

# THE STUDY OF BILINGUAL DYSLEXIC CHILDREN LEARNING HINDI AND ENGLISH AT MORPHO-PHONOLOGICAL LEVEL

By

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## **Abstract: -**

*This research is a study of 20 bilingual dyslexic children learning Hindi and English in the schools of Delhi. A comparative study on was carried out among 20 dyslexic children and 20 chronologically age (CA) matched controls in the age group of 6-15 years both in Hindi and English language separately. The focus of this research is to understand the lexical usage and development by examining the various morpho-phonological characteristics that are unique to dyslexic children. The effect of orthography was also observed to understand the cognitive process in reading and writing in the two different orthographies.*

**INTRODUCTION**

“Why am I not able to read and write the way my classmates do? Am I stupid? Am I lazy or am I not intelligent? I want to learn. Can you teach me the way I can learn?”

This is not just a question but an urgent need of someone who is willing to learn. Learn to read and write, to be literate, to achieve a goal, to be independent.

For many years dyslexia and other reading problems were not known to most teachers and parents. As a result, too many children passed through school without mastering the printed page. Some were treated as mentally deficient; many were left functionally illiterate, unable to ever meet their potential. But it has been only recently that we have known about Dyslexia. It has been a revolution in what we’ve learned about reading problems and dyslexia. Scientists like Sally Shaywitz and Berniger used variety of new imaging techniques to watch the brain at work. Their experiments have shown that reading disorders is most likely the result of what is, in effect, faulty wiring in the brain and not laziness, stupidity or a poor

home environment. There’s also evidence found that dyslexia is largely inherited. Scientists have defined four chromosomes that may have been involved. Dyslexia is now considered a chronic problem for some children, not just a “phase”. Scientists have also discarded another old stereotype, that almost all dyslexics are boys. Studies indicate that many girls are also affected and seeking help. (<http://www.dyslexia-teacher.com/t100.html>).

This research investigates the linguistic development at morpho-phonological level by bilingual Dyslexic children learning Hindi and English in the schools of Delhi.

Language plays an important role in communication. Not only spoken language but written language has also acquired a predominant position in human civilization. Information exchange through some form of written language has become inevitable and indispensable in this modern world. Human invention of writing as a mode of representing spoken word is a major evolutionary development.

In today’s modern and advanced society, education is a must for almost everyone. In order to survive and live a respectful life one needs to be literate. Even for small things in life like buying groceries from supermarket or paying bills one needs to recognize the printed page. Written language has acquired a dominant position in human civilization. No one can move on without getting mastered the printed page. Written language is an extremely valuable form of linguistic representation, since it allows humans to keep a permanent record of specific linguistic messages. (Caplan, D,1987,p.233).

Dyslexia is a reading disorder where the person has problem in recognizing words and processing the grapheme-phoneme correspondence. Along with dyslexia, one can also have a writing disorder called dysgraphia and mathematics disorder called dyscalculia. Developmental Dyslexia occurs in children by birth. The child with normal IQ and no less than other children of their peer group can also be detected with developmental dyslexia. This is a time to wake up, to recognize the problem and proper diagnosis needed to understand the problem and proper remedy applied to overcome this problem. Dyslexia can be treated and almost 80% of the problem can be solved. Although it is a life- long problem as it is genetic but the best thing about this problem is that it is curable. There have been many famous dyslexics like Einstein, Tom Cruise and many who proved their ability. (Dyslexia-Wikipedia, the free encyclopedia)

Dyslexia usually manifests itself as failure in learning to read in the first grade at school. The reading difficulty can continue to adulthood. Early recognition of signs and symptoms can help the child to be identified and proper diagnosis can be done. (Shaywitz.S, Overcoming dyslexia,2005)

**Definitions of Dyslexia by various researchers and organizations**

Dyslexics are not able to read properly and spell in a weird fashion. Letters on a page appeared meaningless jumble-with no more logic than alphabet spaghetti. They cannot make a connection between what they heard and what appeared on the page. (Sophy Fisher,Independent, Education. 7 November 1996) as cited in (Hulme and Snowling, 1997:1).

Discussions about dyslexia are frequently constrained within a space which is entirely defined by surface behavior like performance on reading, spelling and IQ tests and difference between them. However, tests scores are only the starting point for the scientific study of dyslexia. (Hulme and Snowling, 1997:1).

To give substance to the discussion of dyslexia, Turner says that “Dyslexia is a specific learning difficulty in which a disorder of phonological processing, frequently inherited, compromises the development of internal phonological representations. This difficulty affects, first of all at various low-level aspects of speech processing (phonological manipulation: rhyming, blending, segmenting and articulatory sequencing) and latterly the acquisition of the written language sequences, which depend upon these skills (reading more specifically phonological decoding and spelling). (Turner, 1997:10)

Margaret Snowling defined developmental dyslexia as the unexpected failure of a child to acquire written language skills. In November 1994, the Research Committee of the Orton Dyslexia Society (ODS) consolidated what appear to be a new consensus, as well as signing agreement with it, by adopting a new definition of this most common and best defined learning disability as follows:” Dyslexia is one of the several distinct learning disabilities. It is a specific language-based disorder of constitutional origin characterized by difficulties in single word decoding, usually

reflecting insufficient phonological processing abilities. These difficulties in single word decoding are often unexpected in relation to age and other cognitive and academic abilities; they are not the result of generalized developmental disability or sensory impairment.” (Turner, 1997:3).

In March 1996, after extensive consultation, the Dyslexia Institute published its own revised definition of dyslexia, as follows:

“Dyslexia is a specific learning difficulty that hinders the learning of literacy skills. This problem with managing verbal codes in memory is neurological based and tends to run in families. Other symbolic systems, such as mathematics and musical notation can also be affected”.

A comprehensive, complete definition adopted by the Orton Dyslexia Society, renamed the International Dyslexic Association, states that dyslexia is a neurologically based, often familial disorder which interferes with the acquisition and processing of language. Varying in degrees of severity, it is manifested by difficulties in receiving and expressing language, including phonological processing in reading, writing, spelling, handwriting, and sometimes in arithmetic.

There is no one dyslexic profile, no one standard set of characteristics, some experience eye hand co-ordination difficulties, while others are able to solve intricate puzzles and designs. Some seem to be in a world of their own, while others listen attentively and are very aware of their general surroundings. Some cannot decode the simplest word; while others can read almost anything but have trouble comprehending what they read.

### **Role of orthography in reading and writing process**

Much of the data on which the models have been built come from users of the complex/opaque alphabetic scripts of the western world. Scripts like English with a small set of graphemes representing a larger number of phonemes are often highly irregular by virtue of the lack of adequate grapheme-phoneme correspondence. A substantial amount of data-based research in support of these psycholinguistic models of reading has been built over the last 2-3 decades. The data so far has largely been from “alphabetic scripts” particularly opaque alphabetic scripts like English and French, though it has been recognized that the dyslexia’s in other kinds of scripts may be different owing to their differential reliance upon one or the other of the routes included in the universal model. Questions about the universal applicability of these models have been raised given that the scripts of the world differ in terms of the extent to which they depend on the rules for processing. There is, as yet, inadequate documentation of the acquired dyslexics in the relatively transparent alphabetic scripts such as Italian and German and the non-alphabetic scripts such as the ideographic, syllabic and alpha-syllabic scripts.

It is our contention that the database for the study of reading and its disorders needs to be widened extensively to include the entire range of writing systems in the world before we can arrive at a universal model of reading. The study of the acquired dyslexia in bi-literate/bi-scriptals or readers of two different writing systems would also help arrive at a better understanding of the complex issue involved in readings, its acquisition, its teaching, its disorders and their management. ( Karanth, 2003)

Studies of Dyslexia in General and in Bilingual Children: -

During the last couple of decades there has been an increase in the documentation of learning disability and reading disability in particular among Indian children.

A recent survey on learning disabilities in Indian children from the state of Kerala, (where Malayalam is spoken) by Suresh & Swapna (2003), using a broad definition of LD indicated an incidence of about 10% in a large unselected population. However these figures do not represent reading difficulty alone. ( Karanth, 2003, pg. 100-101)

### **Research Methodology**

This research was cross-sectional and empirical based. The dyslexic children were visited Regularly for about 10 to 15 days. Data was collected from one of the schools of Delhi.

Subjects were selected on the basis of their disability criteria. Only Dyslexic children were selected for this research.

Data was collected through Questionnaire method. Separate Questionnaire was prepared for English and Hindi Language. Separate tests were conducted on Reading skills as well as on writing skills. The present study investigated the Linguistic errors produced by bilingual Dyslexics at word level in Hindi and English. The scope of the study was to identify the types of errors produced by bilingual dyslexics and look into its cognitive process. The purpose of the research was to identify the types of errors produced at word level and compare it with the normal children of chronologically same age and gender. The research aims at writing case studies to identify the major types of errors produced and can be specified to dyslexics only.

### **Aims and Objectives of the research**

To analyze and describe the linguistic deviations produced by bilingual dyslexics at word level in Hindi and English

To classify and tabulate the Deviations as

- Phonetic vs phonological reading errors,
- Graphic vs graphological writing errors.

Each of these errors was further classified as types of errors as follows:

- Substitution types of errors
- Deletion types of errors
- Addition types of errors
- Metathesis/Reversal and
- Other types of errors

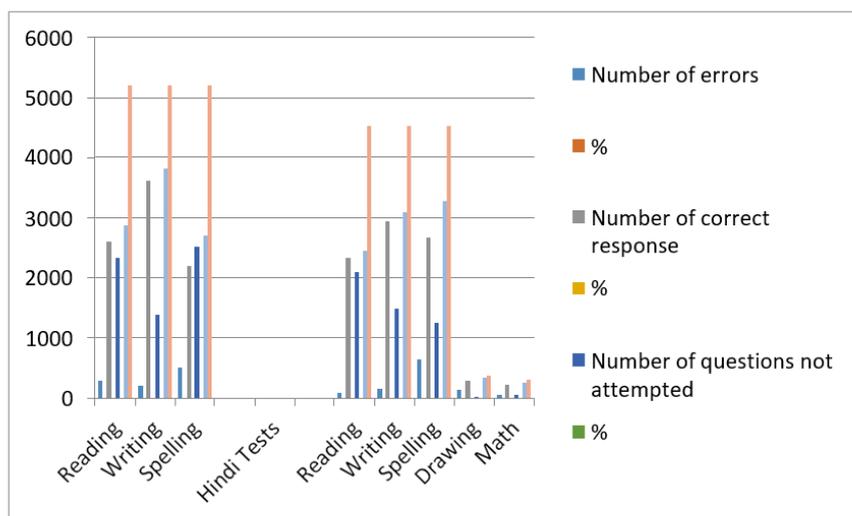
**Results**

After identifying and classifying all the errors produced by 20 dyslexic cases, it was found that the maximum number of errors produced was in Hindi Spelling. Minimum number of errors was found in Hindi Reading. English had the maximum number of errors as compared to Hindi in all other tests. Below is the chart containing all the errors in all the tests conducted on Dyslexics and Non-dyslexic children. The chart includes total number of errors, total number of correct responses and total number of questions not attempted along with its percentage. The dyslexic children were very slow in their responses as compared to the control group. They took longer time to complete the tests. Most of them were not interested in reading tests as this is the more problematic area of language for them. Dyslexic children took too much time to read a single word. The types of errors produced were of substitution, deletion, addition and metathesis as well as reversal types. Total number of errors and correct response with the percentage table of both i.e. dyslexic and control group

Table 1  
**Table of all the deviations produced by Dyslexic group**

<b>English Tests</b>	Number of errors	% of errors	Number of correct response	% of correct response	Number of questions not attempted	% of questions not attempted	Number of questions attempted	Total number of questions
Reading	286	5.5%	2586	49.7%	2329	44.7%	2871	5200
Writing	208	4%	3612	69.4%	1380	26.5%	3820	5200
Spelling	507	9.7%	2185	42%	2510	48.2%	2690	5200
<b>Hindi Tests</b>								
	Number of errors		correct response					
Reading	96	2.1%	2337	51.7%	2087	46.1%	2433	4520
Writing	151	3.3%	2932	64.8%	1482	32.7%	3083	4520
Spelling	626	13.8%	2659	58.8%	1235	27.3%	3285	4520
<b>Drawing</b>	144	37.8%	297	78.1%	27	7.1%	354	380
<b>Math</b>	55	18.3%	230	77.6%	45	15%	255	300

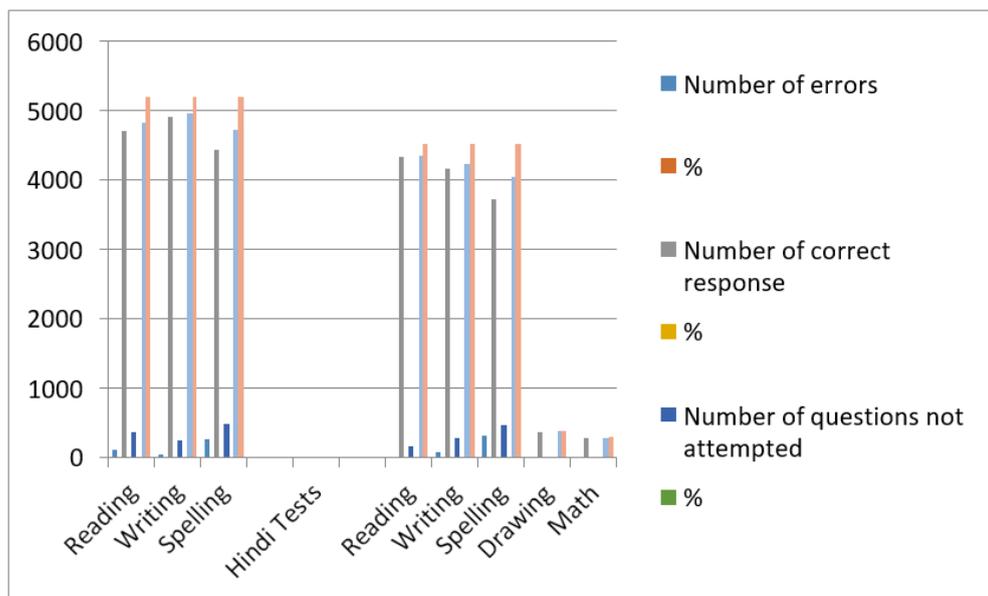
Figure 1  
**Bar graph of all the deviations produced by Dyslexic group**



**Table 2**  
**Table of all the deviations produced by control group**

English Tests	Number of errors	% of errors	Number of correct response	% of correct response	Number of questions not attempted	% of questions not attempted	Number of questions attempted	Total number of questions
Reading	120	2.3%	4706	90.5%	371	7.1%	4829	5200
Writing	51	0.9%	4901	94.2%	248	4.7%	4952	5200
Spelling	273	5.2%	4441	85.4%	486	9.3%	4714	5200
<b>Hindi Tests</b>	Number of errors	%	correct response	%				
Reading	26	0.6%	4332	95.8%	162	3.6%	4358	4520
Writing	80	2%	4153	91.8%	286	6.3%	4234	4520
Spelling	324	7.2%	3724	82.3%	472	10.4%	4048	4520
<b>Drawing</b>	04	1%	376	98.9%	0	0	380	380
<b>Math</b>	09	3%	278	92.6%	13	4.3%	287	300

**Figure 2**  
**Bar graph of all the deviations produced by control group**



Here are some of the descriptions of the above-mentioned results.

**English reading results**

- Dyslexic children had more number of errors than that of non-dyslexic.
- Dyslexic group had 286 errors and non-dyslexics had 120 errors. The total percentages are 5.5% and 2.3%
- Number of correct responses of dyslexics was 2586 and 4706 of non-dyslexics
- Percentage of correct responses of dyslexics and non-dyslexics are 49.7% and 90.5%.
- Maximum errors were of substitution types.

**Hindi reading results**

- Total number of errors produced by dyslexics and non-dyslexics are 96 and 26. The percentage is 2.1% and 0.5%
- Total number of correct responses by dyslexics and non-dyslexics are 2337 and 4706. Total percentage is 51.7% and 95.8%
- Maximum errors were of substitution types.

- Dyslexics had more number of errors as compared to non-dyslexics

### English writing results

- Total number of errors produced by dyslexics and non-dyslexics are 208 and 51. The percentage is 4% and 0.9%
- Total number of correct responses by dyslexics and non-dyslexics are 3612 and 4901. Total percentage was 69.4% and 94.2%
- Maximum errors were of substitution types.
- Dyslexics had more number of errors as compared to non-dyslexics.

### Hindi writing results

- Total number of errors produced by dyslexics and non-dyslexics are 151 and 80. The percentage is 3.3% and 2%
- Total number of correct responses by dyslexics and non-dyslexics are 2932 and 4153. Total percentage was 64.8% and 91.8%
- Maximum errors were of substitution types.
- Dyslexics had more number of errors as compared to non-dyslexics.

### English spelling results

- Total number of errors produced by dyslexics and non-dyslexics are 507 and 273. The percentage is 9.7% and 5.2%
- Total number of correct responses by dyslexics and non-dyslexics are 2185 and 4441. Total percentage was 42% and 85.4%
- Maximum errors were of substitution types.
- Dyslexics had more number of errors as compared to non-dyslexics.

### Hindi spelling results

- Total number of errors produced by dyslexics and non-dyslexics are 626 and 234. The percentage is 13.8% and 7.2%
- Total number of correct responses by dyslexics and non-dyslexics are 2659 and 3724. Total percentage was 58.8% and 82.3%
- Maximum errors were of substitution types.
- Dyslexics had more number of errors as compared to non-dyslexics.

### Results of Drawing and Math tests

In both Math and drawing tests, dyslexic children had more number of errors than normal children.

### Differences observed in time taken, amount of tests completed, and handwriting

- Time taken by dyslexic children was much more than compared to non-dyslexics for all the tests.
- Time taken to do the writing tests was one and a half hours to two hours by dyslexic children. On the other hand non-dyslexics took 20 to 40 minutes to complete the writing test.
- Dyslexic children could not complete the whole paper especially in reading and spelling tests. Control group completed the whole paper without any hesitation.
- Handwriting of dyslexic children was not good in spelling tests as compared to control group.

The results obtained after identifying and tabulating all the errors produced by 20 dyslexic cases, it was found that dyslexics had more number of errors as compared to non-dyslexics. Maximum number of errors produced was in Hindi Spelling as compared to all other tests. Minimum number of errors was found in Hindi Reading. English had the maximum number of errors as compared to Hindi in all other tests.

It can be concluded as:-

- Maximum number of errors was produced in English as compared to Hindi overall.
- *English reading* had more number of errors than *Hindi reading*.
- Hindi reading had minimum number of errors overall.
- *English writing* had more number of errors than *Hindi writing*.
- *Hindi spelling* had more number of errors as compared to *English spelling*.
- Dyslexic children had more number of errors in Drawing as compared to non-dyslexics.
- Dyslexic children had more number of errors in Math as compared to non-dyslexics.

### Brief discussion based on the results

From the results we could see that orthography plays an important role in language learning. The results for reading showed that Hindi had less number of errors as compared to English. One of the reasons could be orthographic effect. More transparent the orthography is, less number of errors produced in reading. In the process of reading, generally we follow two routes. One is whole word route and other is phonological route. When we come across new word we

generally follow phonological route to read. That is how grapheme-phoneme correspondence rule is followed. Readers of phonologically transparent orthographies such as Hindi scripts, which do not have a large number of irregular words, do not rely on logographic or lexical reading to the same extent as readers of opaque alphabetic scripts do. In this research Hindi had less number of errors as compared to English in reading. It shows that number of errors produced will be less because it follows GPC rule mostly. But at the same time we cannot claim that there will be no error produced all. There are certain areas which are difficult to process like nasalized consonants. In English orthography, there are regularly spelled words as well as irregularly spelled words. It means some words follow GPC rule and some do not. Therefore, irregularly spelled word criteria are somewhat responsible for producing more errors in Opaque alphabetic script like English especially in reading. Therefore, opaque orthography as well as irregularly spelled word in that language could be the reasons for difficulty in reading; hence number of errors produced in English is more than in Hindi.

### Projections for future Investigation

The present research shows that dyslexic children had more problems in reading English than Hindi. In English the appearance of word does not show how it is articulated. A distinct phonological structure is rather difficult to formulate since English is a language of varying contrasts and features. Research and investigating of dyslexic nature are rare in India though there have been recent attempts. This probably shows that we give less importance to problems in English reading, thinking that it will be corrected after some time without actually knowing that it could be the cause of dyslexia. People cannot accept this so easily and hence leads to sometimes in complete failure in reading. As they are able to read Hindi which is their first language, there is hardly a reason to think of any deficiency. Though a number of researches are being attempted, it needs to be expanded in India especially in bilingual situations where English being the second language in Indian contexts. Though a couple of significant findings have encouraged the pattern of enquiry, it is necessary to educate the Nation about this disability that is ailing perhaps a large proportion of learners with no major intervention. Nehru (1997, New Delhi) has propounded a couple of theories concerning hypothesis to explain dyslexic reading errors which is based on distorted grapheme representation. Rama (1984, Mysore) has brought out a study attempting to diagnose and remediate dyslexia among the Kannada readers.

- In most of the schools these children are invisible in the present schooling system. They need to be recognized. Children who are continuously lacking behind their peers need to be attended separately. Teachers have to be made more aware so that they can focus better on them.
- The present research gives a clear distinction in the performance of the dyslexics and the normal children. Dyslexic children are continuously lacking behind their peers in almost all the language learning skills.
- There is a vital role of the orthography of the language concerned to assess the intensity in word recognition of the language. Phonics refers to the sound- letter association. It begins with an understanding that each letter of the English alphabet stands for one or more sounds. Phonemic awareness refers to the ability to hear and differentiate between the various grapheme-phoneme structures. The structure of the language under consideration plays a major part in the recognition and processing aspect. Unlike English, where there can be a lot of spelling rules including magic 'e' rules, silent letters, soft 'c's and 'g's, hard 'c's and 'g's etc., which can create additional confusion for the reader, Hindi has on the other hand a very distinct pattern of grapheme- phoneme structure. Most word constructions in Hindi language are pronounced in a consistent manner. Dyslexics who speak and read English have problems because the appearance of a word does not necessarily tell how it is pronounced, for example 'but' and 'put' are not pronounced the same way.
- Individuals with deficits in phonemic awareness are likely to have poor decoding accuracy. An individual with a phonological awareness deficit often has trouble associating a grapheme with its phoneme. While this could be true of the English reader, the parallel cannot be drawn on a similar pattern in Hindi language. The phoneme /k/ for instance would not be the same in the words *kite* and *knight* (where /k/ is silent). On the other hand, in Hindi language phoneme /m/ would always sound the same in any situation. Hindi has a nearly absolute one-to-one grapheme-phoneme consistency.
- Finally, many of the dyslexic learners with word recognition disabilities consequently have problem in their phonological awareness and orthographic knowledge, knowledge of grapheme-phoneme correspondences in the alphabetic principle, and application to phonological decoding.

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