Article

Catch Them Before They Fall: A Simple Test of Sight-Word and Pseudo-Word Reading in Kannada for a Quick and Early Assessment

Marita Saldanha[1], Anand Siddaiah[1], Avinash M. Veerappa[2], Nallur B. Ramachandra[2], and Prakash Padakannaya[1]

Abstract

The challenge of mastering reading is universally seen across all populations and languages. A small fraction of students all over the world, however, fail in learning to read proficiently. Early assessments can help children who are likely to get into the vicious circle of failure in mastering word reading, leading to poor academic performance and eventually to low motivation in academics and possible lifelong socioeconomic and mental health consequences. In languages such as English, there are quite a few tests available for early assessment and interventions. In India, a multilingual society, all children going to school learn to read at least in three languages, including English. Dearth of suitable assessment tools in local languages is a major impediment in clinical services and research. Here, we report an attempt at developing a quick and reliable test for assessment of decoding and sight-word reading skills in Kannada language.

Keywords

sight-word reading, pseudo-word reading, Kannada, early assessment, primary schoolchildren

Introduction

During the early schooling phase, the ability to master reading is undoubtedly the premier academic achievement. It prepares the children for all their educational endeavors and is a key to the possibilities that the future has in store for them (Bialystok, Luk, & Kwan, 2005). When beginning to receive formal instruction in reading, a large majority of children show no difficulty in learning how to read and write under normal conditions. However, several millions of children and adults worldwide, despite having average or above average cognitive abilities, adequate educational conditions, normal hearing and vision, have specific impairment in picking up reading (Schulte-Körne et al., 2007). Well-designed literacy assessments help identifying the problem of students in literacy development and guiding appropriate instruction needed (Black & Wiliam, 2003; Helman, 2005; Hu & Commeyras, 2008; National Council of Educational Research and Training, 2006; Shaywitz & Shaywitz, 1994; Torgesen, 2000).

India is one of the largest functionally multilingual countries in the world (Annamalai, 2001). The Report of the Education Commission (1964-1966) of Central Government of India recommended the Three-Language Formula (TLF), which necessitates all primary schools to teach three languages to pupils (Kothari, 1966). The TLF includes mother-tongue or the regional language; the official language of the Union or the associate official language so long as it exists; and a modern Indian or foreign language not covered above and other than that used as a medium of instruction. After the approval of the parliament, it was incorporated into the National Policy on Education in 1968, and today almost all schools in India expose their students to the learning of three languages. In the state of Karnataka (where the present study was conducted), majority of the schools teach Kannada, English, and Hindi. Kannada, a Dravidian language, is the official language of Karnataka State and is spoken by about 50 to 60 million people in India. It is an agglutinative, highly inflective language, which follows subject–object–verb order canonically. Kannada orthography is an alphasyllabary, in which orthographic units (called akshara) represent syllables. It is a transparent orthography. As the grain size is larger, it has a larger set of symbols. Furthermore, it has hardly a few monosyllabic words, the most common words having two or three syllables (more details of Kannada may be seen in Prakash & Joshi, 1989, 1995). Hindi, a major

[1]Department of Psychology, University of Mysore, Mysore, India.
[2]Genomics Laboratory, Department of Studies in Zoology, University of Mysore, Mysore, India.

Corresponding Author:
Prakash Padakannaya, Department of Psychology, University of Mysore, Manasagangotri, Mysore 570 006, Karnataka, India.
Email: prakashp@psychology.uni-mysore.ac.in; prakashp99@gmail.com

language used all over India, belongs to the Indo-European family of languages. Both Kannada and Hindi orthographies are derived from a common source, Brahmi (Coulmas, 1989). English and the Indian writing systems have contrasting features with respect to transparency, grain size, and the orthographic principle (Padakannaya & Mohanty, 2004; Padakannaya & Ramachandra, 2011). Furthermore, different writing systems put different cognitive demands on readers, which are reflected in the way reading and spelling/spelling are acquired in those languages (Chengappa, Bhat, & Padakannaya, 2004; Padakannaya, Rekha, Vaid, & Joshi, 2002; Perfetti, 1999; Wang, Liu, & Perfetti, 2004; Ziegler & Goswami, 2006). In such multilingual settings where children are formally exposed to two or three languages simultaneously, testing needs to be done in all the languages children are learning for any assessment or diagnostic purposes.

There are several standard tests available for assessing reading ability in languages such as English that facilitate research studies and early assessment of reading skills in normal and at-risk children. However, in a multiliterate setting like India, there is dearth for such tools in local languages. There is an urgent need to develop tests in the Indian languages, which will help identify children in need for intervention. This will save them from the vicious circle of the mental trauma they would experience on account of academic difficulties. Here, we report an attempt at developing a quick and reliable measure for assessment of decoding and sight-word reading skills of higher primary and high schoolchildren in Kannada language, one of the major languages of India, in the lines of Test of Word Reading Efficiency (TOWRE) in English (Torgesen, Wagner, & Rashotte, 1999). The TOWRE, a widely used test in English, assesses sight-word efficiency and phonemic decoding efficiency by asking readers to read a list of high frequency words and another list of pseudo-words for 45 s each. The Performance on the first list provides a measure of one's sight-word reading, whereas the Performance on the second list provides an index of one's decoding ability. The present article presents a brief account of our attempt at developing a similar measure in Kannada with an assumption that development of such measures helps cross-linguistic comparisons in multilingual contexts prevailing in India.

Method

Participants

Fifty (30 boys and 20 girls) students, studying in an English-medium school and taught Kannada and English from the first-grade level, participated in the study. Their age ranged from 10 to 18 years. Twenty-six of them were studying at the middle school level (Grades 5-8), and 24 were from the secondary to the higher secondary level (Grades 8-12) as per the Indian school system.

Their inclusion in the study was based on the class teachers' checklist report endorsing that children were average or higher than average performers with consistency in academics and did not have any observable physical or psychological/behavioral/emotional problems on record. All of them belonged to middle or high socioeconomic families.

Procedure

The first phase involved preparing a list of words for sight-word efficiency (*drishti pada* in Kannada) and pseudo-words (*husi pada* in Kannada) for phonological decoding efficiency sections of the proposed Kannada test. The first author went through Kannada language textbooks of Grade Levels 1 through 5, made a list of words and frequency of their appearing in the textbooks. These words were arranged according to their frequency, that is, words of high frequency were placed at the beginning of the list, followed by words that were less frequent (the frequency ranged from 1 to 117). Following this, we performed a median split and considered the words above the median for the proposed list for sight-word reading. Of this list, we prepared two separate lists A and B of 72 words matching for frequency and mixing words of varied lengths and syllables in complexity. The mean frequency of words in Lists A and B was comparable (13.6 and 17.9), and the difference was not statistically significant. Both the lists were serially rearranged in the order of increasing frequency of words. Furthermore, two experienced primary school Kannada language teachers ranked the words based on their perception of how familiar the words were to schoolchildren. There was a very significant correlation between the raters (.95 and .93, respectively, on Lists A and B).

Two lists of 62 pseudo-words each were prepared for assessing phonological decoding skill. Pseudo-words (*husi pada*) were prepared by substituting a phoneme or a syllable of a real word by another without violating the orthographic rules of Kannada language. The composition and arrangement of pseudo-words within the lists were similar to those of sight-word (*drishti pada*) lists, that is, they were arranged in an increasing order of length and syllable/akshara complexity. Thus, at the end of the first phase, we had two lists (A and B), each for assessing sight-word reading skill and pseudo-word reading skill. The whole process of preparing the final list of words along with two helpers took about a month's time.

Reliability Measures

A new group of 10 students (6 girls and 4 boys) from a higher primary school participated in this part of the study aimed at checking the odd–even reliability and reliability coefficient for the whole test. Every participant was asked to read the lists of words arranged column wise on a sheet of paper, as quickly and accurately as possible on saying "start" until told to stop. They were instructed that they should skip words found difficult and proceed with the subsequent ones. The number of words correctly read in 45 s, and the total number of words read as well as the time taken to read the whole list was noted down. The order of administration of lists was randomized to control the order effect. The odd–even reliability

Table 1. Odd–Even Reliability and Reliability Coefficient of the Whole Test.

Subtest	Coefficient of odd–even reliability	Reliability coefficient of the whole test
Drishti pada A	.92	.96
Drishti pada B	.95	.97
Husi pada A	.96	.98
Husi pada B	.97	.98

Table 2. Test–Retest Reliability Measures.

Subtest	Form	First testing		Second testing		r_{AB}
		M	SD	M	SD	
Drishti (sight)	A	50.38	13.46	50.10	11.73	.98
Pada	B	52.02	12.04	51.02	10.98	.98
Husi (pseudo)	A	43.22	9.40	44.14	7.55	.91
Pada	B	43.00	8.49	43.06	7.20	.90
Total word	A	93.06	20.87	94.24	17.73	.97
Reading efficiency	B	95.02	19.31	94.08	16.63	.97

Table 3. Correlations Between Parallel Forms A and B.

	Pre-test		Post-test	
	r_{AB}	Significance	r_{AB}	Significance
Words read in 45 s				
PDE	.84	.0001	.81	.0001
SWE	.84	.0001	.84	.0001
Total words read				
PDE	.83	.0001	.72	.0001
SWE	.78	.0001	.63	.0001

Note. SWE = Sight Word Efficiency; PDE = Phonemic Decoding Efficiency.

and reliability coefficient for the whole test for sight-word and pseudo-word lists are presented in Table 1. All the measures exhibited a very high degree of reliability and internal consistency.

The stability-over-time or test–retest reliability was determined by administering these tests to a group of 50 children (30 boys and 20 girls from Grade Levels 4 through 12) twice with a gap of 2 weeks between testing sessions. The obtained mean, standard deviations, and correlation coefficient values of the pre- and post-test scores are shown in Table 2. The magnitude of the correlation coefficient values was .91 and above, which definitely meet the required criterion of .90 for such purposes (Nunnally & Bernstein, 1994). The alternate forms, used to assess sight-word and pseudo-word reading, were also found to be highly correlated (see Table 3).

Validity

The lists of sight words and pseudo-words were evaluated for validity. If these tests tap underlying reading skills, the reading scores should increase over the grade levels and the mean differences between lower and higher grades should be statistically significant.

A gradual increase in performance over the grade levels on all word lists was observed (see Figures 1-3). The results of the independent-samples t tests confirmed that the mean differences between lower grades (5 and 6) and higher grades (11 and 12) on the total score of forms A and B of sight words (*drishti pada*) and pseudo-words (*husi pada*) were significant, $t(10) = 3.28$, $p < .01$, and $t(10) = 3.19$, $p < .01$, respectively.

Conclusion

To make important decisions with respect to specific scores, a reliability of .90 is the bare minimum, and a reliability of .95 is considered the desirable standard (Nunnally & Bernstein, 1994). Most values in the present study reached or exceeded the minimum standard of .90. Thus, the reading lists constructed (given in the appendix) for assessing sight-word reading and pseudo-word reading are reliable tools that could be the resources available in Kannada for assessment
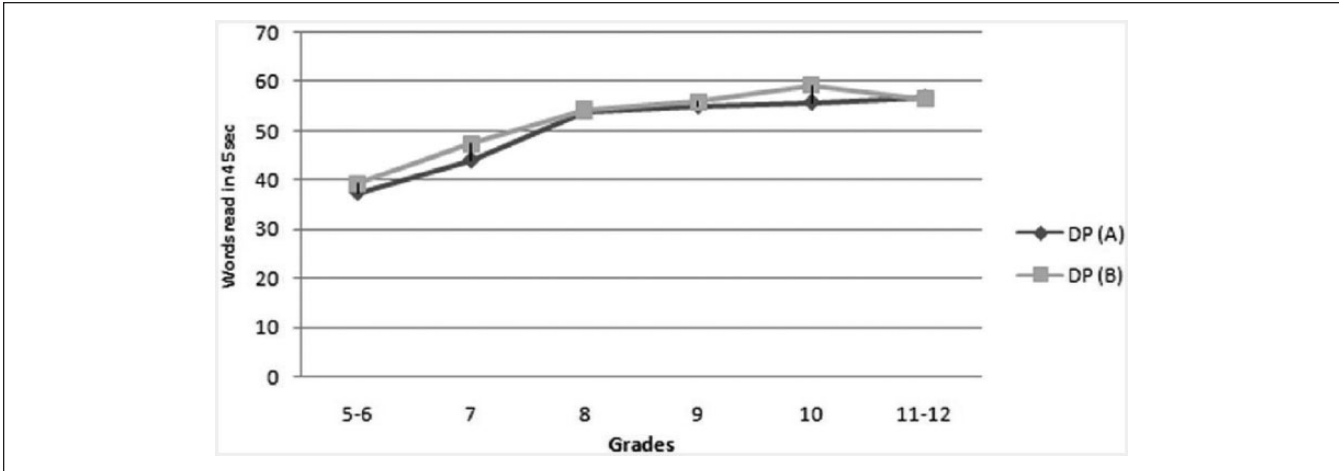
Figure 1. Mean number of sight words (DP) read in 45 s by different grade-level children.
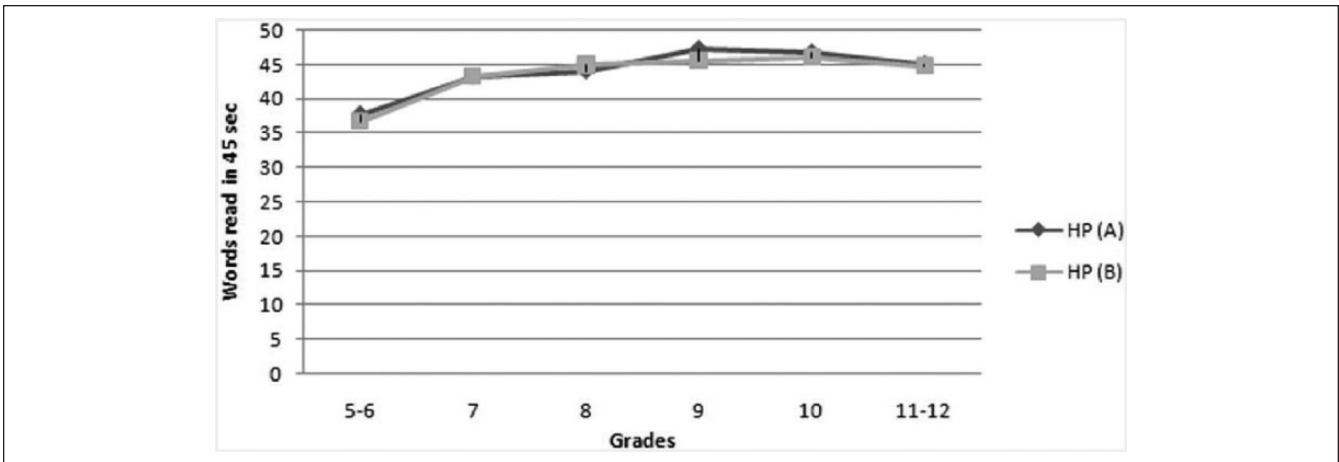*Note.* DP = *drishti pada.*

Figure 2. Mean number of pseudo-words (HP) read in 45 s by different grade-level children.
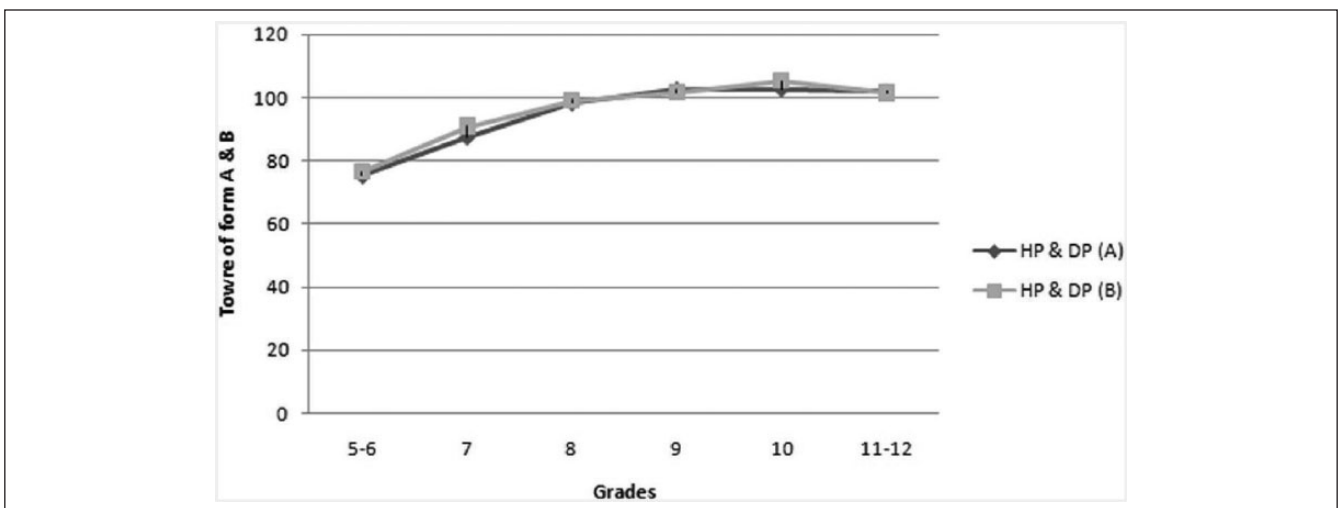*Note.* HP = *husi pada.*

Figure 3. Mean total number of words read by different grade-level children.
Note. HP = *husi pada*; DP = *drishti pada.*

and research purposes. The new measures also exhibited satisfactory criterion validity as the tests successfully differentiated between lower grade–level and higher grade–level students. We do believe that ours is an earnest, albeit small, attempt to address the need for developing valid and reliable measures in languages and orthographies that are less studied. It is not only beneficial for the population studied but also could be useful in bilingual/trilingual education studies and cross-linguistic comparisons. However, we acknowledge the limitation of the study in having a small sample with a broad age range. Future studies may further validate the measures we have presented here.

Appendix

Kannada pada vaachana pareekshe (Kannada word reading test)

APPENDIX

ಕನ್ನಡ ಪದ ವಾಚನ ಪರೀಕ್ಷೆ (Kannada Word Reading Test)

ದೃಷ್ಟಿ ಪದ (Sight Word Reading)

ತರಬೇತಿ ಪದಗಳು (Practice items)

ಜನ	jana
ರಾಗ	rāga
ಆಕಾಶ	ākāśa
ಭೂಮಿ	bhūmi
ಸಮೂಹ	samūha
ಬೆಳ್ಳಿ	beḷḷi
ಮುಖ್ಯಮಂತ್ರಿ	mukhyamaṃtri

ದೃಷ್ಟಿ ಪದ–Sight Word Reading- A

ಮರ	mara	ಘಂಟೆ	gaṃṭe	ಭಯಂಕರ	bhayaṃkara
ವನ	vana	ಎಲ್ಲ	ella	ಉಪವಾಸ	upavāsa
ಊಟ	ūṭa	ಅಮ್ಮ	amma	ಗೌರವಿಸು	gauravisu
ಹಣ	haṇa	ಎಲ್ಲಿ	elli	ಅಪಘಾತ	apaghāta
ಆನೆ	āne	ದೊಡ್ಡ	doḍḍa	ಗಾಳಿಪಟ	gāḷipaṭa
ದಿನ	dina	ಸಣ್ಣ	saṇṇa	ಹಿಂಬಾಲಿಸು	hiṃbālisu
ಇದು	idu	ಬೆಟ್ಟ	beṭṭa	ಶುಭಸಮಾರಂಭ	śubhasamāraṃbha
ಅದು	adu	ಸಾಯಂಕಾಲ	sāyaṃkāla	ಅಂಗವಿಕಲತೆ	aṃgavikalate
ಕಾಲು	kālu	ದೇವತೆ	dēvate	ಪ್ರಕೃತಿ	prakṛti
ಗಿಡ	giḍa	ಬೇಸಿಗೆ	bēsige	ಕೊಲ್ಲುವ	kolluva
ನೀರು	nīru	ಭೀಮಾರಿ	chīmāri	ಆಲೋಚಿಸು	ālōcisu
ಗುರು	guru	ಜೇನುಹುಳು	jēnuhuḷu	ಅಸಂಖ್ಯಾತ	asaṃkhyāta
ಮಳೆ	maḷe	ಸೋಲಿಗರು	sōligaru	ನಿಸ್ಸಹಾಯಕ	nissahāyaka
ಕೋತಿ	kōti	ದಾರಿಹೋಕರು	dārihōkaru	ಕಂಗೊಳಿಸು	kaṃgoḷisu
ಬೇಕು	bēku	ಸೂರ್ಯ	sūrya	ಆಶ್ಚರ್ಯ	āścarya
ಹೇಗೆ	hēge	ಹತ್ತಿರ	hattira	ಸ್ವಾತಂತ್ರ್ಯ	svātaṃtrya
ತಾಯಿ	tāyi	ಪುಟ್ಟ	puṭṭa	ಪ್ರತಿಜ್ಞೆ	pratijne
ದೇಶ	dēśa	ಸುಮ್ಮನೆ	summane	ಧೈರ್ಯಶಾಲಿ	dhairyaśāli
ಮಾಡು	māḍu	ಧ್ವನಿ	dhvani	ಮೊಮ್ಮಕ್ಕಳು	mommakkaḷu
ಬಂತು	baṃtu	ಜ್ಞಾನ	jnāna	ಮುಖ್ಯೋಪಾಧ್ಯಾಯ	mukhyōpādhyāya
ಮೇಲೆ	mēle	ರಾಜ್ಯ	rājya	ಕೃತಜ್ಞತೆ	kṛtajnate
ಗಂಡು	gaṃdu	ಎಷ್ಟು	eṣṭu	ಗ್ರಾಮಪ್ರದಕ್ಷಿಣೆ	grāmapradakśiṇe
ನಂತರ	naṃtara	ಎರಡು	eraḍu	ಕರ್ತವ್ಯನಿಷ್ಠೆ	kartavyaniṣṭhe
ಸಂಜೆ	saṃje	ಸ್ಫೂರ್ತಿ	sporti	ಸ್ಪರ್ಶಜ್ಞಾನ	sparśajnāna

ದೃಷ್ಟಿ ಪದ–Sight Word Reading-B

ಆಗ	āga	ಆಮೇಲೆ	āmēle	ಮಕ್ಕಳು	makkaḷu
ಆಟ	āṭa	ನನ್ನ	nanna	ಕತ್ತಲೆ	kattale
ಈಗ	īga	ಹಳ್ಳಿ	haḷḷi	ಬದ್ದರಾಗು	baddarāgu
ಊರು	ūru	ಇಲ್ಲಿ	illi	ಆರೋಗ್ಯ	ārōgya
ಮಗ	maga	ಅಪ್ಪ	appa	ವಾಯುವಿಹಾರ	vāyuvihāra
ನದಿ	nadi	ಕಣ್ಣು	kaṇṇu	ಸಮಾಧಾನ	samādhāna
ಮನೆ	mane	ಬಣ್ಣ	baṇṇa	ಪ್ರಾರ್ಥಿಸು	prārthisu
ತಲೆ	tale	ಬುದ್ಧಿ	buddhi	ವರದಕ್ಷಿಣೆ	varadakśiṇe
ಕಾಡು	kāḍu	ಸಂಭವಿಸು	saṃbhavisu	ಮನುಷ್ಯ	manuṣya
ರಾಜ	rāja	ಸೋದರ	sōdara	ವಿಶ್ವವಿದ್ಯಾನಿಲಯ	viśvavidyānilaya
ಹಾಡು	hāḍu	ಚೇತರಿಸು	cētarisu	ರಾಷ್ಟ್ರ	rāṣṭra
ಶಾಲೆ	śāle	ಘೋಷಣೆ	ghōṣaṇe	ದೃಶ್ಯ	dṛśya
ನಾವು	nāvu	ಸಂತೋಷ	saṃtōṣa	ಪ್ರಜ್ಞೆ	prajne
ಮಗು	magu	ಹೆಂಡತಿ	heṃḍati	ರೋಮಾಂಚನ	rōmāṃcana
ನೀನು	nīnu	ಶಬ್ದ	śabda	ಆಕರ್ಷಿಸು	ākarṣisu
ತೋಟ	tōṭa	ಸ್ನಾನ	snāna	ಅಡ್ಡಪಲ್ಲಕ್ಕಿ	aḍḍapallakki
ಬೇಗ	bēga	ಮೂರ್ಖ	mōrkha	ಕಾರ್ಯನಿವಹಿಸು	kāryanirvahisu
ದೋಣಿ	dōṇi	ಕಟ್ಟಡ	kaṭṭaḍa	ತೀರ್ಮಾನಿಸು	tīrmānisu
ಎಂದು	eṃdu	ಔಷಧ	auṣadha	ಸೂರ್ಯೋದಯ	suryōdaya
ಒಂದು	oṃdu	ಸಂಚಾರ	saṃcāra	ಪ್ರಥಮಚಿಕಿತ್ಸೆ	prathamacikitse
ಮುಂದೆ	muṃde	ಬಲಶಾಲಿ	balaśāli	ಮೃದುತ್ವ	mṛdutva
ಆನಂದ	ānaṃda	ತರಗತಿ	taragati	ಶಿಕ್ಷಣತಜ್ಞೆ	śikśaṇatajne
ಗುಂಪು	guṃpu	ಗೆಳೆಯ	geḷeya	ಗೃಹಾಲಂಕಾರ	gṛhālaṃkāra
ಗಂಡ	gaṃḍa	ಭಂಗನೆ	chaṃgane	ಕರ್ತವ್ಯ	kartavya

ಹುಸಿ ಪದ (Pseudoword Reading Test)

ತರಬೇತಿ ಪದಗಳು (Practice items)

ಊಪ	ūpa
ದಿಳ	diḷa
ಷಂತ	ṣaṃta
ಮಾಣಿಗ್ಯ	māṇigya
ಚೌಂಗರ್ಯ	cauṃgarya
ಭಕ್ಶಿಲು	bhakśilu

ಹುಸಿ ಪದ–Pseudoword Reading Test-A

ಅಗ	aga	ಪೆರಿಟ	periṭa	ಧುಗ್ನ	dhugna
ಅಟ	aṭa	ಸಿಂಡಿ	simḍi	ಬೊತ್ಮೆ	botme
ಹಗ	haga	ಪೀನಿ	pīni	ಗದ್ಭುಣಿ	gadbhuṇi
ವಮ	vama	ಸುಟ್ಟಿ	suṭṭi	ಕೃಡಾನೆ	kṛḍāne
ಈಪ	ēpa	ಜೋತು	jōtu	ಸ್ವಾಶನ	svāśana
ಡನ	ḍana	ಚೌಗು	caugu	ಹಿಸ್ಕಾರ	hiskāra
ಟಲ	ṭala	ಮೆಸೀಟು	mesīṭu	ಬೆಕ್ಶ್ಮೀ	bekśmī
ಖಚ	khaca	ಹೆಂಪು	hempu	ನಿಚೆಷ್ಠ	nicēṣṭha
ಹಮ	hama	ಮಂಗಿ	maṃgi	ಬ್ರಿನರ್ತಿ	brinarti
ಔತಧ	autadha	ಗುಡ್ಡಿ	guḍḍi	ನಿರ್ವಾಪ	nirvāpa
ಬಫ	bapha	ಸೆಳ್ಳ	seḷḷa	ಶಕ್ತಾಡಿ	śaktāḍi
ಈದಿ	īdi	ಪವ್ವ	pavva	ಯಶ್ಲೇಪ	yaślēpa
ಬಾವೆ	bāve	ಮುಬ್ಬಿ	mubbi	ನೇಸ್ಪತ್ರ	nēspatra
ದಾಯಿ	dāyi	ಭಮ್ಮೆ	bhamme	ಸ್ವಾಮಂತ್ರ್ಯ	svāmaṃtrya
ಹಿರಮ	hirama	ಸ್ಕಳ	skaḷa	ಸಷ್ಕೃತಿ	saṣkṛti
ತಿನೆ	tine	ತ್ರಿಸ್ಕ	triska	ಹಮ್ಯಾಕಿ	hamyāki
ಕೌದೆ	kaude	ಜ್ಞಾರ	jnāra	ದಿಕ್ಶಾಳ	dikśāḷa
ದೇಸು	dēsu	ಬ್ಲುಠ	bluṭha	ಬೆಕ್ಲೇಮ	beklēma
ನೀಪ	nīpa	ಕೇಲ್ಮಾ	kēlmā	ಎಸ್ಮೃತಿ	esmṛti
ಪಾಷು	pāṣu	ಗುಪ್ನ	gupna	ಉತ್ಕೃಮ್ಯ	utkṛmya
ದುಶೆ	duśe	ಗಬ್ಡ	gabda		

ಹುಸಿ ಪದ–Pseudoword Reading Test-B

ಇಬ	iba	ಮಟ	maṭa	ಸ್ಟಾಳೆ	stāḷe
ಈಕ	ēka	ಲೋಟಿ	lōṭi	ಪ್ಲಿಂಭ	plimbha
ಉಕ	uka	ಚಂಬ	caṃba	ನೀಸ್ಮ	nīsma
ಎಬ	eba	ವೀಫ	vīpha	ಸ್ಮಣರ	smaṇara
ಓಮ	oma	ಗೋಕು	gōku	ಸ್ವಾಶಮಿ	svāśami
ಟದ	ṭada	ಮಾರಳ	māraḷa	ದಾಬ್ಮರೆ	dābmare
ಪಗ	paga	ಎಡಮ	eḍama	ರಾಷ್ಟಯ	rāṣṭaya
ಪವ	pava	ರುಣಕೆ	ruṇake	ಬೆಂಪ್ಲ	bempla
ನಸ	nasa	ಮುಜ್ಜಿ	mujji	ನುಲ್ಕಣ	nulkaṇa
ಮಿಬ	miba	ಬೊಕ್ಕು	bokku	ಪೆಗ್ವಟ	pegvaṭa
ರಳ	raḷa	ಪೆಟ್ಟ	peṭṭa	ಭಕ್ತಾಚ	bhaktāca
ಹಚ	haca	ಲುಟ್ಟಿ	luṭṭi	ತಶ್ಲೇಪ	taślēpa
ಶುಮ	śuma	ಡಿಸ್ಸಿ	ḍissi	ಪ್ಲೆಂಡೆಸ	plemḍesa
ಮೈಪ	maipa	ರೊಗ್ಗ	rogga	ಸ್ಲಿಂತೃಕ	slimtṛka
ಬೀಸೆ	bīse	ಕೀಸ್ಸ	kīssa	ಹೊಬ್ಸಮ	hobsama
ವಾಂಪ	vāṃpa	ಜ್ಞಾಳ	jnāḷa	ಸಾಪ್ನಜ	sāpnaja
ಟಪೈ	ṭapai	ಪ್ರೇಟ	prēṭa	ಸುನ್ಯಾಲ	sunyāla
ದೋಲಿ	dōli	ಗ್ಲಾಂಪ	glāṃpa	ಸ್ಮೃಜಲ	smṛjala
ಬೇಖ	bēkha	ತ್ರಾಬೆ	trābe	ಸೀಕ್ಶರ	sīkśara
ಶಾಮ	śāma	ಪ್ಲಾಕ	plāka	ದುಷ್ಕೃಳ	duṣkṛḷa
ಶೌರಿ	śauri	ಪೆಕ್ತ	pekta		

References

Annamalai, E. (2001). *Managing multilingualism in India: Political and linguistic manifestations*. New Delhi, India: SAGE.

Bialystok, E., Luk, G., & Kwan, E. (2005). Bilingualism, biliteracy, and learning to read: Interactions among languages and writing systems. *Scientific Studies of Reading*, *9*, 43-61.

Black, P., & Wiliam, D. (2003). In praise of educational research: Formative assessment. *British Educational Research Journal*, *29*, 623-637.

Chengappa, S., Bhat, S., & Padakannaya, P. (2004). Reading and writing skills in multilingual and multiliterate aphasics: Two case studies. *Reading and Writing: Interdisciplinary Journal*, *17*, 121-135.

Coulmas, F. (1989). *The writing systems of the world*. Oxford, UK: Basil Blackwell.

Helman, L. (2005). Using literacy assessment results to improve teaching for English language learners. *The Reading Teacher*, *58*, 668-677.

Hu, R., & Commeyras, M. (2008). A case study: Emergent biliteracy in English and Chinese of a 5-year-old Chinese child with wordless picture books. *Reading Psychology*, *29*, 1-30.

Kothari, D. S. (1966). *Report of the Education Commission, 1964-1966: Education and national development*. New Delhi, India: Ministry of Education, Government of India.

National Council of Educational Research and Training. (2006). *Position paper: National focus group on teaching of Indian languages*. New Delhi, India: National Council of Educational Research and Training, Publication Department by the Secretary. Retrieved from http://www.ncert.nic.in/html/pdf/schoolcurri-culum/Position_Papers/Indian_Languages.pdf

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York, NY: McGraw-Hill.

Padakannaya, P., & Mohanty, A. K. (2004). Indian orthography and teaching how to read: A psycholinguistic framework. *Psychological Studies*, *49*, 262-271.

Padakannaya, P., & Ramachandra, N. B. (2011). Reading Akshara: Indian alphasyllabary. In P. McCardle, J. R. Lee, O. Tzeng, & B. Miller (Eds.), *Dyslexia across languages: Orthography and the brain-gene-behavior link* (pp. 76-95). Baltimore, MD: Paul H. Brookes.

Padakannaya, P., Rekha, D., Vaid, J., & Joshi, M. (2002, December). *Simultaneous acquisition of literacy skills in English and Kannada: A longitudinal study.* Paper presented at 13th World Congress of Applied Psycholinguistics (AILA), Singapore.

Perfetti, C. A. (1999). Comprehending written language: A blueprint of the reader. In C. Brown & P. Hagoort (Eds.), *Neurocognition of language* (pp. 167-208). New York, NY: Oxford University Press.

Prakash, P., & Joshi, R. M. (1989). Language representation and reading in Kannada—A south Indian language. In P. G. Aaron & R. M. Joshi (Eds.), *Reading and writing disorders in different orthographic systems* (pp. 223-230). New York, NY: Kluwer Academic Publishers.

Prakash, P., & Joshi, R. M. (1995). Orthography and reading in Kannada: A Dravidian language. In I. Taylor & D. Olson (Eds.), Scripts and reading: Reading and learning to read world's scripts (pp. 95-108). London: Kluwer Academic Publishers.

Schulte-Körne, G., Ludwig, K. U., Sharkawy, J., Nöthen, M. M., Müller-Myhsok, B., & Hoffman, P. (2007). Genetics and neuroscience in dyslexia: Perspectives for education and remediation. *Mind, Brain, & Education*, *1*(4), 162-172.

Shaywitz, B. A., & Shaywitz, S. E. (1994). Learning disabilities and attention disorders. In K. Swaiman (Ed.), *Principles of pediatric neurology* (pp. 1119-1151). St. Louis, MO: Mosby.

Torgesen, J. K. (2000). Individual differences in response to early interventions in reading: The lingering problem of treatment resisters. *Learning Disabilities Research & Practice*, *15*, 55-64.

Torgesen, J. K., Wagner, R. K., & Rashotte, C. A. (1999). *Test of Word Reading Efficiency: Examiner's manual*. Austin, TX: Pro-Ed.

Wang, M., Liu, Y., & Perfetti, C. A. (2004). The implicit and explicit learning of orthographic structure and function of a new writing system. *Scientific Studies of Reading*, *8*, 357-379.

Ziegler, J. C., & Goswami, U. (2006). Becoming literate in different languages: Similar problems, different solutions. *Developmental Science*, *9*, 429-436.

Author Biographies

Prakash Padakannaya is Professor of Psychology in University of Mysore, Mysore, India. His major research interests have been Reading, Orthography and Dyslexia across languages, Cognition, and Psycholinguistics. He is involved in behavioural (including eye tracking), neural, and genetic studies of reading and dyslexia.

Nallur B Ramachandra is Professor of Zoology (Genetics) in University of Mysore, Mysore, India. His major research interests have been Genomics of human diseases, Drosophila genetics, and Evolution. He is also the coordinator for the genetic data bases at the University (UMGC).

Marita Saldanha is currently a Ph. D. scholar in Psychology at University of Mysore, Mysore. She is also working as a Guest Lecturer at a local college. Her research interests include Reading, Dyslexia and Remediation.

Anand Siddaiah is currently working as a Psychologist in Tender Minds Pvt. Ltd, at Mysore. He is also a Ph. D. scholar in Psychology at University of Mysore, Mysore. His research interest involves Dyslexia and Mental health of school children.

Avinash Veerappa is currently working as a Guest Faculty of Genetics at University of Mysore, Mysore after obtaining his Ph. D. from the same University. His research interests include Human Genetics, Genomics, and Personalized Medicine. He is involved in Networking and pathway analysis, and Analysis of human disease genome sequencing.