	should	wood	**food**
11.	**pip**	top	hop		18.	**neat**	weed	seed
12.	hid	did	**dub**		19.	ship	rip	**stop**
13.	pack	**buck**	rack		20.	tree	**need**	free

Scoring is as follows:

1– Correct   0– Incorrect

Total score: 20

b. Alliteration Test – 10 stimuli, each consisting of 3 words are included and the child has to find out the words which are in alliteration with other words. E.g.: Shine, Shoe, Shop, Monsoon. In this example, all the other words begin with the letter 's' except for the word 'Monsoon', which begins with a different letter. 4 practice items are included to familiarize the child with the task.

Practice items:

sell	big	bang
fat	**hot**	felt
block	bright	**plate**
stair	**trick**	swop

Test items:

1.	gap	got	**nod**		6.	**train**	plane	prone
2.	net	**dig**	nip		7.	spade	start	**break**
3.	**rope**	take	time		8.	crumb	**twist**	climb
4.	big	**pit**	ball		9.	pram	**trap**	plan
5.	form	fat	**van**		10.	great	glue	**crane**

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Scoring is as follows:

    1– Correct   0– Incorrect

    Total score: 10

6. **Repetition**

    a. Word Repetition (Wrep) – 7 sets of words are included ranging from 2 to 5 words in each set. The child has to repeat words after the examiner in the same sequence.

1.	Pin	cat			
2.	Cap	sky	tin		
3.	Mat	crow	pick		
4.	Rain	pen	chair	men	
5.	Pit	day	log	shirt	
6.	Cow	wool	snake	hut	grape
7.	Plank	lion	heel	plot	den

Scoring is as follows:

    1– Correct   0– Incorrect/If sequence is altered

    Total score: 7

    b. Nonword Repetition (NWrep) – 8 stimuli are included ranging from 1 to 4 nonwords in each. The child has to repeat nonwords after the examiner in the same sequence.

1.	Ket			
2.	Lum			
3.	Mup	hin		
4.	Ret	spige		
5.	Trum	frut	nabe	
6.	Ronch	tarp	keld	
7.	Horp	brid	nate	proog
8.	Fode	wike	drup	cren

Scoring is as follows:

1 – Correct   0 – Incorrect/If sequence is altered.

Total score: 8

7.   **Rapid Naming (RN) –**   A random sequence of 35 pictures is presented and the child should be instructed to name the pictures as fast as possible. Time taken to completely name all the pictures should be noted.

8. **Sound Discrimination (SDis)** – Word pairs differing by one phoneme are presented and the child has to say whether the two words of the pair are same or different. 3 practice items and 20 test items constitute the stimuli of this section.

E.g.: Cat, Rat- Different

Pin, Pin- Same

Practice items:

Pig - Dig – Different

Bat - Bat – Same

Lake - Date – Different

Test items:

1.	Rip - tip	11.	Sick - sack
2.	Side - side	12.	Pet - bet
3.	Big - bog	13.	Sit - sit
4.	Bed - bad	14.	Dam - mad
5.	Slow - snow	15.	End - and
6.	Fish - fish	16.	Shelled - shield
7.	Halt - hall	17.	Try - tie
8.	Tilt - tilt	18.	Ship - sheep
9.	Raw - war	19.	Throw - throw
10.	Rip - reap	20.	Nib - nip

Scoring is as follows:

1– Correct   0– Incorrect

Total score: 20

Score sheet

DYSLEXIA ASSESSMENT PROFILE FOR INDIAN CHILDREN (DAPIC)

Name :

School :

Grade :

Age at test time and Gender :

Tested by :

	Test domain	Maximum score	Individual's score
1.	Alphabet Subtest	9	
2.	Shape Copying	10	
3.	Writing a. Spelling b. Handwriting Quality	40 5	
4.	Reading test a. Word Reading b. Non word Reading	70 10	
5.	Phonological Awareness Skills a. Rhyming test b. Alliteration test	20 10	
6.	Repetition a. Word repetition b. Non word repetition	7 8	
7.	Rapid Naming (RN)	Time taken	
8.	Sound Discrimination (SDis)	20	
	Total Score	**209**	

Remarks:

Signature of clinician

Signature of staff

PROFILE FOR SUBGROUPING CHILDREN WITH DYSLEXIA

Poor performance in the following concepts • Nonword Repetition • Nonword Reading • Rhyming • Alliteration • Sound Discrimination	Phonological Subgroup
Poor performance in the following concepts • Word Reading • Word Repetition • Spelling • Rapid Naming	Surface Subgroup
Poor performance in one or many of the tasks from both groups	Mixed Group

AIISH GENESIS AND GROWTH

The All India Institute of Speech and Hearing is a premier Institute in the country imparting training in the field of Speech and Hearing. Established on 9th August 1965 as an autonomous organization, AIISH caters to manpower generation in the field, promoting research and providing rehabilitation services in the area. The Institute is located on a sprawling area of 39 acres (two campuses) in Mysore. The Institute registered as a Society under the Societies Registration Act XXI of 1860 (Punjab Amendment Act, 1957) and its functioning as an autonomous body under the aegis of the Union Ministry of Health and Family Welfare.

Established primarily as a training institute, it started training programs at postgraduate level in 1967 followed by B.Sc. (Speech and Hearing) in 1968. The institute now offers three Diploma programs: Diploma in Hearing Aids and Ear mould technology, Diploma in training the Young Hearing Impaired, Diploma in Language, Hearing and Speech through distance mode; two graduate programs: Bachelors in Audiology, Speech and Language Pathology (B.Sc - Sp. & Hg) and B.S. Ed. (Hearing Impairment); three Master Programs (M.Sc. in Audiology, M.Sc. in Speech-Language Pathology and M.S.Ed. in Hearing Impairment); two PG Diploma courses (PG Diploma in Forensic Sciences and Technology, Clinical Linguistics for SLPs); two doctoral programs (Ph.D. in Audiology and Speech-Language Pathology); and Post Doctoral Fellowships. The institute also conducts short – term training and orientation programs for professionals in allied specialties.

AIISH is recognized as a reputed organization for training manpower in the field of speech and hearing and related areas throughout the country. The institute has been recognized as a Centre for Excellence in the area of Deafness (WHO), as a Centre for Advanced Research (UGC) and as a Science and Technology Institute (DST). The institute is affiliated to the University of Mysore for the award of degrees. The academic programs of the institute have the recognition of the Rehabilitation Council of India. The functioning of the institute is under the direction of the Executive Council with the Hon'ble Union Minister for Health and Family Welfare as the Chairman and the Hon'ble Minister of Health and Family Welfare, Government of Karnataka as Vice – Chairman. The other statutory bodies of the Institute are the Finance Committee and the Academic Committee.

The Dyslexia Assessment Profile for Indian Children (DAPIC) was developed as an outcome of the research project funded by the AIISH research fund. The assessment profile can be used by Speech-Language Pathologists as a tool to profile those children who show difficulties in phonological and non phonological tasks of literacy.

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9 Savage, Robert S. Frederickson, Norah. "Beyond phonology: what else is needed to describe the problems of below-average readers and spellers", Journal of Learning Disabilities, Sept-Oct 2006 Issue
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