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The Initial Blueprint of Errors Similar to the Phenomenon of Deep Dyslexia: As Reflected by Children with Dyslexia during Reading Hindi Words

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Abstract – This paper reports on the classification of Hindi (language) words with respect to deep dyslexia phenomena as found during a linguistic investigation of specific errors as shown by children with dyslexia (CWD) during reading. The analysis is based on the data collected throughout an academic year from a total of forty-six children identified as dyslexic, having Hindi as a mother tongue or first language, and studying in class second to fifth. The findings are organised under four themes; first is similar meaning and the same language, second is similar meaning but different language, third is different orthography and different meaning but share a relationship, and fourth is different words but have some resemblance in orthography but differ in 'matraa'. One another possibility was also considered as fifth theme i.e. incoherent, but no details came under this out of the data collected. It was found that despite differences in the linguistic contexts of English and Hindi, deep dyslexia crosses language boundaries. The derived considerations are discussed which will perhaps work as a foundation, provide some reflections for further research, and hope to convey comprehension to some extent of how deep dyslexia reflects in words of Hindi language.

Keywords: Dyslexia, Deep Dyslexia, Dyslexia in Hindi Language, Children with Dyslexia, Reading.

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INTRODUCTION

Dyslexia is a learning difficulty in the processing of reading and writing resulting in a significantly below reading ability than the person's intellectual level (Snowling, 2000) and typically delineated by problems in reading, spelling, and word recognition (Grigorenko, 2001). It has been classified into three major syndromes: surface, phonological, and deep dyslexia (Coltheart, 1987; Ellis & Young, 1988). From the psycholinguistic viewpoint, Marshall and Newcombe (1973) also distinguished three categories of acquired dyslexia. First is 'surface dyslexia', in this comprehension is mediated by grapheme-to-phoneme conversion strategies in the absence of the direct semantic route. Second is 'visual dyslexia' occurs due to an impaired discrimination of visually confusable letters, and similar to phonological dyslexia. The third is 'Deep dyslexia', occurs due to an impairment of grapheme-to-phoneme conversion rules while direct access to meaning is preserved; and the reverse pattern.

Deep dyslexia is one such disorder and is characterised by the marked production of semantic errors, and greater difficulty reading and repeating non-words over real words. Numerous neuropsychological and theoretical accounts have been proposed to explain their pattern of performance in deep dyslexia (e.g., Buchanan, McEwen, Westbury, & Libben, 2003; Colangelo & Buchanan, 2006; Coltheart, 1980, 2000; Morton & Patterson, 1980; Plaut & Shallice, 1993).

Several models account for deficient reading performance in deep dyslexia by positing multiple loci of damage in a dual-route system for which functionally distinct phonological and semantic–lexical pathways are postulated (e.g., Morton & Patterson, 1980; Plaut & Shallice, 1993). For example, Coltheart (1980, 2000) proposed that the deficit in deep dyslexia reflects reading with right hemisphere after lesions eliminate the use of the more linguistically inclined left hemisphere. Many other models of deep dyslexia suggest multiple loci of

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damage in the reading system (Morton & Patterson, 1980; Plaut & Shallice, 1993). Alternatively, some researchers have proposed that selection impairment in the phonological output lexicon alone can account for various types of reading errors observed in deep dyslexia (Buchanan et al., 2003; Colangelo & Buchanan, 2005, 2006; 2007; Colangelo, Buchanan, & Westbury, 2004; Katz & Lanzoni, 1992).

Deep dyslexia has generally been reported in patients with Broca's aphasia (Ripamonti et al., 2014). The impairment in deep dyslexia ultimately impedes automatic and parallel access to a stored visual word representation through visual input. From the perspective of most information processing models of reading (Coltheart, 1980, 2000; Glosser & Friedman, 1990; Saffran, 1985), the consequence of such a deficit is impairment in subsequent rapid semantic activation. The consequence of deep dyslexics is assumed to completely lack the capacity to assemble phonology. However, a selective impairment is also assumed for the semantic–lexical route and it is the extant damage to this reading system that is postulated to lead to semantic errors. Thus, according to these models of deep dyslexia, the primary deficit is an inability to process phonology, with additional deficits in the semantic system. The investigation of the integrity of the semantic system in two deep dyslexic patients supported the notion that semantics remains intact and that the disorder and associated errors arise through a selection impairment related to the failure of inhibitory connections in the phonological lexicon (Colangelo, Stephenson, Westbury & Buchanan, 2003).

WORDS ASSOCIATION AND DEEP DYSLEXIA

Coltheart (1987) reported in a single case study focuses on the remediation of single-word oral reading in an individual with deep dyslexia, an acquired disorder in which both the non-lexical and lexical reading routes are impaired, resulting in poor non-word reading, semantic errors in oral reading, visual-perceptual errors in oral reading, poor reading of functors, and imageability effects.

The previous literature (Glosser & Friedman, 1990; Martin, 1982; Plaut & Shallice, 1993) described deep dyslexia as the result of brain injury, have several deficits in word reading, and these patients are typically unable to read nonwords aloud. But another study (Buchanan, Hildebrandt, & MacKinnon, 1994) demonstrated that this is not the case. The findings show sensitivity to nonword phonology, as indicated by a pseudohomophone effect and semantic priming with pseudohomophone primes and that a deep dyslexic patient could process nonword phonology in two implicit tests. The results suggest that sensitivity to nonword phonology in deep dyslexia is common and is distinct from a purely lexical analysis.

The importance of understanding these speech processes in both normal and disordered population has been emphasized in recent literature and a clearer picture of how the phonetic characteristics of utterances impacts verbal production (i.e., reading, picture naming and/or repetition) is now emerging (Bose & Van Lieshout, 2008; Goldrick & Blumstein, 2006; Maner, Smith, & Grayson, 2000; Sadagopan & Smith, 2008; Silverberg, Vigliocco, Insalaco, & Garrett, 1998; Smith & Goffman, 2004). A case study which examines the ability to read words aloud while manipulating both the production complexity of the words and the semantic context revealed a strong interaction between word complexity and semantic blocking for reading aloud but not for repetition (Bose, Colangelo, & Buchanan, 2011). Many (Hildebrandt & Sokol, 1993; Katz & Lanzoni, 1992, 1997) have established that implicit phonological knowledge contributes to word recognition performance in deep dyslexic patients. Cumulatively this indicates automatic activation for word and nonword phonology.

HINDI LANGUAGE

The emergence and the prevalence: Hindi is a direct descendant of the ancient Indian language Sanskrit. Hindi in its present form emerged through different stages, during which it was known by other names (e.g. *Prakrit*). The earliest form of old Hindi was '*Apabhramsa*' (BBC, 2014). In India alone, an estimated 41 per cent of the population claim some form of Hindi as their mother tongue (ALS, n.d.). In addition to this, a large number of people in the country speak Hindi as a second language. India's constitution recognizes an impressive array of more than 15 different languages; however, Hindi is recognized as the official national language of the country, along with English, which is usually used for bureaucratic purposes (Kashyap, 2011). The geographical distribution of Hindi language speakers varies across the country. Native Hindi language speakers are mostly found in northern and central India in the states of Bihar, Rajasthan, Uttar Pradesh, and Madhya Pradesh etc.

The Alphabets and the scripts: The standard Hindi alphabet has 11 vowels (*swar)* and 33 Consonants (*vyanjan*) and 3 compound letters (*sanyuktakshar*). Hindi is written in Devanagari alphabet and draws vocabulary from Sanskrit. Devanagari is a form of alphabet called an *abugida*, as each consonant has an inherent vowel (a) that can be changed with the different vowel signs. Most consonants can be joined to one or two other consonants so that the inherent vowel is suppressed. The resulting form is called a ligature. It is written from left to right and has no case distinction.

Pronunciation: Hindi spelling is phonetic. Every consonant letter by itself automatically includes a short "a" vowel sound unless otherwise specified. In linguistics, this sound has a special name: "*schwa*".

Each vowel letter has two forms; first is the dependent form (*matraa*), used to indicate that a vowel (other than *schwa*) is attached to a consonant. And second is the independent form, used when the vowel occurs alone, at the beginning of a word, or after another vowel. Hindi vowels can be nasalized, that is a nasal quality is added to the vowel sound. The sign for nasalization is a small dot (ं) placed above the "clothesline." In some words containing long vowels like '*ā*' and '*ū*' (आ and ऊ), the nasalization dot is accompanied by a small moon. This sign is called '*chandra bindi*' (ँ).

A COMPARISON WITH ENGLISH

Alphabets: In comparison with English, Hindi has approximately half as many vowels and twice as many consonants. Just like European languages, Hindi is written from left to right. It's fairly easy to read Hindi. In Hindi, unlike in European languages, words are written as they are pronounced because each character has a different sound. Hindi is highly phonetic; i.e. the pronunciation of new words can be reliably predicted from their written form. This is in strong contrast to English.

Case Distinction and Articles: Hindi has no case distinction, i.e. no majuscule and minuscule letters. Consonants clusters at the beginning or end of words are more common in English than Hindi. Compared to English Hindi has weak but predictable word stress. The Hindi doesn't have articles (words for 'the' or 'a' or 'an'). There is no definite article (words for 'the') in Hindi, and the number one (1) is commonly used where in English the indefinite article ('a' or 'an') is needed.

Tenses and Gender: Hindi has tenses that similar to those used in English. However, sentence structure is different from English. Verbs always go to the end of sentences in Hindi and auxiliary verbs go at the very end of a sentence. In Hindi, unlike in English, all nouns have genders, either masculine or feminine. Adjectives and verbs change according to gender. Learning the gender aspect of Hindi grammar is usually one of the most difficult steps in learning Hindi.

The horizontal and vertical line: The horizontal line on top of letters plays an important role in Hindi. Words formed by different letters are joined by this line. The vertical line i.e. called '*Purnviram*' (**।**) is used instead of full stop (.).

Forward-looking context-sensitive rules: In French, the sounding of a letter depends in general on the letters that follow rather than on prior context (Deloche & Andreewsky; 1982). Similarly in English, before assigning an actual phonemic value to a letter unit, the immediately following context must be considered since it may modify some pre-assignment. But in the Hindi language has not any such forward-looking context-sensitive rules.

THE ROAD LESS TRAVELLED

The findings presented here are part of a broader research study aimed at developing a contextual understanding of the Hindi language acquisition in children with dyslexia (CWD). This article focuses particularly on characteristics of errors which mostly exhibit as in the case of deep dyslexia during the reading of the Hindi words. It based primarily on data obtained from CWD having Hindi first language or mother tongue. Most of the researches on deep dyslexia are a case study and in many languages carried out, for e.g. in Italian (Barbieri, Aggujaro, Molteni, & Luzzatti, 2013; Marelli, Traficante, Aggujaro, Molteni, & Luzzatti, 2011; Valiani, Spitaleri, & Fasanaro, 1988), in Welsh English (Mayer, Crowley, & Kaminska, 2006), in Arabic (Mayer, Crowley, & Kaminska, 2006), in Arabic numerals (Cohen, Dehaene, & Verstichel, 1994) in Spanish (Fernando, Valle-Arroyo, & Suarez, 1996; Ruiz, Ansaldo, & Lecours, 1994;), in Japanese (Hayashi, Ulatowska, & Sasanuma, 1985; Patterson, Suzuki, & Wydell, 1996; Sasanuma, Ito, Patterson, & Ito, 1996), in Dutch-speaking patient (Paquier et al., 1992), in Swedish speaking patient (Laine, Niemi, Niemi, & Koivuselkae-Sallinen, 1990), in English (Abeare & Whitman, 2009; Adair, Schwartz, Williamson, Raymer, & Heilman, 2000; Balasubramanian, 2000;; Buchanan, Hildebrandt, & MacKinnon, 1994, 1996; Cossu, Prati, & Marshall, 1995; Friedman, 1996; Katz & Lanzoni, 1992, 1997; Lambon Ralph, 2000; Matthews, 1991; Newton & Barry, 1997) were carried out. A cross-language study (Byng, Coltheart, Masterson, Prior, & Riddoch, 1984) described a case of deep dyslexia in a 15-year-old; right-handed male patient who premorbidly could read English and Nepalese, and another study (De Bleser, Faiss, & Schwarz, 1995) described a case who had normally acquired his native language (Flemish/Belgian Dutch) as well as a second language (French).

Unfortunately, the conceptual awareness of the prevalence of reading problems and dyslexia in Hindi speaking has not been matched with English countries. In fact, dyslexia is still not widely recognized in the world of Hindi language; and academic research on this specific condition in the region is extremely scarce. The reviewed literature clearly shown, no study on deep dyslexia have been carried out in the Hindi language, presumably not because of the scarcity of neurological disorders in the Hindi language community, but because of the lack of appropriate assessment tools. Deep dyslexia in the Hindi language is the road less travelled or almost untraveled till now.

Keeping above in mind, it is worthwhile to report the findings as of identified or examined, and also to conceptualize the findings within a model that categorise the Hindi words on the basis of errors

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similar to deep dyslexia as revealed during reading by CWD having first language Hindi.

ACCOUNT OF RESEARCH

This research study was undertaken in the city of Delhi. As per the criteria for the study, the main condition for including participants as the sample was that the children identified as dyslexic, having Hindi as a mother tongue or first language, and English as a second language in their curriculum. The age was not any criteria for participants, but the age range was between seven and a half to around twelve years with the mean value of eight and half years at the beginning of the study. All forty-six participants (twenty-five boys and twenty-one girls) were studying in the class second (one boy), third (fifteen girls and thirteen boys), fourth (nine boys and six girls), and fifth (two boys). Three participants (two girls and one boy) of the class third are left-handed; have the dominant left hand. Snowball sampling was used to gain access to participants. Having worked in the field of dyslexia in Delhi, helped investigator to establish contact with known private and public specialist (a clinical psychologist) who then referred to parents, special educators, teachers and another specialist, which; led to children with dyslexia.

The observations of the participants were carried out throughout an academic year as per the schedule. The schedule was designed to cater to a minimum of two observations per month to every child in their schools. An interaction with teachers was followed by the observation made to develop a deeper understanding of the errors in the reading of Hindi and or Hindi words. The observations range from one or two periods (sometimes continuous) on the same days.

The discussion with the respective teachers was followed up after the observations to get the clear idea about the nature of errors which get happen naturally by these participants. After getting the details idea about these errors a list of words was prepared which was very particular and specific to every individual participant. Then individual reading sessions were organised for every participant. In the individual reading session, the selected words (from the textbook) was displayed or written on the blackboard/whiteboard and participants were asked to read. And, the participant(s) was/were also asked to read the same selected Hindi words directly from the textbook. Many time many of the participants wished to read their own storybook instead of the selected text. It was also found that they have more love to read a storybook with full of the pictures over the textbook. So, their wishes were always welcomed unconditionally. The details of reading errors were noted down. Where the participants failed to identify the words or admitted that not knowing any word then the proper hints were also provided. The mistakes due to unawareness were not considered as the required data. The errors which happened in the flow of reading were only considered as the data.

The reading sessions ranged from half an hour to an hour, but not bounded to any minimum time duration and had had the option to take pause and/or rest. They were free to leave the reading session at any moment and/or also to reschedule and/or to terminate if felt uneasy or restless or tired. The nature of the adopted approach was informal and relaxed. All the collected data were transcribed to analyse inductively (as suggested by Neuman, 2014) with the help of scholar/academics who have expertise in the Hindi language. The close attention was given to identifying the linkage like similarities and differences, coherence and incoherence.

The study followed the APA Ethics Committee Rules and Procedures as published by the American Psychological Association (APA, 2016). Informed consent was obtained prior to the starting the observation for data collection as well as prior to interactions. The selected participants and their related educators/teachers were made aware of the nature of the study. If a child became distressed or emotional and/or felt uneasy or restless or tired during the course of data collection (here reading of Hindi text), a pause in the proceedings was taken, and the option of rest and/or reschedule and/or terminating and/or withdrawing from the study was always offered.

FINDINGS

The findings are organised under five themes. These five themes are been formed by keeping in mind the coherence among language, meaning and orthography of the words. The first is ‘Similar meaning and same language’. Mostly the synonyms words come under this category. The second is ‘Similar meaning but different language’; words having similar meaning but originally belong to different languages came under this category. The third category is ‘different orthography and different meaning but shares relationship’; deals with the words which are related to each other in one or more ways. The fourth is ‘different words with some resemblance in orthography but differ in *matraa*’. The final theme, ‘incoherent’ captures the words which do not come under any of the four and expressed incomprehensibly or unclear. The Hindi words identified as errors similar to deep dyslexia as accousted by the children with dyslexia is presented below in the table and followed by the discussions of the findings.

Table1. List of the words explored as an error similar to deep dyslexia observed during reading session(s) of the CWD

Hindi Words in Devanagari script (*) [**]	Read/accosted wrongly (*) [**]
रुमाल (*rumal*) [handkerchief]	हैंकि (*hankie*) [Handkerchief]
कुत्ता (*kutta*) [dog]	डॉगी (*doggy*) [dog]
गाड़ी (*gaadi*) [van]	बस (*bus*) [bus]
	कार (*car*) [car]
कमीज़ (k*amij*) [shirt]	शर्ट (*shirt*) [shirt]
टेलीफोन (*telephone*) [telephone]	फ़ोन (*phone*) [phone]
	मोबाइल (*mobile*) [mobile]
कलम (*kalam*) [pen]	पेन (*pen*) [pen]
चिड़िया (*chidiya*) [bird]	पंछी (*panchhi*) [bird]
बन्दुक (*banduk*) [gun]	पिस्तौल (*pistol*) [pistol]
किताब (*kitaab*) [book]	कॉपी (*copy*) [copy]
	नोटबुक (*notebook*) [notebook]
समाचारपत्र (*samacharpatra*) [newspaper]	अख़बार (*akhabaar*) [newspaper]
झोला (*jhola*) [bag]	झूला (*jhula*) [swing]
	थैला (*thaila*) [bag]
दवात (*dawaat*) [inkpot]	स्याही (*syaahi*) [ink]
दीया (*diyaa*) [lamp]	दीपक (*deepak*) [lamp]
ईंट (*eent*) [brick]	ईंटा (*eenta*) [brick]
	पथ्थर (*paththar*) [pebble]
चालक (*chalak*) [driver]	चालाक (*chalaak*) [clever]
सड़क (*sadak*) [road]	रास्ता (*rasta*) [path]

*(pronunciation in Hindi), **[Similar equal in English]

Similar meaning and same language (Different in orthography but the similarity in meaning): This section is related to synonyms words; which have different spelling or orthography but similar to their meanings and originally belong to the same language. The analysis the data reveals that few Hindi words were pronounced wrongly (as in the case of deep dyslexia) by some of the participants are synonyms. Here as per findings, the words like '*chidiya*' read wrongly as '*panchi*', '*samacharpatra*' read wrongly as '*akhabar*', '*diya*' read wrongly as '*deepak*', '*eent*' read wrongly as 'eenta' or '*paththar*', '*jhola*' read wromgly as '*thaila*' '*telephone*' read as '*phone*' or as '*mobile*', '*sadak*' read wrongly as '*rasta*'. These paired words (*chidiya* → *panchhi*, *samacharpatra* → *akhabaar*, *jhola* → *thaila*, *diyaa* → *deepak*, *eent* → *eenta*, *sadak* → *rasta*) are different in spelling or orthography but have similar meaning and originally belong to the same language i.e. Hindi.

Similar meaning but different language: This section is related to the words having similar meaning but not from the same language. The analysis of collected data reveals words like '*Kamij*', '*kalam*', and '*rumaal*' come under this category. The Hindi word '*kamij*' was read wrongly as 'shirt', word '*kalam'* was wrongly read as 'pen', and the word '*rumaal*' was wrongly read as 'hankie'. The word 'shirt', 'pen', and 'hankie' or 'handkerchief' have similar meaning to the Hindi word '*kamij*', '*kalam*' and '*rumaal*' respectively. These (shirt, pen, and handkerchief) are English words which do not originally belong to Hindi but used frequently in daily conversation than their Hindi similar(s).

The argument behind this kind of reading mistakes is that in our daily life we use the English words like 'pen', 'shirt' more frequently instead of their respective Hindi similar like '*kalam*', and '*kameej*'. There are many words which do not originally belong to Hindi but more frequently used in daily conversation than their Hindi similar. This more frequent uses of English words than their Hindi similar in daily conversation can be one of the reasons behind this kind of the error during the reading of the words.

Different orthography and different meaning but share relationship: This section is related to the words; which are different with their meaning as well as orthographically and not having any similarity but share some kind of the relationship or attachment. The Hindi words having different orthography and different meaning but closely attached or related falls under this category. The Hindi words of this category are attached or related to each other in one or more way. Like the Hindi word '*banduk*' (gun) was read wrongly as '*pistol*', are related to each other with their way of utilisation and functioning. The Hindi word '*dawaat*' was read wrongly as '*syaahi*', are similar to the English word 'inkpot' and 'ink' respectively and sharing a very direct relation with each other. Similarly, the word '*kitaab*' was read wrongly as '*copy*' or as '*notebook*'. The word '*kitaab*' is Hindi similar to the English word 'book'. All these three words '*kitaab*', '*copy*' and '*notebook*' very directly related to each other by utilisation and functioning.

Different words with some resemblance in orthography but differ in matraa: This section is related to the Hindi words, which have different meaning but show resemblance up to some extent in orthography or spelling. This different is sometimes very minute. Many Hindi words having different meaning only due to their '*matraa*' even main alphabets are the same. This difference in '*matraa*' changes the meaning of the word. Many of the time mistakes occur in this kind of Hindi words because the main structure seems similar due to having same alphabets and further it resultant into less attention on the '*matraa'* attached to them. And another reason is fluency to keep on reading with the pace the sufficient attention not properly given and to keep continue reading at the same pace the mistakes related to this kind come into the picture.

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In the collected data words like '*jhola*' and '*chalak*' come under this category. The Hindi word '*jhola*' was read wrongly as '*jhula*', and the Hindi word '*chalak'* was read as '*chalaak*'. The Hindi word '*jhola*' and '*jhula*' differs in meaning ('bag' and 'swing' respectively) but in pronunciation have very resemblance with only different in 'matraa' i.e. '*o*' and '*u*'or '*ū:*'. In the Hindi words '*chalak*' and '*chalaak*' different is in the pronunciation of only *matraa* '*a*' and '*ā*' but meaning totally different i.e. 'driver' and 'clever' respectively.

Incoherent: This section is considered for the errors of Hindi words which do not come under any one of the above and also not having any kind of pattern or words without any logical or meaningful connection. It deals with all words which are found or expressed in an incomprehensible or confusing way or unclear or spread out irregularly in various directions. Any meaningful word read as like non-words (a meaningless word) is also under this category. During the data collection, the reading of non-words was not tested because it was not in the focus of the study. So, this category lacks the examples here but considered by keeping the view of the possibilities as felt during analysis of the collected data.

DISCUSSION AND CONCLUSIONS:

A specific pattern of reading characterised by the prominence of semantic errors (e.g. cow → sheep), co-occurring with visual (e.g., poon → spoon), morphological errors (e.g., child → children), and substantial expressive problems showed by patients with deep dyslexia (Marshall & Newcombe, 1973). Here the above findings are classified into five themes have the similarity with the specific pattern of reading as characterised by Marshall and Newcombe (1973). The first theme; 'similar meaning and same language different word/ different in orthography but the similarity in meaning' and the second theme; 'similar meaning but different language' have similarity with the 'semantic errors'. The errors (*chidiya → panchhi*, *samacharpatra → akhabaar*, *jhola → thaila*, *diyaa → deepak*, *eent → eenta*, *sadak → rasta*) are semantic and come under the first theme (similar meaning and same language different word) because of similar meaning or synonym and belongingness to Hindi. The errors (like; *rumaal → hankie*, *kutta → doggy*, *gaadi → bus*, *gaadi → car*, *kamij → shirt*, *kalam → pen*) are semantic and come under the second theme because of similar meaning or synonym but belongingness to two different languages Hindi and English. The error '*telephone → phone*' is clearly a semantic error but come under both of the themes because "Hindi has incorporated numerous English words However, the pronunciation of many of the loan words has changed in Hindi" (F.I.S, n.d.). The Hindi equal for the word 'telephone' is '*durbhash*', but the word 'telephone' or short form 'phone' is used in day to day life by native Hindi speakers very frequently in their conversation. So the word 'telephone' is a part of Hindi dictionary also.

The third theme (different orthography and different meaning but share relationship) is a kind of both 'semantic errors' (coltheart, 1987; Marshall & Newcombe, 1973) as well as 'co-occurring with visual' (Marshall & Newcombe, 1973) and/or 'visual-perceptual errors' (Coltheart, 1987) side by side. The error (*telephone → phone*) is very kind of co-occurring with visual. An intensive analysis indicate clearly that these (*kitaab → copy*, *kitaab → notebook*, *banduk → pistol*, *telephone → mobile*, *dawaat → syaahi*) have visual resemblance with their shape and size and/or sharing any kind of relationship (direct/ indirect) and/or related to each other in one or more ways like; way of utilisation and/or functioning.

And the fourth theme (different words with some resemblance in orthography but differ in '*matraa*') has similarity with 'morphological errors'. The errors like; '*jhola*' → '*jhula*', '*chalak*' → '*chalaak*' came under this category because of having very similarity in their spelling at first look but different due to the '*matraa*' attached to the alphabets. And the analysis unfold that these errors are having totally different meaning without and do not share any kind of relationship.

The semantic errors in oral reading (Coltheart, 1987; Marshall & Newcombe, 1973) remains intact (Colangelo et.al., 2003), help in shaping of the model to categorise the errors (similar to the phenomenon of deep dyslexia) Hindi, and also supported by a recent study (Boumaraf & Macoir, 2015) that described "the Semitic languages like Arabic have particular graphic features allowing the assessment of the influence of global word form on manifestations of deep dyslexia. The reading of Arabic relies on the global visual word form when the phonological route no longer functions, as in deep dyslexia".

Another very vital view was expressed that "deep dyslexia occurs due to an impairment of grapheme-to-phoneme conversion rules while direct access to meaning is preserved" (Marshall & Newcombe, 1973). A discern on the data indicate that most of the errors (e.g. *rumaal → hankie*, *kutta → doggy*, *gaadi → bus*, *gaadi → car*, *kamij → shirt*, *telephone → phone*, *kalam → pen*, *chidiya → panchhi*, *samacharpatra → akhabaar*, *jhola → thaila*, *diyaa → deepak*, *eent → eenta*,) showed that the "meaning is preserved". But this is not the only case, and it becomes clear from the rest of the errors (*telephone → mobile*, *banduk → pistol*, *kitaab → copy*, *kitaab → notebook*, *jhola → jhula*, *chalak → chalaak*, *dawaat → syaahi*, *sadak → rasta*). An abstraction of these errors (meaning is not preserved) connotes two categories; one having resemblance and/or some relationship (*telephone → mobile*, *banduk → pistol*, *kitaab → copy*, *kitaab → notebook*, *dawaat → syaahi*, *sadak → rasta*), and another hasn't (*jhola → jhula*, *chalak → chalaak*). So it is clear that the preservation of meaning is a noble characteristic but other aspects can also be possible i.e. 'change/variation in meaning'.

In the fifth theme i.e. 'incoherent' is considered according to the previous literatures (Glosser & Friedman, 1990; Martin, 1982; Plaut & Shallice, 1993) that described: "deep dyslexia as the result of brain injury, have several deficits in word reading, and these patients are typically unable to read nonwords aloud". This reading impairment characterised by the inability to read non-words (Coltheart, 1980; Shallice & Cooper, 2013). The reading of existing words was influenced by the degree of imageability and concreteness (Shallice & Cooper, 2013), and in this study no data collected for the nonwords, so it lacks the further analysis.

A case study (Barbieri et. al., 2013) of the reading performance revealed that deep dyslexic read nouns significantly better than verbs; moreover, her performance was better on unergative than on transitive verbs, whereas the comparison between unergative and unaccusative verbs did not differ significantly. Coltheart (1980) also said that reading impairment also characterised by grammatical class (part of speech) effects. From the point of view of parts of speech, it is clear that almost all words are noun except one adjective i.e. '*chalaak*' (clever). The present study has the mainly the nouns and not any other parts of speech.

The conclusion of a recent study (Shallice & Cooper, 2013) was that the reading of existing words was influenced by the degree of imageability/ concreteness, and high imageability words were read better than low imageability. The errors (*rumaal* → *hankie*, *kutta* → *doggy*, *gaadi* → *bus*, *gaadi* → *car*, *kamij* → *shirt*, *telephone* → *phone*, *telephone* → *mobile*, *kalam* → *pen*, *chidiya* → *panchhi*, *banduk* → *pistol*, *kitaab* → *copy*, *kitaab* → *notebook*, *samacharpatra* → *akhabaar*, *jhola* → *thaila*, *dawaat* → *syaahi*, *diyaa* → *deepak*, *eent* → *eenta*, *sadak* → *rasta*) are concerned with the degree of imageability. For example, it could be argued that at the time of reading the word '*dawaat*' (inkpot) its use was in the imagination, and the semantic errors took place. It could be argued that this kind of semantic errors happened with above words due to the high degree of imagination and focusing on the given picture simultaneously during the reading text.

It is also very important to mention that the participants are unique with their errors. And the degree of this kind of uniqueness is very high. All the listed errors of table 1 are not found in all of the participants. The similarity in errors was found very less among the participants. Anyone had shown a kind of error and another one shown another kind of the error. For example, the Hindi word '*gaadi*' was wrongly read by two participants into two different ways. One is '*gaadi → bus'*, shown by a participant and another is '*gaadi → car*' by a different participant. But both of the participants remained regular with their way of errors and never shown exchange in the pattern of errors. The findings are very similar in the case of other errors like '*kitaab → copy*, *kitaab → notebook*'. It indicates that errors are very particulars or subjective and the commonality is the pattern of errors and regularity in the pattern of errors.

In summary, the present paper concluded the findings as follows:

1. The prominence of semantic errors, co-occurring with visual and morphological errors also the presence as of errors (similar to in the case of deep dyslexia) in Hindi. And the semantic errors in Hindi have more categorical characteristics than English.

2. As many study discussed that these errors occur due to an impairment of grapheme-to-phoneme conversion rules while direct access to 'meaning is preserved'. But in Hindi this is not the only case, meaning is preserved in one type of case and meaning is also changed (not preserved) in another type of the case.

3. The role of the imageability is also found vital in Hindi reading and it is in congruence with the statement 'high imageability words were read better than low imageability'. The given picture in the book along with the text helps in understanding but also plays an important and capacious role to lead the errors during reading. As a reason, it could be argued that in such case the image processes faster than the text and error like 'similar meaning but different in orthography' is occurred.

4. In the case of reading Hindi word by CWD, at one side the errors in reading Hindi words are specific, subjective, and particular, and on another side the commonality and regularity in the pattern of errors exhibit.

FUTURE DIRECTIONS

The semantic errors (when reading existing words), as well as grammatical class (part of speech) effects (Coltheart, 1980), are characterised in the case of deep dyslexia. The case study (Barbieri et. al., 2013) concluded that deep dyslexic read nouns significantly better than verbs; moreover, her performance was better on unergative than on transitive verbs, whereas the comparison between unergative and unaccusative verbs did not differ significantly. An extensive inclusion of all the parts of speech will vindicate to provide more comprehensive understanding of the blueprinting of reading errors similar to deep dyslexia. The report resultant into the conceptualization of errors similar to deep dyslexia during the reading of Hindi words by CWD, and can be used as the source of information for researchers, teachers and learners. The present study has only sketched the surface, hoping to convey some picture of how one might study language as a natural object,

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where such inquiry has led, and what kinds of problems lie on the horizon.

The errors reported came to be seen as learners' attempts at using new structures, thus developing their language knowledge, and the need is to 'reconceptualise as learning steps' (Edge, 1989). In fact, errors were important sources of information for researchers wishing to uncover the mysteries of the language learning process and for teachers to inform their teaching as well (Corder, 1981). While dyslexia and related reading difficulties are often associated with poor long-term academic achievement, there is good evidence that early recognition together with an individualized instruction such as increasing phonological awareness can change the course to the better long-term effect on academic achievement (Aboudan, Eapen, Bayshak, Al-Mansouri, & Al-Shamsi, 2011). The teacher can use the learners' errors as feedback on the development of the students' language competence. Errors can indicate how successful learners have managed to incorporate a new structure (Corder, 1981). Then, the teacher can modify the material or teaching methods accordingly. A good example of the teacher accepting students' errors as part of the language learning process is teaching communication strategies (Kálmos, 2011). Some notable progress got initiated in this direction like; the number of special schools has grown steadily, especially in urban areas' (Singal, 2008), there has been an increase in government grants to support such schools (Singal & Jeffery, 2011), and the government schools cannot deny the admission of any child (MHRD, 2011). But some big concerns are also present like; the interest behind admitting children with disabilities by private schools is 'help and welfare' (Jha, 2010). Special schools are mainly run by non-governmental organisations, voluntary organisations and trusts, and provide educational and vocational training, and mostly situated in the urban area of the country. So the parents residing in metro have the privilege to send their children to special school and the parents residing in rural area have not the option of any special school (Johansson; 2016). All these indicate that in our country India, harnessing the benefit of the errors as learning steps is a big challenge to achieve with the existing educational structure and system but nevertheless, the journey is moving ahead.

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