

## COMPARISON OF NON-WORD REPETITION SKILLS IN BILINGUAL (KANNADA-ENGLISH) DYSLEXICS

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### Introduction

Phonological, or verbal, short-term memory is the ability to code information phonologically for temporary storage, and is measured with various tasks including digit span, sentence span, word-list memory, and repetition of nonwords (Cornwall, 1992). Non word repetition, phonological memory task and phonological analysis appear closely linked in young children. Nonword repetition is often reported to be deficient in children who struggle learning to read in alphabetic orthographies (Cornwall, 1992). For instance, difficulties in nonword repetition in grade school children have been associated with word recognition problems (Gathercole & Baddeley, 1990; Gathercole, 1995) and overall reading achievement (Stone & Brady, 1995).

Immediate verbal memory has been seen a hallmark of dyslexia. The psychometric hallmark, correspondingly, has been a low score on digit span or recall of digits. Results on these two tests, however, though reliable, are also somewhat enigmatic. Stimuli for immediate verbal repetition may be familiar or unfamiliar (contrived words). The requirement to repeat actual words is susceptible to the influence of prior vocabulary and hence cultural difference. Long-term lexical knowledge has been shown to influence performance on such short term tasks. At younger ages a non-word repetition task may be more reliable and yield individual differences that are more stable than digit repetition (Gathercole et al., 1994). More over the vocabulary influence is lower, and the memory component higher, when unword like non-words are used. One view is that internal phonological representations are built up from infancy and operate in normal individuals as a well-constructed processing system (Mehler, 1994). Individuals with impaired or non intact speech sound processing have complex difficulties in remembering utterances as well as learning the mappings between sound and print. Another view is that a dedicated auditory verbal memory system, the phonological loop, acts as a buffer with degrees of sensitivity and capacity.

Non word repetition is a major asset in assessing the phonological processing of children as young as four years. However, the ability to repeat five syllable nonwords plateaus at about 9-10 years and other phonological manipulation tasks are needed for the older or more able child or adult. Psychologists used to familiar psychometric instruments may over estimate attentional, 'working memory' aspects and under estimate linguistic aspects of this diagnostic activity. Non word repetition is highly associated with both current and later reading development to a greater extent than digit span.

Gathercole & Baddeley (1990) showed that SLI children had more difficulties remembering lists of numbers, and repeating non-words such as 'doppelate'. In particular, SLI children show difficulties with repeating non-words that are longer (4 or 5 syllables) as well as with non-words that are more complicated as they have more consonant clusters (such as perplisteronk). However, phonological short-term memory is also known to overlap with established language knowledge. For example, some non-words (those that resemble real words more closely) are repeated more accurately by young children. So, non-words that do not resemble real words may comprise a purer measure of phonological short-term memory (Gathercole, 1995).

Researchers have argued that learning mechanisms exist that derive patterns of sound combination, or phonotactic knowledge. Such a perceptual learning mechanism may facilitate the encoding and production of words from incoming speech. Furthermore, phonotactic knowledge may help children and adults to preserve and produce nonwords in short-term memory. Researchers have found that nonwords with more common sound patterns are better remembered by children compared to nonwords with less common sound patterns (Gathercole, Frankish, Pickering & Peaker, 1999). However, words are still remembered better than nonwords by children, even when they contain sound patterns that occur just as often, suggesting independent contributions of lexical and phonotactic knowledge to short-term memory tasks (Gathercole et al., 1999).

SLI children have been argued to have difficulties with encoding and segmentation that may underpin phonological difficulties, particularly with nonword repetition (Bishop et al., 1999). Therefore, it was predicted that young people with SLI would be less accurate and slower at making correct comparisons between nonword pairs, compared to other young people of a similar age and/or language level. If encoding difficulties overlap with auditory perceptual processing skills of SLI children, no differences between SLI children and chronological age controls would be predicted on accuracy and speed measures on the shapes comparison task. Similarly, if nonword judgment and nonword repetition tasks are largely dependent on segmentation of auditory percepts, then a significant relationship between nonword repetition and nonword judgment tasks would also be expected.

Nonword reading as we have seen is a particularly effective probe of phonological reading skill. Tests like Woodcock Reading Mastery Tests – Revised, (Woodcock, 1987), nonword decoding test, (Turner, 1994)

and The Children's Test of Nonword Repetition (Gathercole, 1994) are being used for assessing nonword repetition skills in western context. In Indian context, there are no tests. A few are exceptions like subtask of non-words in Reading Acquisition Profile-Kannada (Prema, 1997).

**Need for the study**

There is no study available regarding the nonword repetition skills in any of the Indian languages with respect to learning disability. And this task is very important in finding the phonological memory ability of the dyslexic children.

**Aim of the Study:** To compare the differences between non-words repetitions in bilingual (Kannada - English) dyslexics.

**Methodology****Subjects:**

10 learning disabled children aged between 8 to 15 years with Kannada as their native language and studying in English medium were considered for this study. All 10 children were diagnosed as learning disabled by using Early Reading Scales (ERS, Rae and Potter, 1981) earlier.

**Test material:**

10 Kannada tri syllabic non words which were selected from Reading Acquisition Profile in Kannada (RAP-K by Prema., 1997), 10 Kannada bi-syllabic words which were selected from analyzing acquired disorders of reading in Kannada by Coltheart and Karanth (1984) and 10 English non-words were selected from Analyzing Acquired Reading Disorders of Reading by Coltheart (1981).

**Data Collection:**

Data collection was done at Department of Speech – Language Pathology, All India Institute of Speech and Hearing, Mysore.

**Procedure:**

All the non- words were presented orally to the subjects and were asked to repeat the non- words. And the responses were tape recorded for detailed analysis.

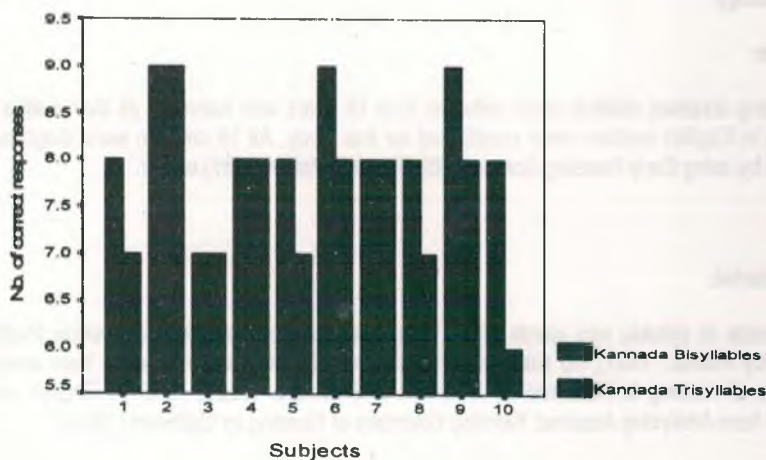
**Results and discussion**

The results show that learning disabled children have more difficulty in repeating Kannada trisyllabic words than Kannada bisyllabic non-words. When the results were compared between English and Kannada, dyslexics had more difficulty in repeating the English mono syllabic non-words than Kannada bi and tri syllabic words. This can be because of the structural or graphical changes of the languages. This study reveals that dyslexics have more problems in English even for the monosyllabic words.

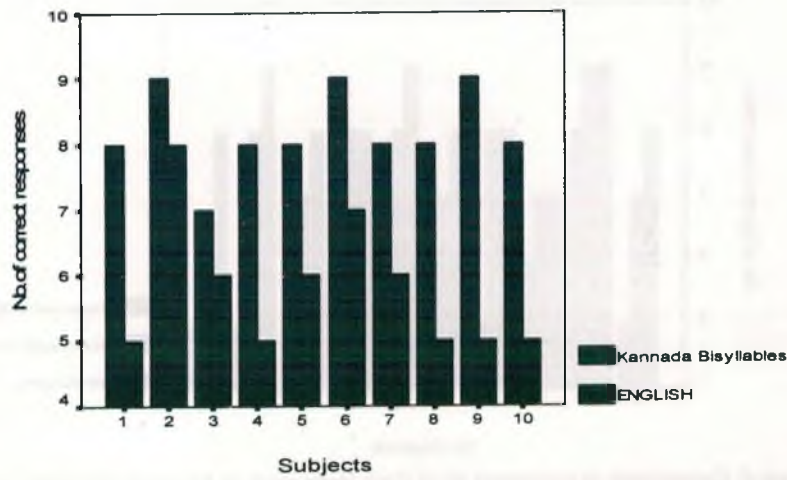
#### Repeated measures ANOVA:

All the data was analyzed on repeated measures of ANOVA (Post Hoc test). The results suggest that there is no significant difference between the repetition of Kannada bisyllabic non-words and Kannada trisyllabic non-words ( $r = 0.178, > 0.05$ ). But there was significant difference between the repetitions of Kannada bisyllabic non-words and English monosyllabic non-words ( $r = 0.01, < 0.05$ ) and also there is a significant difference between repetition of Kannada trisyllabic non-words and English monosyllabic non-word repetition tasks.

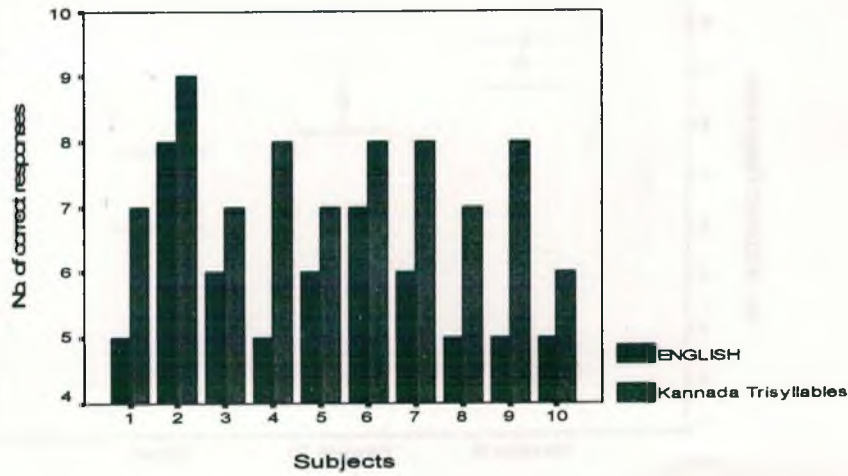
The graphical representation of the results is shown below:



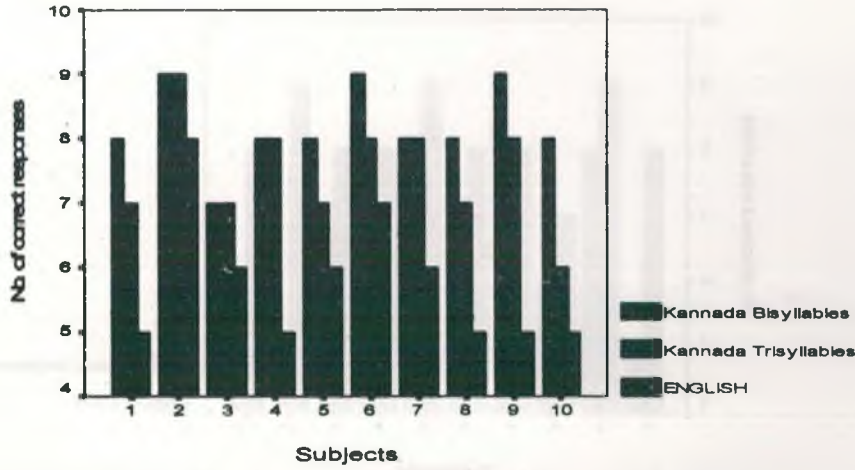
**Graph-1: Comparison of responses of Kannada bisyllabic non-words and Kannada trisyllabic non-words:**



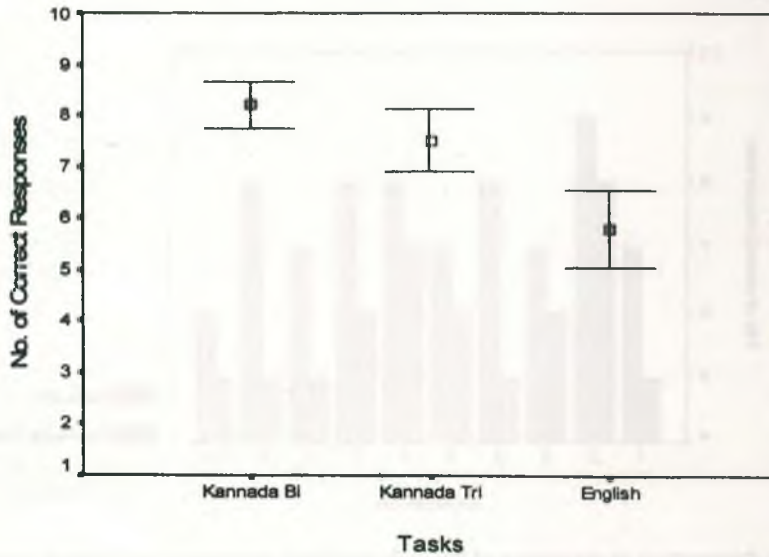
**Graph-2: Comparison of responses of Kannada bisyllabic non-words and English monosyllabic non-words:**



**Graph-3: Comparison of responses of Kannada trisyllabic non-words and English non-words.**



**Graph-4: Comparison of responses of all three tasks such as Kannada bisyllabic, Kannada trisyllabic and English monosyllabic non-words:**



**Graph-5: Comparison of Mean and standard deviations of all the tasks.**

The above results show that there is a large difference between repetition of non-words in Kannada and English. In Kannada, when the length of the non-word increases, reduced response was observed in

many subjects. All the subjects could do well in repetition of Kannada bisyllabic task but there were reduced responses for repetition of Kannada trisyllabic non-words. When the results of repetitions of Kannada (both bisyllabic and trisyllabic) and English were compared, poor responses were observed in English tasks even though the test items were monosyllabic.

### Conclusions

This study revealed that the dyslexics have mild difficulty in repeating non-words in native language i.e., Kannada and more difficulty in English which is their medium of instruction at school. Thus these deficits indicate that there are problems in phonological memory and phonological awareness. These are both affected in native language and also in the language which is the medium of instruction at school. Thus there is a need to include this "non-word repetition task" in test battery when we assess children with learning disability and should address these errors in treatment sessions.

### Acknowledgement

We would like to thank *Dr. Vijayalakshmi Basavara*, Director, All India Institute of Speech and Hearing, Mysore, for permitting us to conduct this study.

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