Phonic Skills amongst High and Low Academic Achievers in English and Bengali

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Abstract- Phonics skills are considered to be the predictors of reading disability, which is off late viewed as a language based disorder. The aim of the present study is to compare the phonics skills of high and low academic achievers across Bengali and English. A checklist consisting of three parameters was developed in both the languages to assess phonics skills. A total of 42 normally developing bilingual females who attended standard three to standard five in the age range eight to eleven years participated in the study. The participants were classified as high and low academic achiever based upon school performance. Significant differences were found in all the phonics skills in both the languages except vowel sound skill in Bengali and letter name in English. It is concluded that phonics tasks should be provided importance and during classroom curriculum as it distinguishes between high academic achievers from the low academic achievers.

Index Terms- Academic achievers, Phonics, Bengali, English, High and low academic achievers.

I. INTRODUCTION

Scholastic problems affects about 5-15% of the Indian school going population who have dropped out of school or at risk of being school dropouts (Sangeeta and Sakhuja, 2004; Thacker, 2007). Reading research in the past three decades has confirmed the complex but symbiotic relationship that exists between reading and writing and oral language (Butler & Cheng, 1998), the reading and spelling errors in children with learning disabilities are preceded by errors in oral skills and histories of slow language growth (Catts and Kamhi, 1999; Roth and Spekman, 1989). Thus a speech language pathologist has a role to play in identifying and preventing the reading difficulties before they present themselves with typical errors (American Speech-Language-Hearing Association, 2001; Justice and Kaderavek , 2004) of letter reversals, reading and spellings.

Off late in the technological society, formal education primarily imparted in schools, has become essential to social and economic success (National Reading Council, 1998, Leu, 2000., Kirby, 2003, Lacey, 2010). Keeping this in view, the Indian constitution ascertains free and compulsory education for all till the age of 14 years (Ministry Human Resource Development 2005). To achieve the target of "Education for all" it's not just enough to admit children in schools but also to avoid school dropouts. In a study at Cochin 58.8% of 1,310 cases of poor school performance had learning difficulties John (2003). Researchers (Mathes and Denton, 2002, Kirby, 2003) have demonstrated that reading weakness can develop into dyslexia or a reading disability when neglected. Nevertheless early identification and intervention studies, both small and large scale, confirm that the course of reading disabilities can be reversed (Swank & Catts, 1994; Swank & Larivée, 1998; Stuart, 1999; Hiebert & Taylor, 2000; Hus, 2001, Berninger, Vermeulen, Abbott, McCutchen, Cotton, Cude, Dorn, Sharon, 2003) and they can learn effectively. Irrespective of the orthography one of the major skills which decides capability to read and spell is associating sounds with their written representations i.e. phonics. And inability of the child to do the letter to sound mapping which would inhibit the child to read and spell (Goswami, 2005). Research suggest that the most powerful predictors of later reading success are letter name knowledge and phonological awareness (eg /cat/ starts with which sound) (Bond and Dykstra, 1997; Ehir and Wilce, 1980, 1985; Chiappe, Siegel and Gottardo, 2002). When a child is asked to spell or to name how a letter sounds the child has to think about and consciously manipulate language, this skill is often refered to as a metalinguistic skill (Tunmer, Pratt, and Herriman, 1984). Amongst the metalinguistic skills metaphonological skills (phonics and phonological processing) are best correlated with reading achievements (Catts, 1993; Gillon 2002).

Learning phonic skills like the correspondences between letters and speech sounds of a language is a crucial step in reading acquisition, failure of which is thought to account for reading problems in developmental dyslexia (Frith, 1985). Assessment tools like Scholastic Red (2000) assess phonics under three parameters viz alphabetic skills, reading and decoding skills and spelling skills. Although quiet a bit of work has been done in English to facilitate acquisition of literacy and how the deficits in phonics affect linguistic comprehension and production there is a dearth of research in any Indian languages in this area (Kumar & Karanth, 2006). Kumar and Karanth contraindicate the practice of using conclusions of western studies to Indian languages. The two languages are different and have different neural representations (Kumar, Das, Raju, Bapi, Padakannaya, Joshi and Singh, 2009). An alphabetic system and a linear writing system such as English script represents language at the level of phonemes and has one of the most opaque orthography (Eng, 2002; Goswami, 2002). Indian systems of writing, that have a common source of origin in Brahmi, are non linear, alphasyllabic (Bright, 2000, Karanth, 2003, Kumar et. al, 2009) and have a transparent orthography (Karanth, 2003a; Mishra and Stainthorp, 2007). The Bengali cursive script is with 11 vowel graphemes denoting the independent form of 9 vowels and two diphthongs, and 39 consonant graphemes which are used to represent 32 consonant phonemes whereas in English 26

letters are used to represent 44 phonemes (Honeybone & Watson, 2006) which clearly indicates that grapheme to phoneme ratio is less in English as compare to Bengali leading to a confusion in spelling in English. Ligatures and more number of graphemes place extra demand on Bengali reader. Features such as irregular words which are a perennial source of difficulty for the reading disabled child are far less in Indian scripts (Karanth, 2003b). For instance in Bengali, among vowels, only two vowels have their variation in pronunciation (Chakbrorty,1994) whereas in English five vowels have multiple variation in pronunciations. Thus Bengali has more (44) number of aksharas which are visually complex as compared to 26 English alphabets however the phoneme grapheme variation in English is much more ad compared to Bengali. Thus children are expected to exhibit varying difficulties in learning and processing the two languages.
 School teachers are the first professionals to encounter a poor academic achiever. They often assign academic under achievement to restlessness or as a result of poor attention of the child and parents towards academic issues. Teachers need to be sensitized towards the fact that children with deficits in metaphonological skills, especially phonics and phonological processing often emerge as poor academic achievers or reading disabled children. It may thus be hypothesized that high academic achievers have better in phonics as compared to their low achieving peers.

The aim of the study is to compare the phonic skills of high and low academic achievers (8-12 years) in Bengali and English and to identify if certain parameters differ significantly across the two groups.

II. METHODOLOGY

Participants

The participants of the present study comprise 42 females from Kolkata, who were matched for there age, sex, language exposure and neighborhood. The participants were in the age range of 8-12 years (mean: 10.07 years SD 1.1) and attended class III to class V in an English medium school managed jointly by both the private and government bodies. The two selected schools were in the middle class areas and followed similar teaching methods for both the languages, which was predominantly look-and-say as usually followed across the state and the neighboring state of Odisha (Mishra and Stainthorp, 2007). They were classified under two groups, as high academic achievers and low achievers. High achievers scored 75% or more marks in their academic performance and low achievers scored 35% or below in their academic performance (Shenoy and Kapur, 1996). The selection of the participants was done after seeking informed consent from parents and school authorities. The participants parents were interviewed about the linguistic environment at home, literacy activity exposure at home, their educational and occupational background during two of the parents day meets. Every effort was made to control the variables (spoken language, socioeconomic background, educational level of parents) when selecting the final pool of parents. All the participants were Bengali speakers (L1) and used it as the primary language for communication at home and neighborhood. In addition their parents indicated that the children had attended formal education since 4 years of age and had been to lower KG

and Upper KG where they were exposed to Both English and Bengali. All the participants were native Bengali speakers and belonged to the middle income group. Both the languages were used at schools however standard colloquial Bengali was predominantly the mode of communication at home and the neighborhood. English was used at home especially during the completion of home work assigned from the school. All the parents were literate, had were graduates and could understand both the languages nevertheless were proficient in Bengali as compared to English. The children and were exposed to formal Bengali and English since their pre-school ages. Equal number (n=7) of high achievers and (n=7) low achievers, 14 students from each class (III, IV and V) participated in the study. The participants were screened out for the presence of hearing loss, oromotor deficits, uncorrected visual deficits or any mental retardation.

III. MEASURES

Standardized measures

The tools used for this investigation included two measures; WISC-R (Weschler, 1974) and hearing screening using transient evoked otoacoustic emission (MACO- Ero Scan). The WISC-R is a standardized intelligence test administered to children individually. It contains two different scales composed of a series of subtests that give two types of IQ scores: a Verbal Scale IQ and a Performance Scale IQ. In addition, the test gives an overall intelligence quotient, a Full Scale IQ. The transient evoked otoacoustic emission was done using Maico Ero Scan hand held OAE in an acoustically treated room. The standard recording parameters was used for recording and analysis of results. The pass criteria for signal to noise ratio is 5dB or more than 5dB in three or more frequency regions. Oromotor skills were assessed informally through the examination of cranial nerve no. V, VII, IX, X and XII.

Experimental measures

Two experimental measures to evaluate phonic skills in English and Bengali were developed for the study. Descriptions of the experimental measures are as follows:

Three sub-parameters which were considered under phonics include alphabetic skills, reading and decoding skills and spelling. The three parameters asses the letter and sound correspondences which are crucial skills to understand and to use association of graphic signs and phonological sequence within words (Etchepareborda, 2003, Gray   and Mccuthen, 2003), training in these areas accelerates reading acquisition (Hindson, Byrne, Fielding-Barnsley, Newman, Hine, Shankweiler, 2005 and Swanson, Howard, and Saez, 2006). The Scholastic Red, 2002 was used for assessing English phonic skills and the Bengali checklist was developed based on the guidelines of Scholastic Red. The alphabetic skills were evaluated by three tasks which required the participant to name the letters in the upper case in the first sub test followed by naming the consonant sounds and vowel sounds in the next two subtests. The participant received a correct score and was awarded one point for an item. They were instructed for the test in Bengali and English in the following manner:

This is a game where we read letters (The upper case letters in English and Bengali letters were shown). Now let's do it together with these letters. Remember, now you have to read the letters with me; D, Q, A etc. in English and ব (b), ভ (bʰ), এ (e) etc. in Bengali. Some letters may be difficult however give them a try. In case you cannot understand how to pronounce it, need not worry try any of the letters you can.

For the next two sub tests of consonant sounds and vowel sounds the child is instructed as:

Look at these letters (lower case consonants and vowels are shown). Can you tell me the sound each letter makes? The examiner shows the letters d,l,w,r,o,a etc. in English and প (p), ধ (dʰ), ক (k), উ (u), ই (e), আ (a) etc. in Bengali and produces the corresponding sounds of the letters. It's now your turn to show me how the letters sound, are u ready for it.

For the reading and decoding task the candidates were instructed in the following manner:

This is a game where we read words (The real and pseudo-words were shown). Now let's do it together with these words. Remember, now you have to read the words with me; Let, Hog, Stop etc. in English and হনহন (hɔnhɔn), স্টল (stɔl) etc. as their corresponding word in Bengali. Some words may be difficult however give them a try. In case you cannot understand how to pronounce it, need not worry try any of the words you can.

For the spelling task the candidates were instructed in the following manner:

Now I will read few words, after every word you will write down the first sound you hear. Let's start the game together. Remember, now you have to write the words with me; Pen, Map etc. in English and পেরেক (perek), ম্যাপ (mæp) etc. as their corresponding word in Bengali. Now it is your turn to show me in writing the how the words sound first. Are you ready for it?

Detail the test construction

The letter name, consonant sounds and vowel sounds under phonics skills include the different fifty consonant and vowel letters, thirty consonant sounds, six vowel sound and three alternative vowel sounds respectively in Bengali and twenty six consonant and vowel letters, seventeen consonant sounds, five long vowel sounds and five short vowel sounds respectively in English. They were randomized in presentation. The reading and decoding skills under phonics skill are arranged under three subheadings; short vowels in CVC words, consonant blends with short vowels and r and l influencing previous vowels. Under each subheadings both real and pseudo words have been taken into consideration in both the languages. Under the first subheading i.e., short vowels in CVC words, the short vowel is the primary

focus in word construction. Therefore, to keep the complexity of the word same in both the languages and also keeping in view the smearing effect which plays a crucial role in auditory processing the initial consonant with following vowel i.e., CV portion of the word were kept constant in both the languages keeping in consideration that process to acquire first language and second language is different specified by dialects of particular state or country or geographical boundary. For example, in the word '*le*t' in English and '*le*ʤ' in Bengali the CV portion '*le*' are kept constant. Similarly, under the subheading consonant clusters with short vowels, the consonant clusters with following or preceding vowel for example, '*cli*p' in English and '*cli*b' in Bengali and under subheading /r/ and /l/ influencing previous vowels /r/ and /l/ with either preceding or following vowels were kept constant in both the languages, for example, 'b*ark*' in English and 'bal*ark*' in Bengali. In spelling skills initial consonant with the following vowel and final consonant with the preceding vowel have been taken into consideration, for example pen in English and 'perek' in Bengali.

The maximum possible scores for phonics skills are one hundred thirty (130) in English and ninety four (94) in Bengali.

The words selected for the Bengali checklist were from the standard 1st and 2nd text books followed in West Bengal Board of Secondary Education keeping in mind that the participants for the present study belong to standard 3rd, 4th and 5th. English words were from 1st and 2nd standard test books prescribed by Central Board of Secondary Education. The nonsense words and sentences were constructed with the help of a clinical linguist who had a 20 years experience in working with both the languages. A face validity and test retest scoring was done prior to the finalization and application of the checklist. The face validity of the checklist was done by three speech language pathologists and three clinical linguists with a ten years or more experience of working with children having language and speech disorders. Each item was rated on a two point rating scale (0 – rejected, 1- included). The items which were significantly rated as 1 (p< 0.05) were considered for the checklist.

Reliability study

The experimental measure was pilot tested on forty primary school goers (Standard III to V) who were not included in the study. The test was re-administered in a gap of fourteen days. The measures of reliability were applied on the data. Test retest reliabilities are reported on table 1.

Table 1: Test-retest reliability for experimental measures (n= 40)

SL NO.	Skills	Sub parameters	Bengali (r)	English (r)
		Letter Name	.99	.99

SL NO.	Skills	Sub parameters	Bengali (r)	English (r)
1.	Phonics skills	Consonant Sounds	.93	.99
		Vowel Sounds	.91	.99
		Reading and Decoding skills	.99	.99
		Spelling skills	.99	.99

IV. PROCEDURE

Each participants were administered the test battery individually in a prearranged manner. The procedures employed for each of the experimental measures were as follows. Exemplars were provided and the correct responses were reinforced. Demonstration and practice items were administered until the participant could express correct independent performance on one item following which the test trail was run. The measure was administered one to one in a quiet room. For each correct response was awarded as score one. The responses were immediately rated as correct or wrong by the co investigator on the scoring sheets. All of their verbal responses were audio-tape recorded.

The only item which differed in both the checklists was maximum possible scores on alphabetic skills. In Bengali there are 50 alphabets while in English there are 26 alphabets. To compare the total score obtained in both the languages percentage of mean scores were considered. Statistical analysis was done using the SPSS (Statistical Package for Social Sciences) software (version 17.0).

V. RESULTS

After the measures were administered to all the participants their responses were recoded, scored and subjected to a series of statistical analysis. The results have been discussed under two subheadings; Firstly, the comparison of performance between HA and LA, and secondly, the comparison of performance between two languages.

The comparison of performance between HA and LA

The performance of HA and LA has been analyzed using three statistical tests; percentage of mean scores, standard deviation and chi-square test. The maximum possible scores on alphabetic skills in Bengali were not same as English. To compare the total score obtained in both the languages percentage of mean scores only for alphabetic skills were considered.

Percentage of mean scores:

It is clear from the table no. 2 and fig. 1 and 2 that the mean percentage scores of HA is higher in all skills than LA in both the languages.

Table 2: Mean and standard deviations of the scores obtained by high and low achievers in Bengali and English

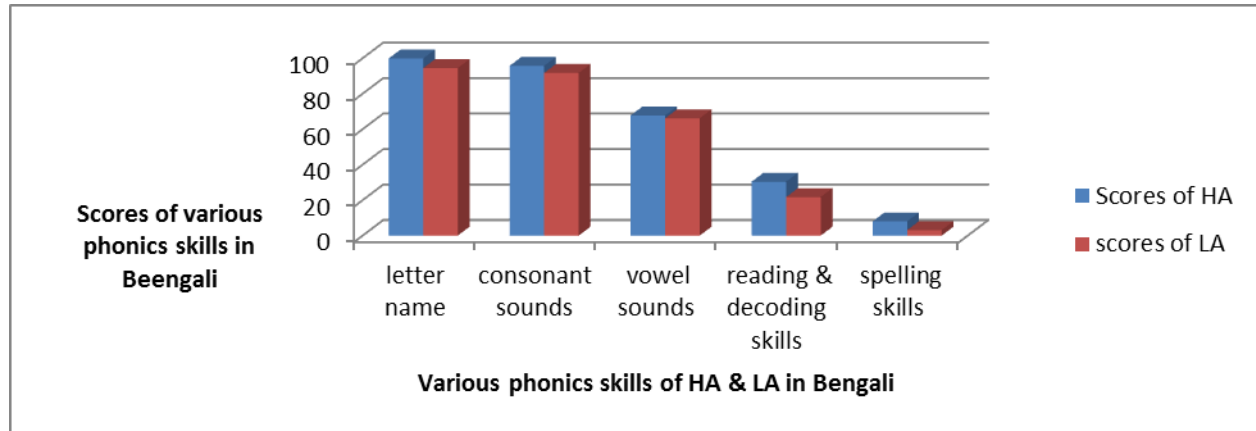| Skills	Sub parameters	Bengali (Mean ± SD)		English (Mean ± SD)	
		HA	LA	HA	LA
	Letter Name	99.809%± .601	94.380%± 5.817	100%± 0	96.703%± 7.815
	Consonant Sounds	95.684%± 1.555	91.666%± 4.231	88.795%± 1.769	50.139%± 39.748
	Vowel Sounds	67.718%± 3.341	66.130%± 4.268	84.761%± 6.015	28.571%± 28.685
	Reading and Decoding skills	30.380± 1.961	21.714± 4.659	29.904± 0.538	12.476± 5.938
Phonics skills	Spelling skills	8± 0	3.095± 1.841	7.904± .30079	4.333± 1.983

Fig 1: Mean percentage scores of various phonics skills of HA and LA in Bengali
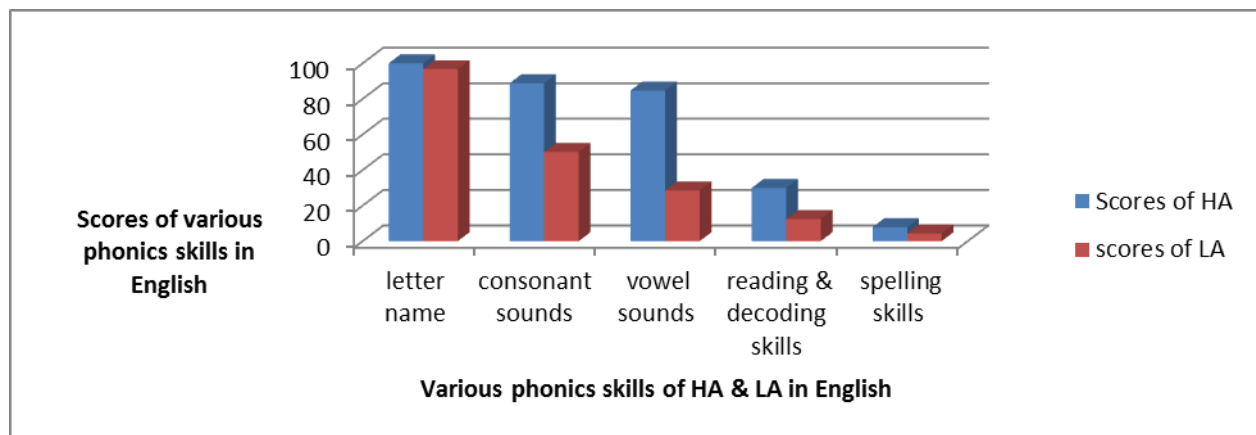

Fig 2: Mean percentage scores of various phonics skills of HA and LA in English

Chi- square test:

The scores obtained in phonics by high and low academic achiever in Bengali and English has been compared as a whole as well as across the sub parameters. There was significant difference (p= <.05) between the performance of high and low achievers in total scores of phonics in both the languages.

Significant difference (p< .01) in Bengali among the low achievers and high achievers were obtained for sub parameters (table 3) including letter name, consonant sounds, reading and decoding skills and spelling skills. Vowel sounds is the only parameter in Bengali phonics skills, which had no significant difference (p> .05). On comparing the scores obtained by high achievers and low achievers for the language English, significant differences (p< .01) were found for consonant sounds, vowel sounds, reading, decoding skills and spelling skills. In English, no significant difference (p> .05) was found in letter naming skill (table 3).

Table 3: Result of chi-square test to compare the performance of low and high academic achievers in various sub-parameters of Bengali & English phonics and phonological processing skills

SKILLS	SUBPARAMETERS	BENGALI	ENGLISH
	Letter name	* .018	.352

Phonics skills	Consonant sounds	* .002	* .002
	Vowel sounds	.307	* .000
	Reading and decoding skills	* .001	* .001
	Spelling skills	* 000	* .000

  *Significant difference

The comparison of performance between two languages

The performance of two languages has been analyzed using two statistical tests; percentage of mean scores, standard deviation. The maximum possible scores on alphabetic skills in Bengali were not same as English. To compare the total score obtained in both the languages percentage of mean scores were considered.

Percentage of mean scores:

On comparison the percentage of mean scores, letter name is the common skill in which both HA and LA scores poorer in Bengali than English. HA scores poor in vowel sound task in Bengali than English (table 4). LA scores poor in spelling task in Bengali than English (table 5).

Table 4: percentage of mean scores of HA in Bengali and English

Skills	Sub parameters	Bengali (Mean)	English (Mean)
		HA	HA
Phonics skills	Letter Name	99.809%	100%
	Consonant Sounds	95.684%	88.795%
	Vowel Sounds	67.718%	84.761%
	Reading and Decoding skills	30.380	29.904
	Spelling skills	8	7.904

Table 5: percentage of mean scores of LA in Bengali and English

Skills	Sub parameters	Bengali (Mean)	English (Mean)
		LA	LA
Phonics skills	Letter Name	94.380%	96.703%
	Consonant Sounds	91.666%	50.139%
	Vowel Sounds	66.130%	28.571%
	Reading and Decoding skills	21.714	12.476
	Spelling skills	3.095	4.333

Standard deviation:

The standard deviations are higher in all phonics skills in English for both HA (table 6) and LA (table 7) except letter name and reading and decoding skills of HA in Bengali.

Table 6: Standard deviation of HA in Bengali and English

Skills	Sub parameters	Bengali (± SD)	English (± SD)
		HA	HA
Phonics skills	Letter Name	± .601	± 0.1
	Consonant Sounds	± 1.555	± 1.769
	Vowel Sounds	± 3.341	± 6.015
	Reading and Decoding skills	± 1.961	± 0.538
	Spelling skills	± 0	± .30079

Table 7: Standard deviation of LA in Bengali and English

Skills	Sub parameters	Bengali (± SD)	English (± SD)
		LA	LA
Phonics skills	Letter Name	± 5.817	± 7.815
	Consonant Sounds	± 4.231	± 39.748
	Vowel Sounds	± 4.268	± 28.685
	Reading and Decoding skills	± 4.659	± 5.938
	Spelling skills	± 0	± 1.841

The maximum possible scores in alphabetic skills in English and Bengali were varied. Therefore, the comparison between two variables was not possible using chi-square test. The performances of HA and LA were compared separately in both the languages and these results were compared to obtain a view on differences between two languages.

Although no significant difference were found in some of the skills as mentioned above, poor achievers uniformly scored lower on all the test items, required more number of instructions, took longer duration to process the skills.

VI.   DISCUSSION

The investigation of the phonics skills to high and low academic achievements revealed a number of significant findings. The total scores on phonics differed significantly ($p<.05$) across both the groups. Poor achievers who fail to learn effectively have deficits in some key capabilities which include processing what they hear, retaining information, understanding and using language and making connections between ideas (Lacey, 2010). Lundberg & Hoien, (1999) identified characteristic indicator of phonological problems that play part in reading difficulties. These include; problem in segmenting words into phonemes, problem in keeping linguistic material (string of sound and letter) in short term memory, problem in repetition of non-word, slow naming of colors, numbers, letters and object in pictures, slow rate of speech, some times with indistinct

pronunciation, problems in playing word- games where the point is to manipulate phoneme.

Many researchers (Murphy, Pollatsek, & Well, 1988) have suggested a deficit in the phonological coding or deficit in lexeme level in children with Specific learning disabilities (Bock & Levelt, 1994; Indefrey & Levelt, 2000; Levelt, 1999; Levelt, Roelofs, & Meyer, 1999) which leads to difficulty in retrieving the phonological information. Ramus and Szenkovits (2008) reviewed a series of experiments aimed at understanding the nature of phonological deficits in developmental dyslexics. These experiments investigated the input and output phonological representations, foreign speech perception and production, unconscious speech processing and lexical access. The researchers found that the phonological representation of people with dyslexia may be intact and, the phonological deficits surfaces only as a function of certain task requirements, notably short term memory, conscious awareness and time constrains. Thus the researchers propose that individuals with dyslexia have a deficit to access the stored phonological information rather than a defective phonological system. Deficits in specific have been discussed below based on the statistical analysis.

The comparison of performance between HA and LA
Mean percentage scores and standard deviation

It is clear from the table no. 3 that the mean percentage scores of HA is higher in all skills than LA in both the languages. The higher SD value of low achievers in both the languages indicates that the scores of low achievers are more scattered and less uniform than high achievers. The uniformity across the scores signifies the intrinsic knowledge on that particular skill rather than learnt behavior. The higher mean percentage of high achievers indicate that they acquire the knowledge of metaphonological skills of particular language automatically during their language acquisition wherever, low academic achievers fail to acquire the knowledge of most of the skills during their language acquisition. This may lead to their scattered scores in various skills.

Chi-square test:
Alphabetic skills

Significant differences were found for most of the Bengali phonics skills like letter name, consonant sounds, reading and decoding skills and spelling skills, there was no significant difference in vowel sounds task. This may be in part owing to the ease of production and distinct pronunciation of vowels which have fixed number of pronunciations. Relatively complex bilateral hemispheric activation for alphasyllabic script (Kumar et al., 2009) may lead to the overall poor performance of low achievers in Bengali phonics skills. Along with the visual complexity, more numbers of varnas in Bengali script may also contribute to the significant difference in letter naming task. Poor reading and decoding skills may ascribe to the relatively complex articulatory movements for the production of consonant sounds which are more in number compared to vowel sounds. The generalization rule is more consistent for vowels rather than consonants (Ehri, 1983). The generalization rule is, if the name contains a vowel, that vowel is the value of the letter. This may be the reason for no significant difference in vowel sound task compared to consonant sound task. The letters represent vowels

are relatively visually less complex. Vowels are focused or learnt first. Therefore, vowels can be read by using route memory. It may also contribute to the no significant between the performance between low and high academic achievers.

The significant differences were found for all the English phonics skills except for letter name. The less complex visuo-spatial processing and less number of letters may contribute to no significant difference in letter naming task. Inconsistent generalization rule for both vowel and consonant sounds contribute to significant difference to both consonant sounds and vowel sound task. Further unlike Bengali varnas the English alphabets can be sung in a rhythm that children enjoy repeating and reciting (Patel, 2004). Regular repetition of the alphabetic strings may have lead to better retention and retrieval of the alphabets.

Reading and decoding

The task used to assess reading and decoding required the participant to read both real and pseudo-words. To read effectively, children must learn to decode printed words to access their meaning (Adams, 1990). The decoding process involves matching a printed word with an underlying phonological representation in order to access to the word's meaning or semantic representation (Ehri, 1983). It has been proposed that the cognitive processes engaged when reading a word overlap considerably with those engaged when naming a known object. In the both instances one perceived and identify a visual stimuli and retrieve its associated lexical form, which is then output during articulation. It is also well established that picture naming which is related to word reading provides a means to index literacy skill. Picture Naming performance in kindergarten; for example, represents a powerful predictor of later reading ability (Wolf and Goodglass, 1986). During reading, a stored phonological code is retrieved which is likely to consist of phonological segments that are activated and assembled into a sequence that controls production, however despite a large amount of empirical research, it is still a matter of debate how these connections are instantiated (Coltheart, 1978).   Hanly and Champman (2008) , used Tip of the tongue responses on a picture naming task and found that dyslexia involves phonological, but not semantic processing deficits.

The dual route cascade model by Coltheart, Rastke, Perry, Langdon and Zeigler (2001) explains reading and spelling the model specifies that the meaning of printed words can be accessed via two separate but interactive routes, phonological route or non lexical route and visual route or lexical route. When the child reads a word by producing one-sound-at-a-time (s) he uses the phonological route (Gillon, 2004). The phonological processing route is not necessarily the only route to word recognition. Proponents of the visual route argue that many irregularities in pronouncing English word require readers to bypass phonological route and map orthographic representations directly onto semantic representations through the lexical route (Coltheart, 1978; Karanth, 2003a). Keeping in view the orthographic nature of English and Bengali it can be assumed that English may predominantly be processed through the lexical route while Bengali can be easily processed through the non-lexical route.

An alphabetic system such as English script represents language at the level of phonemes. This offers a linear writing system has one of the most opaque orthography (Eng, 2002; Goswami, 2002). Indian systems of writing, that have a common source of origin in Brahmi, are non linear, alphasyllabic (Bright, 2000, Karanth, 2003a) and have a transparent orthography (Karanth, 2003a). Because of the phonetic nature the ancient script since the 3rd century BC is remarkably modern (Patel, 2004).

Non-word reading test is very good measure of phonological processing (Snowling, 1996) and the Dual – Route models explain the mechanism of reading nonword (Coltheart, 1978). Proficient reader can read pseudo word, nonword, nonsense word, even though they are totally novel, because they can sound out the letters one by one. Gathercole and Baddeley (1990, 1993 and 1996) suggested that the relationship between nonword repetition and lexical knowledge can be explained in two different ways. The first explanation is called the linguistic hypothesis: children with high lexical knowledge are able to repeat more non-words than children with low or limited lexical knowledge. They assumed that children with high lexical knowledge can benefit from the presence of familiar phonological segments (assimilated to some morphemes of their first language) in the non-words in order to facilitate repetition. The second explanation is called the mnesic hypothesis: subjects use the short-term memory representations of non-words (or of the non-familiar phonological forms) to build permanent lexical representations of the phonological forms.

The model proposed by Geschtwind and Wolf, 1991 can be accounted in the explanation of reading and decoding skills. The model explains that meaning of words are extracted or retrieved after receiving the stimuli through visual mode. In the next step phonological codes are assembled before words are stored at lexicon. Then the articulatory movements are sequenced in order to produce a word. Difficulty in assembling phonological codes and complex articulatory sequencing may attribute to the significant difference in reading and decoding task in both the languages. The difficulty in extracting meaning of complex words, not frequently used in conversation may also account for the same. Considering the articulatory feedback (Vihman, 2012) relexification route involved in speech development, however, isolated articulation impairment may well affect the development of underlying phonological representations. This is consistent with clinical evidence of many children presenting with a combination of both articulation and phonological impairments (Dodd, 1995).

Spelling skills were assessed by asking the participant to identify the first and the last sound of the pronounced word. The participant requires acquiring fine grained capabilities to identify the phonetic details of features occurring at the word initial and final positions. Low academic achievers performed significantly poor on the task. The skill to identify phonetic features can be developed as early as eight months of age.

Comparison between two languages
Mean percentage scores:

On comparing the percentage of mean scores, both the group HA and LA score higher in all phonetic skills except letter name, vowel sounds and spelling skills. Letter name is the common

skill in which both HA and LA scores poorer in Bengali than English. Relatively complex bilateral hemispheric activation for alphasyllabic script (Kumar et al., 2009) contributes for the same. Visual complexity, more numbers of varnas in Bengali script may make the task complex.

HA scores poor in vowel sound task in Bengali than Vowel sounds. The variations in sounding for vowels are more in numbers in English compared to Bengali. This phenomenon may lead to the make the task to produce a single vowel sound in English than Bengali. A part from that there are only two vowels in Bengali which varies in sounding. Due to less number of vowels which varied in sounding the frequency to use vowel variation in language is less. Participants may not be aware of vowel variation in that language.

LA scores poor in spelling task in Bengali than English. When the LA were asked to write down the first sound or last sound in Bengali and English words, it was expected to write down the first consonant with following vowel or the last consonant with preceding vowel. As in English the vowels are independent in form the participants may not face any difficulty to mention the vowel along with consonant whereas due to dependent form of Bengali vowels they may face problem to mention out the vowel.

Standard deviation:

Letter name and reading and decoding skills are such skills in which the standard deviations are more for HA in Bengali than English. Relatively complex bilateral hemispheric activation for alphasyllabic script (Kumar et al., 2009) contributes for the more scattered scores of HA in letter naming and reading and decoding task. Visual complexity, more numbers of varnas in Bengali script may make the task complex. Expectedly standard deviations are higher for LA in all the phonics skills in English than Bengali. The fact that Bengali is the mother tongue may be giving an advantage to the students.

Chi-square:

The significant differences were found in Bengali letter naming task whereas no significant differences were there in English letter naming task. This phenomenon can be explained through Dual route cascade model, Bengali is phonologically transparent, nearly always regular, and can therefore be treated sub-lexically. Use of the lexical route, although not prohibited, may not occur given that Bengali words even the complex ones are phonologically transparent and there are very few irregular words. English, on the other hand, is a very irregular 'alphabetic writing system' and the lexical route is consistently very often required for both reading and writing. Complex visuo-spatial processing for syllabic script may contribute to the fact. There was significant difference in consonant sound task in both the languages. High achievers are expected to learn with greater efficiency as compared to the low achievers who in spite of exposure may not be in a position to internalize the language and its rules. At least 90% of schools going children learn the letter-sound correspondences without exceptional effort within a few months (Blomert, 2002). In vowel sound task, although significant difference was found in English but no significant difference was found in Bengali. It can be explained by the consistent generalization rule for consonant sounds compared to

vowel sounds (Ehri, 1983). Inconsistent generalization rule for vowel sound in English script compared to Bengali script may describe the phenomenon of no significant difference in Bengali vowel sound task and significant difference in English vowel sound task. Apart from that, Bengali being the native language provides ample opportunity for it to be learned and to be taught both by teachers and by parents. Majority of the children were exposed to English as their second language and most of them came from non-English background. This might be a reason for the significant difference in performance of the HA and LA in vowel sound task in English than Bengali. It was observed during assessment that the writing script influenced lot in reading and spelling performance. When the participants were asked to write non-word like 'pʰern' in Bengali, most of the participants did the mistakes to pronounce /r/ before the vowel in place of following the vowel. This type of mistakes are due to the dependent form of vowel in Bengali script whereas, this mistakes were not noticed in English script due to its independent form of vowel in writing script.

The poor performance of both high and low achievers in almost all English phonics skills compared to Bengali phonics skills can be explained through Dual route cascade model cited by Steven et al., 2007 in his study. Bengali is phonologically transparent, nearly always regular, and can therefore be treated sub-lexically. Use of the lexical route, although not prohibited, may not occur given that Bengali words even the complex ones are phonologically transparent and there are very few irregular words. English, on the other hand, is a very irregular 'alphabetic writing system' and the lexical route is consistently very often required for both reading and writing.

Karanth (2002) in on study on bilingual dyslexic speaking Hindi and English found subtle differences. Hindi is phonologically transparent, nearly always regular, and can therefore be treated sub-lexically (ref dual route model). Use of the lexical route, although not prohibited, may not occur given that Hindi words even the complex ones are phonologically transparent and there are very few irregular words. English, on the other hand, is a very irregular and the lexical route is consistently very often required for both reading and spelling. Another supportive study by Gupta and Jamal, 2006 examined the nature of reading errors made by dyslexic readers in Hindi and English. A significant correlation was found between reading accuracy in Hindi and in English as well as the difference in the type of errors in both the language indicated different processing demands placed by the two languages on the readers.

In a multilingual country like India the cognitive load on the school children increases substantially since they have to cope with at least two languages. The first is the native language and English, a second language which has one of the most opaque orthographies in the world (Eng, 2002; Goswami, 2002). Consequently, explicit instruction in the alphabetic code, is needed for many if English reading acquisition is to be successful (Swank & Lariveé, 1998; Hiebert & Taylor, 2000) for the multilingual populations (Smythe & Everatt, 2002).

VII. CONCLUSION

The difference in scholastic performance between low achievers and high achievers in part may be attributed to inadequate metaphonological knowledge of the low achievers. Consequently, this issue should be carefully considered during classroom teaching. In academic syllabus, phonics tasks at the syllabic level should be provided importance and during classroom curriculum for teaching reading /spelling in Indian languages. The speech language pathologist should also build up skills in this area and provide assistance to children who are poor language learners but do not present any overt symptoms of delay or deviance of linguistic skills.

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