

READING ACQUISITION IN MALAYALAM-ENGLISH BILITERATES

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Background

- *Biliteracy* is children's competency in two written languages developed to varying degrees either simultaneously or successively (Dworin, 2003).

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- Investigations of biliterate children learning to master reading in two orthographies are meager.
 - Within the same orthographic systems (e.g., alphabetic), differences in reading acquisition have been reported between deep (English) and shallow (Welsh) orthographies (Spencer & Hanley, 2004).
 - Available cross-orthographic investigations (e.g., Chinese-English) of reading acquisition (Wang, Perfetti, & Liu, 2005) have shown that the orthographic skills could differ radically despite the comparable phonological skills in both orthographies.

Indian context

- Bi/multilingual
- Education policy follows '*3 language formula*' - wherein first language is the mother tongue/ regional standard language taught in primary school; and the second and third languages are national language (Hindi) and English introduced in secondary school.
- Yet no empirical research addresses biliteracy issue

- Indian languages follow alphasyllabic writing, which in turn is quite distinct from alphabetic writing system



- Places young children learning to read and write these distinct languages in a cognitively demanding position (Wang et al., 2005)

Aim of the Study



- To investigate reading acquisition in Malayalam-English bilingual children learning to read and write in two distinct writing systems (alphasyllabic and alphabetic) simultaneously

Objective




To investigate development of phonological awareness skills, reading and orthographic knowledge in Malayalam-English biliterate children across Grades I to VII.

Method

- **Participants:**
- 210 children (30 each) from Grades I to VII from two English medium schools of Calicut district in Kerala

Grade	Mean Age (in years)	Males	Females
I	7	14	16
II	8	14	16
III	9	14	16
IV	10	14	16
V	11	15	15
VI	12	16	14
VII	13	12	18

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- Medium of instruction – English
 - No history of:
 - developmental delays
 - reading or writing difficulties (as confirmed by teachers)
 - Any neurological diseases (e.g., epilepsy)

Tasks used..

- **Phonological Awareness:**
 - *rhyme recognition*
 - *syllable deletion*
 - *phoneme deletion*
 - *phoneme oddity* in Malayalam (adapted from Seetha, 2002; Ponnumani, 2003 with modifications) and in English

Tasks used..

- **Reading words and nonwords:**
 - words pooled from grade textbooks followed by familiarity rating by class teachers
 - nonwords prepared by transposing vowels and consonants in true words
- **Orthographic knowledge:**
 - recognition and recall of orthographic units in Malayalam (akshara) and English (letter) of varying complexity

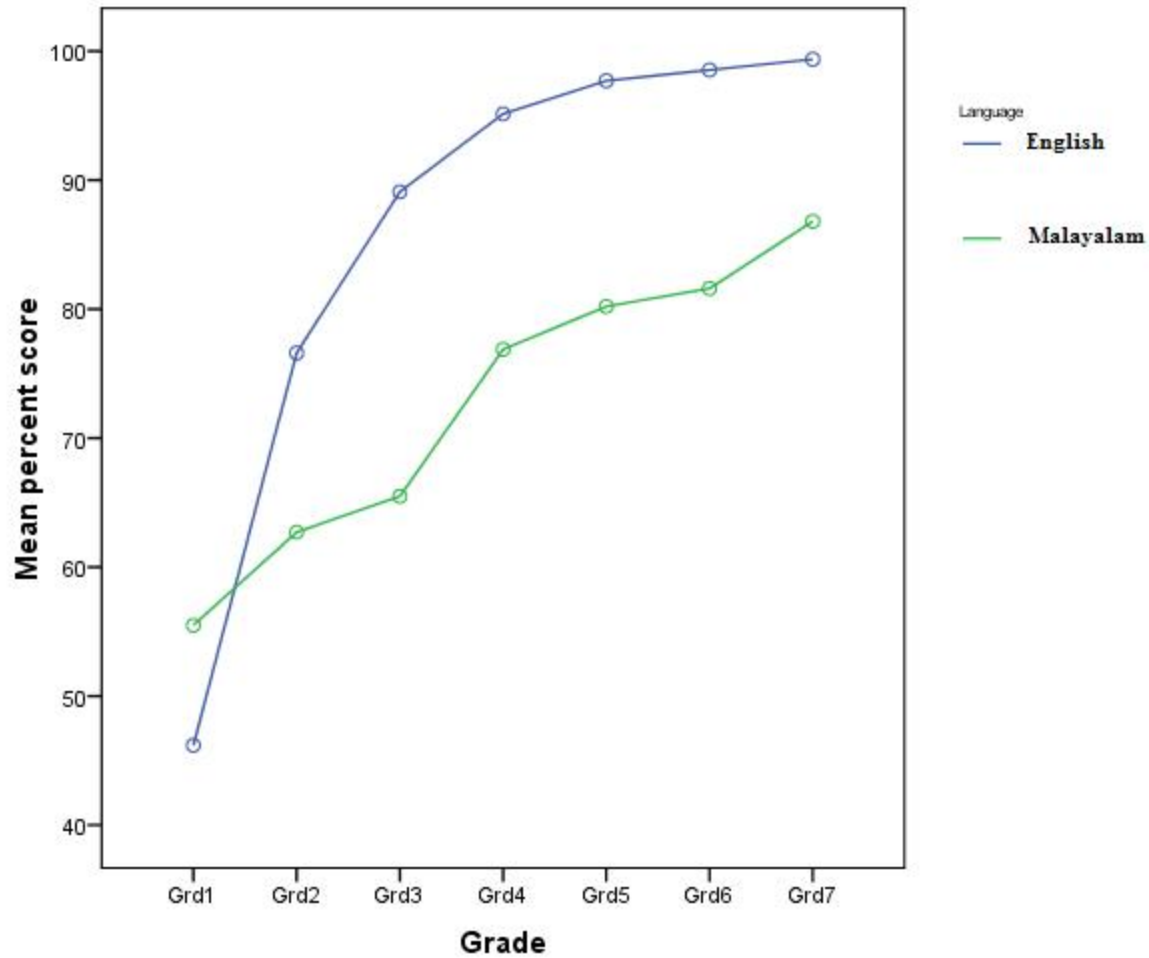
Findings of the Study

- A developmental trend observed for literacy skills (phonological awareness, reading of words and nonwords and orthographic knowledge) in both languages.
- Significant main effects of grade and language was obtained for all tasks
- A significant interaction of grade and language was also obtained for all tasks

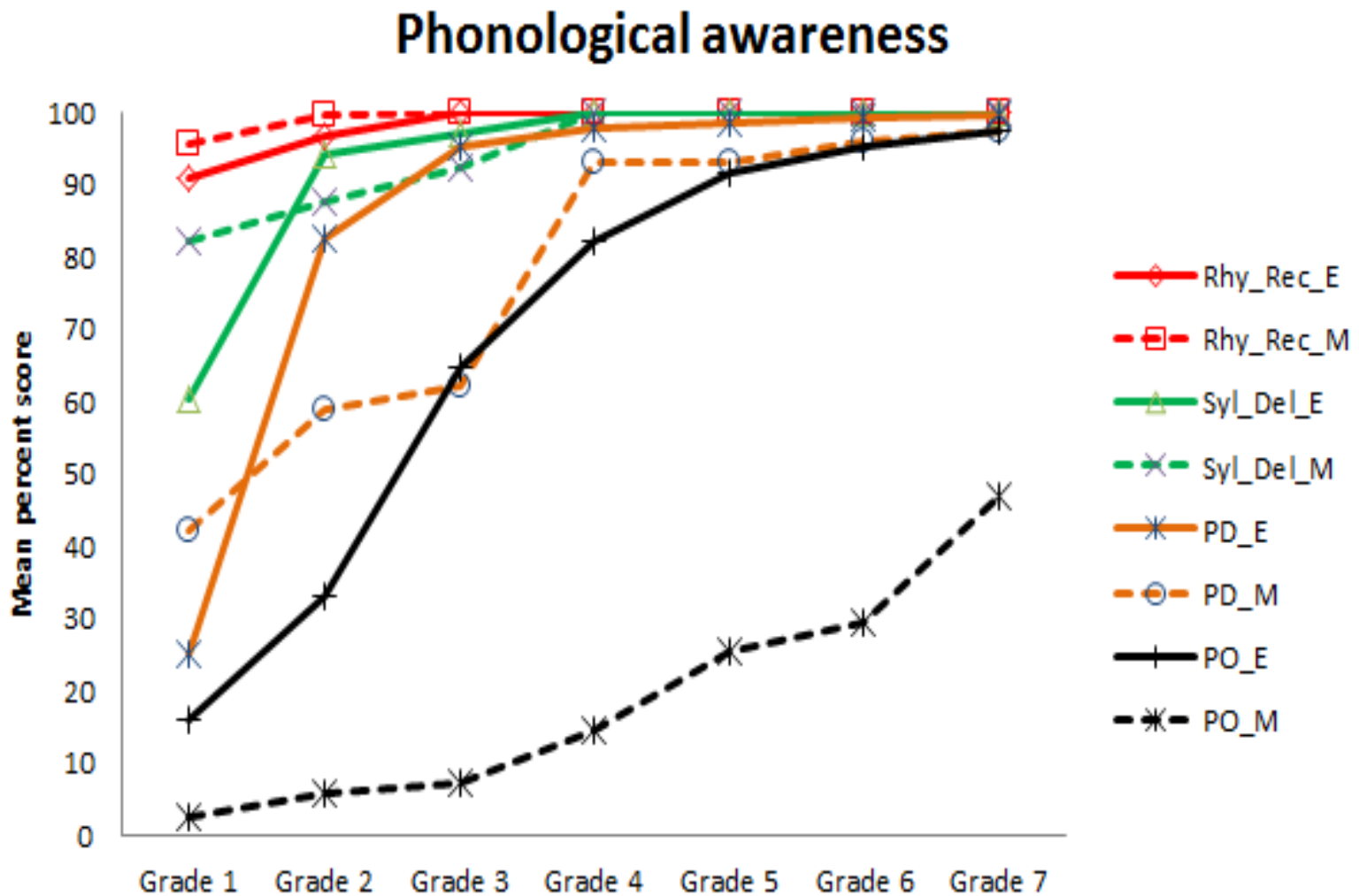
Phonological Awareness


- The composite scores on phonological awareness tasks showed apparent difference between the two languages
- Malayalam showed gradual development
- By 4th Grade and above children obtained more than 90% score

Phonological Awareness

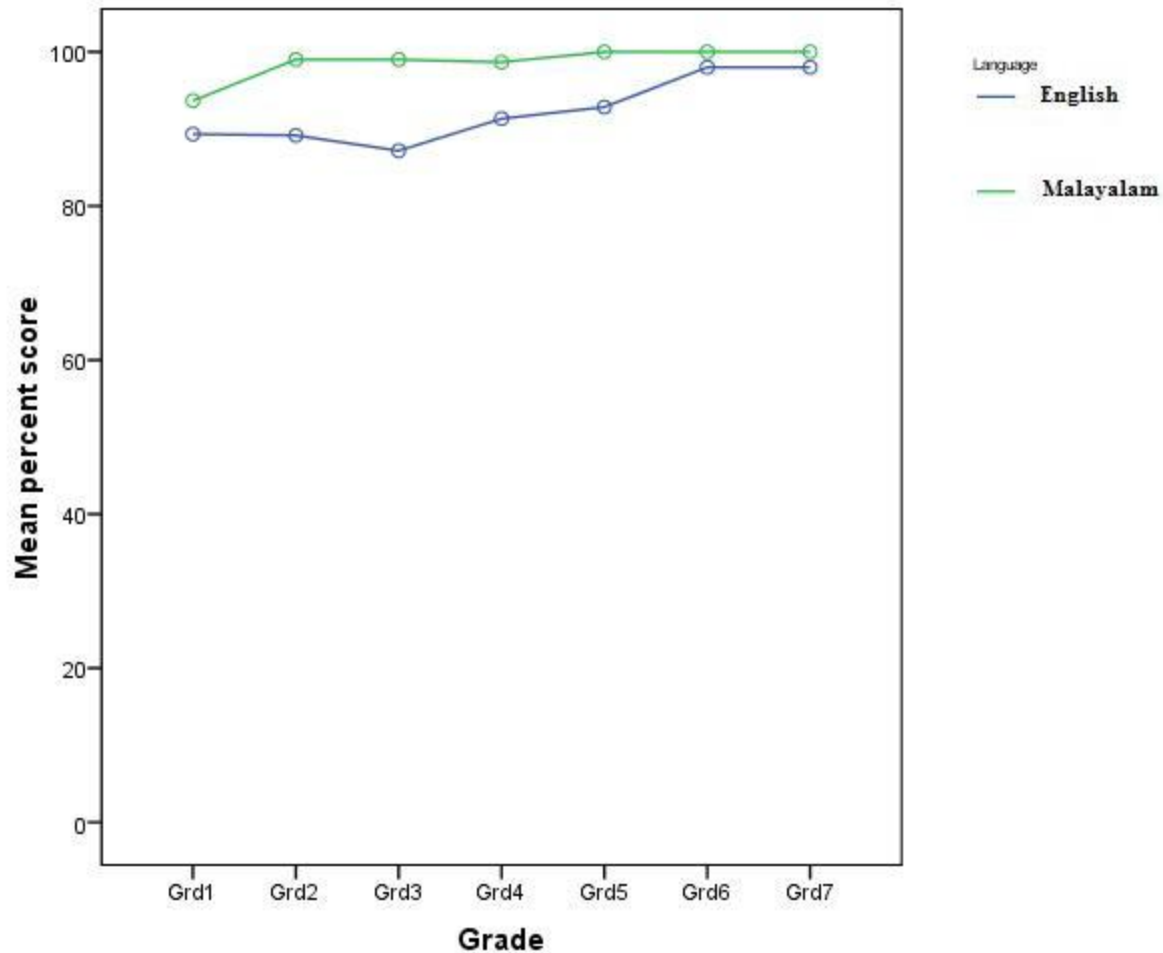


Subtests of phonological awareness task



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- Rhyme recognition task as a function of language (i.e., English & Malayalam) showed significant effect up to 2nd Grade
 - Syllable deletion task as function of language showed significant effect up to 3rd Grade
 - Phoneme deletion task as a function of language showed significant effect up to 3rd grade. Surprisingly, children at 7th grade also exhibited a significant effect
 - Phoneme oddity showed significant effect across the grades from I – VII as a function of language/ writing system.

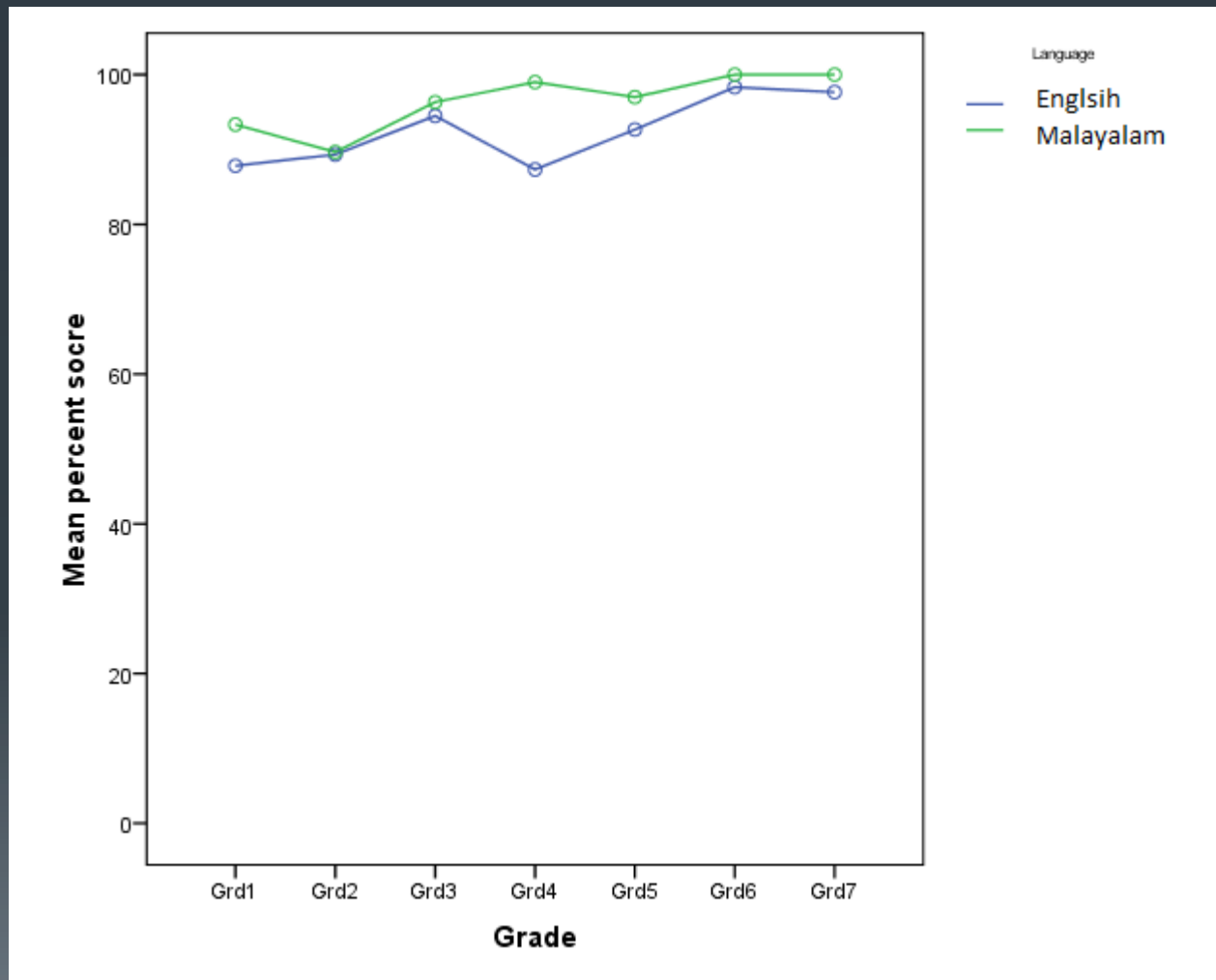
True word reading



True Word Reading

- Reading (true) words in Malayalam (M = 92.62; SD = 6.95) was significantly better compared to English (M = 92.26; SD = 6.95) ($F(1, 203) = 85.01; p < 0.001$).
- An interaction found between Grade and Language of reading ($F(6, 203) = 4.3; p < 0.001$) ($p < 0.001$).
- Post-hoc analysis revealed that word reading scores of Grade I significantly differed from V – VII, and Grades II and III differed from Grades VI and VII

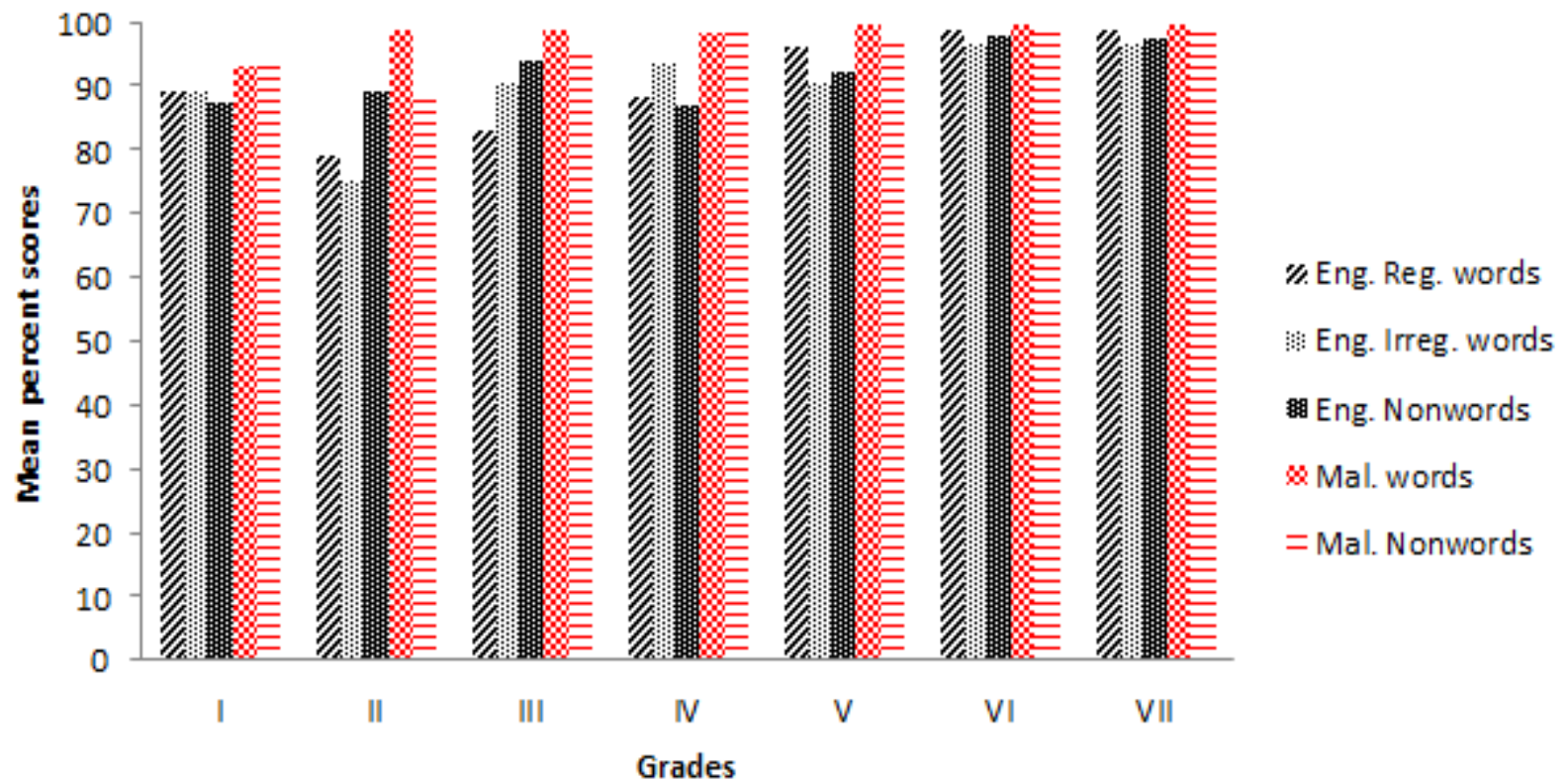
Non-word reading



Non-word reading

- Reading non-words in Malayalam ($M = 96.48$; $SD = 6.91$) was significantly better compared to English ($M = 92.52$; $SD = 7.4$) ($F(1, 203) = 51.25$; $p < 0.001$).
- An interaction found between Grade and Language of reading ($F(6, 203) = 6.83$; $p < 0.001$).
- Post-hoc analysis revealed that non-word reading scores, in general, showed a scattered distribution.

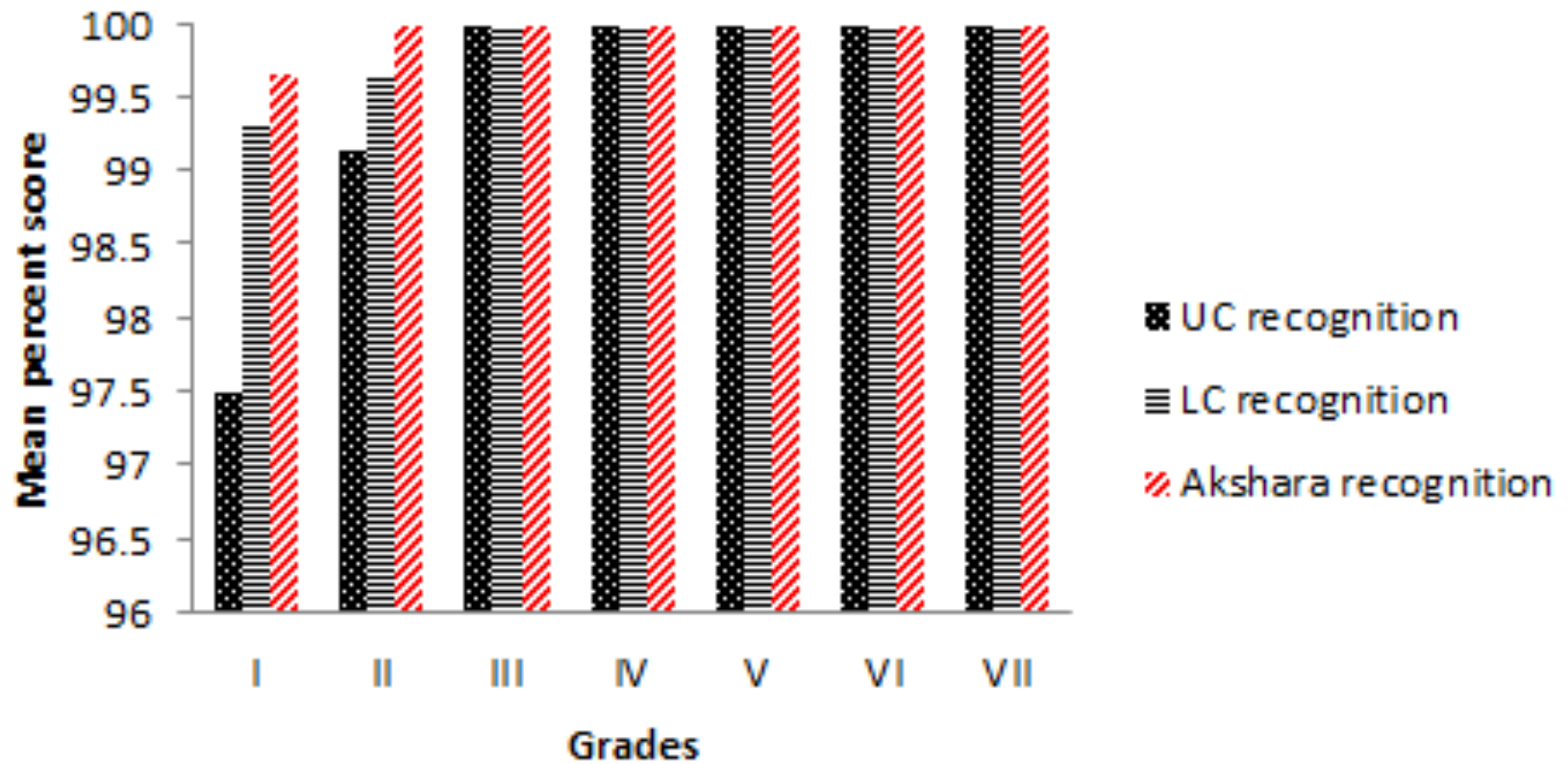
Reading tasks



Orthographic Knowledge

- Orthographic recognition preceded recall skills in both languages
- Development of orthographic recall skills varied with complexity of the letter/akshara

Orthographic recognition



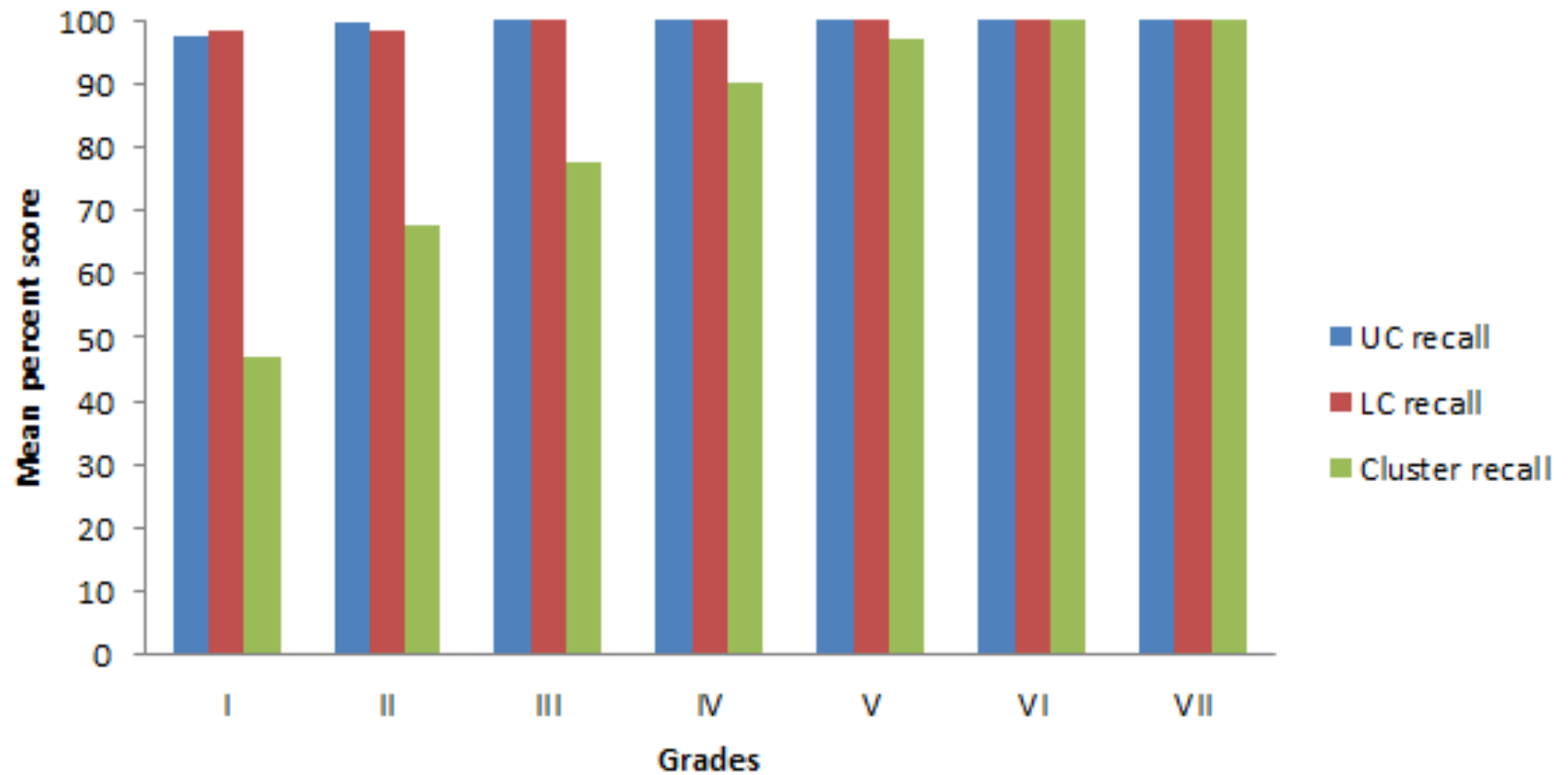
Orthographic recognition

- The marginal difference in letter recognition scores in English (M = 99.70; SD = 1.4) with the akshara recognition scores in Malayalam (M = 99.95; SD = 0.69) was significant (F (1, 203) = 9.51; $p < 0.05$).
- An interaction found between Grade and Language of reading was significant (F (6, 203) = 4.58; $p < 0.001$).
- Post-hoc analysis revealed that the scores of orthographic recognition in Grade I differed from all other grades except Grade II.

Orthographic recall

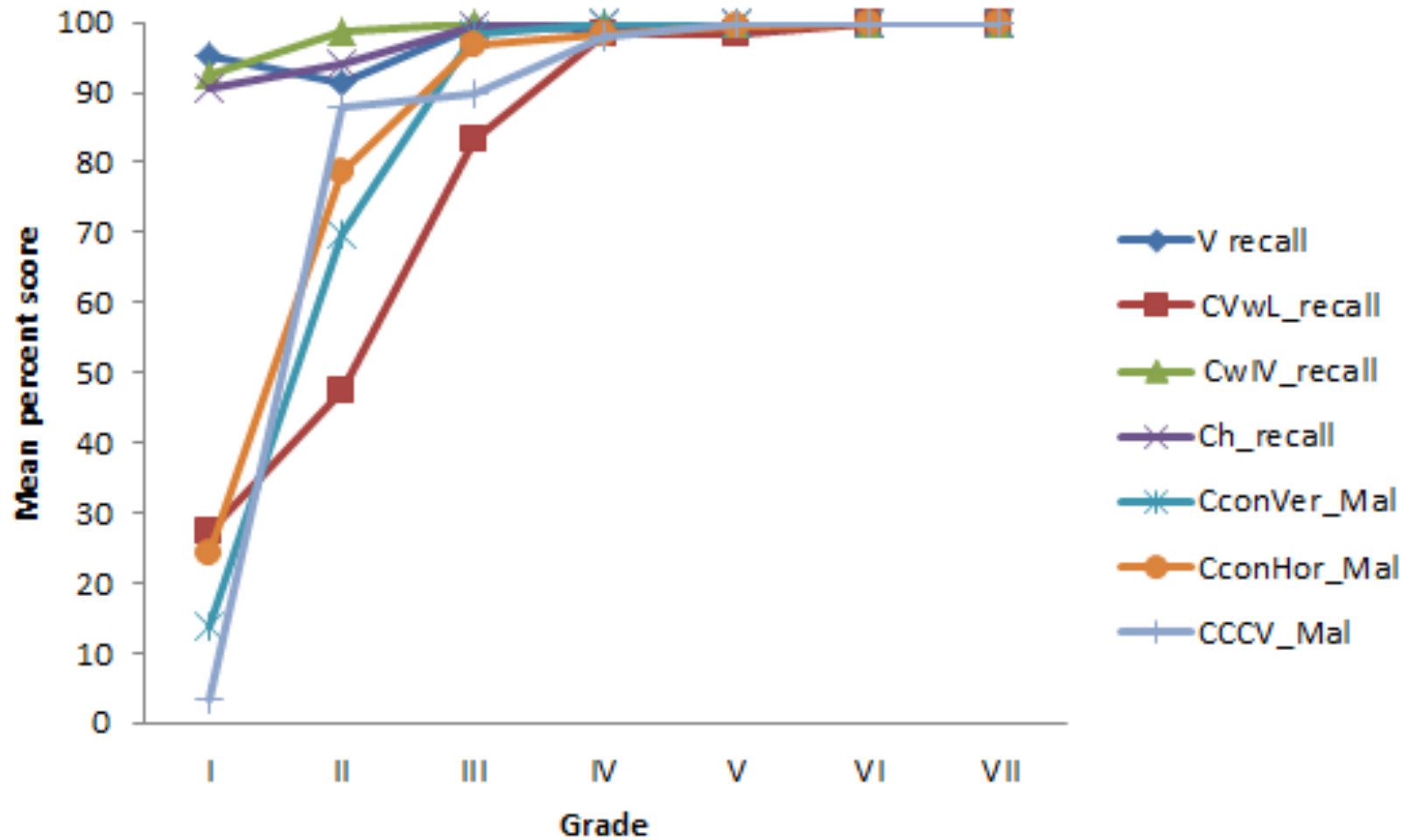
- Orthographic recall in Malayalam ($M = 90.58$; $SD = 16.36$) was significantly poorer compared to English ($M = 93.94$; $SD = 7.00$) ($F(1, 203) = 181.3$; $p < 0.001$).
- An interaction found between Grade and Language ($F(6, 203) = 273.83$; $p < 0.001$).
- Post-hoc analysis revealed that the orthographic recall did not differ from Grade V and above.

Letter recall (English)



Akshara type	Example
Vowel in primary form (V)	അ [a/]
Chillaksharam (akshara without inherent vowel) (C-IV)	ഈ [eɪ/]
Akshara with inherent vowel (CwIV)	ക [kʌ/]
Akshara with ligature (CVwL)	കി [ki/]
2 consonant cluster (2Cclus)	കവ [kvʌ/]
3 consonant cluster (3Cclus)	ക്രക [skrʌ/]
Consonant conjunct - vertical	ണ്ണ [ɳɳʌ/]
Consonant conjunct - horizontal	ക്ത [ktʌ/]

Akshara recall - Malayalam





Discussion

- The results showed that the literacy skills matured as a function of grade in both languages, though at a different pace.
- Phonological awareness is considered essential for reading development and it requires the ability to detect, isolate, or manipulate sub-word phonological segments.
- It develops as a function of age (Bowey & Francis, 1991) and interacts with print (Bentin, Hammer & Cahan, 1991)

Phonological awareness

- The rhyme recognition task showed mastery (~100%) only by Grade III in the current study. However, in English-speaking children, this skill is reported to be mastered early by 3-4 years of age (i.e., preschool period) (Chukovsky, 1963; Maclean, Bryant, & Bradley, 1987).
- The reasons for this disparate findings may be:
 - The nature of literacy training
 - Children trained on musical activities to improve phonological skills perform better in rhyme recognition task (Escalda et al., 2011).
 - In this context, poor performance on rhyme recognition in both English and Malayalam is indicative of the nature of pre-literacy training provided in our educational set up.

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- The performance on phoneme tasks (i.e., phoneme oddity & phoneme deletion) compared to syllable tasks (i.e., syllable deletion) supported the previous arguments that syllable awareness skills are easier and acquired earlier than phoneme awareness skills in young children (Fox & Routh, 1975).
 - However, in Malayalam, the results showed a significant difference across the grades compared to English. The reason for this disparity may be the use of non-words in the former language and the use of true words in English.

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- In general, the results showed a gradual development of phonological awareness skills in Malayalam. This observation supports the findings of Nag (2007) who claimed that the influence of the orthographic domain leads to a later development of phonemic skills in the alphasyllabaries (e.g., Kannada).

Reading

- A minimal developmental pattern may be noted from the scores of this study.
- Both word and non-words were read more accurately in Malayalam than in English.
- The better performance in Malayalam may be explained on the grounds of *Orthographic Depth Hypothesis* (ODH) that explains the differences in cognitive demands when reading in different languages (Frost, 2005).
- Cross-linguistic data from alphabetic writing system reveal that learning to read in opaque orthographies (having inconsistent sound/letter mappings) take longer than in transparent orthographies (Seymour, Aro & Erskine, 2003).
- Malayalam orthography is comparatively transparent to English having consistent grapheme to phoneme mapping – thus explains better performance on reading task.

Orthographic knowledge

Orthographic recognition

- The results of this study showed that children learning to read Malayalam obtained 100% scores by Grade II on orthographic recognition, whereas the same children in English attained full score by Grade III.
- This may be attributed to the inconsistency in letter-to-sound mapping in English.



Orthographic recall

- Within each language, orthographic recall showed a distinct pattern of emergence based on the letter/ akshara complexity.
- This could be attributed to the nature of orthography.
 - *Letter knowledge* is the knowledge of name and sound in alphabetic orthography (Seymour et al., 2003).
 - However in Malayalam (and most of the Indian alphasyllabaries) the name of the *akshara* and its sound are essentially the same; hence *akshara knowledge* requires the mastery of a single *akshara* name-sound (except for *anuswara* and *visarga*).



Conclusion

- This study provides preliminary evidence for differential pace of acquisition of literacy skills in children learning to read in two distinct languages and writing systems – alphabetic and alphasyllabic - in parallel.
- There is gradual development of phonological awareness and orthographic recall in Malayalam perhaps reflecting the influence of orthography to phonology mapping.
- Superior word reading in Malayalam than in English reflects the influence of orthographic depth.

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- Participants