Teaching the Indic Scripts: Tradition and Innovation

Renu Gupta, Ph.D.

renu@stanfordalumni.org

==

Language in India www.languageinindia.com
12 : 6 June 2012
Renu Gupta, Ph.D.
Teaching the Indic Scripts: Tradition and Innovation   <425-441>

<425-441>

Teaching the Indic Scripts: Tradition and Innovation
Renu Gupta

Abstract

The paper describes three approaches that are used to teach the symbols of Indic scripts, such as Devanagari—shape similarity, productive symbols, and through an alphabetic system.

1. Introduction

For centuries, the Indic scripts, such as Devanagari, have been taught the same way. These scripts are found in a wide swathe in Asia, stretching from Tibet, through India and Sri Lanka, and from Indonesia up to Cambodia.[1] India officially recognizes nine scripts —Bangla, Devanagari, Gujarati, Gurmukhi, Kannada, Malayalam, Oriya, Tamil, and Telugu. These scripts are derived from Brahmi, and since they follow the same organizing principle, they are grouped into a distinct writing system. Unfortunately, there is no agreement on a name for this writing system,[2] so here I have used their popular name, 'Indic scripts', which comes from their high concentration in the Indian subcontinent.

From a review of studies, Padakannaya and Mohanty (2004) show that reading acquisition in an Indic script follows a "simple to complex" order that is linked to the levels of complexity inherent in the script. The normal sequence is:

Simple basic letters→letters with vowel diacritics→ letters with ligatures → complex conjunct consonants

Hence, teaching also follows the same order. Learners are first taught to copy and recite the symbols in the *varnamala*, then they learn the consonant-vowel (CV) combinations [called the *barakhadi* in Devanagari and the *kagunita* in Kannada (Karanth, 2005)], and end with the ligatures; once this is done, learners begin to read and write words and sentences.

Although this approach worked well when literacy was restricted to the privileged elite,

<425-441>

demographic changes in the educational system may require new ways of teaching (Kumar, 1992). Some of the new entrants are illiterate adults and first-generation learners, who do not have parental support in learning. Another change is the three-language formula, where children may have to learn three different scripts of which two may be Indic scripts (Devanagari and the state language).

Most research studies examine Stages 2 to 4 after the basic symbols have been learned (Gupta, 2004; Gupta and Jamal, 2006; Karanth, 1992; Karanth, Mathew, and Kurien, 2004; Mishra and Stainthorp, 2007; Nag, 2007; Patel and Soper, 1987; Prakash, Rekha, Nigam, and Karanth, 1993; Ramaa, 2000; Vaid and Gupta, 2002; Vasanta, 2004). However, learning the basic symbols can present challenges for learners; Anand (1990) found that students in Hindi-medium schools were still making grapheme errors in Class 5 and this is borne out by the qualitative data in ASER (2011). Hence, this paper is concerned with issues in Stage 1 where the basic symbols are taught.

The paper first describes the traditional sequence that most of us are familiar with to highlight two characteristics—the systematic arrangement of the sounds and the presence of an inherent vowel. I then describe three recent approaches to teaching these scripts—shape similarity, productivity, and through knowledge of English. These three approaches depart from the traditional approach in two aspects—they do not teach the symbols in the traditional order and they are based on the user's perspective rather than a linguistic perspective.

This paper is merely an attempt to collate work done by other researchers and does not provide any experimental data. Two of the approaches – shape similarity and productive symbols – have been described in detail in an earlier paper (Gupta, 2008) and the use of shape similarity in Tamil can be found in Gupta and Seetha Lakshmi (2009). The third approach – teaching through knowledge of English – has not been documented elsewhere to my knowledge. One major problem is that although these approaches have been in use for a while, there is little experimental data about their effectiveness.

<425-441>

2. The Traditional Approach

As the Indic scripts spread through Asia, different languages and regions adopted different symbols to represent the sounds of the language. Table 1 shows the different symbols used to represent the sound /k/ in the nine scripts used in India.

Table 1. Symbols for /k/ in nine scripts in India

क	क	ક	ਕ	ಕ	ക	க	క	କ
Bangla	Devanagari	Gujarati	Gurmukhi	Kannada	Malayalam	Tamil	Telugu	Oriya

The phonological inventory remains essentially the same across different scripts. Tamil uses fewer symbols to represent phonemes, whereas Malayalam has added symbols for its larger phoneme base. Although the symbols differ, since these scripts come from the same source, their organizing principle is the same. Two properties concern us here: (a) the symbols are arranged systematically based on phonological principles, and (b) each consonant has an inherent vowel.

(a) Arrangement of the symbols

The symbols in an Indic script are arranged systematically based on articulatory phonetics. The phonological sequence is almost the same for all scripts in this writing system, and it is merely the symbols that differ. Figure 2 shows the arrangement of sounds for an Indic script along with the symbols used for Devanagari.

<425-441>

Table 2. Phonological Inventory of an Indic script

Vowels	Primary vowels	a अ	ā आ	i इ	ī ई	u उ	ū ऊ	ɽ ऋ
	Secondary vowels	e ए	ai ऐ	o ओ	au औ	ȧ अं	ah अः	

Consonants		Voiceless Plosives		Voiced Plosives		Nasals
		Unaspirated	Aspirated	Unaspirated	Aspirated	
Velar		kə क	kʰə ख	gə ग	gʰə घ	ŋə ङ
Palatal		tʃə च	tʃʰə छ	dʒə ज	dʒʰ झ	ɲə ञ
Retroflex		ʈə ट	ʈʰə ठ	ɖə ड	ɖʰ ढ	ɳə ण
Dental		tə त	tʰə थ	də द	dʰə ध	nə न
Labial		pə प	pʰə फ	bə ब	bʰə भ	mə म

Semi-vowels	jə य	rə र	lə ल	wə व
	shə श	ʂə ष	sə स	hə ह

Note: Each cell shows the pronunciation followed by the Devanagari symbol.

In the traditional method, students learn the symbols as they are laid out in the *varnamala,* reading along the rows. Hence, regardless of the language, the chant remains almost the same. Learners need to memorize the sequence, because, like the alphabet, it is used to organize items in dictionaries and lists; a more recent application is in text messaging on mobile phones, where multitap is used to access the required symbol (Gupta and Sornlertlamvanich, 2007).

The *varnamala* makes perfect sense to a linguist. When I showed a blank chart to an American phonetician, he was able to articulate all the sounds based purely on the phonetic description. However, reading and writing involve symbols and not sounds, so although it is easy to recite the sequence, learning the symbols is another matter. To

<425-441>

learners, many symbols look similar and it is not easy to distinguish between symbols. For example, in Devanagari the symbols for the related sounds /b/ and /bʰ/ look different (namely, ब and भ), whereas the symbols for the unrelated sounds /b/ and /v/ look similar (namely, ब and व). Such visual differences confuse the initial learner, and are addressed by the shape similarity method.

(b) The Inherent Vowel

Unlike the alphabetic writing system, the symbols in the *varnamala* do not represent phonemes; each consonant contains an inherent vowel, such as a schwa (Pandey, 2003), making it a syllable. So, in Devanagari the symbol क represents the sound /kə/, whereas in English, the letter <k> represents the sound /k/. In order to obtain a phoneme in an Indic script, a *virama* or *halant* has to be used. For example, a diacritic is placed below क /kə/ to get क् /k/.

Due to the presence of the inherent vowel, in some scripts it is possible to combine two symbols to create a word. For example, in Devanagari, the symbols for *k* and *l* can be combined to form *kal* (tomorrow); this is possible because the inherent vowel at the end of a word is automatically deleted in Devanagari (but not in Tamil, which requires an explicit diacritic called *pulli*). This property is exploited in the Productive Symbols approach.

In short, the characteristics of the Indic scripts differ from those of an alphabetic script, such as English. The innovations described below have re-examined the arrangement and properties of this writing system to make it easier for learners to grasp the base symbols of the script.

3. Teaching through Shape Similarity

In English, children frequently confuse the letters *b* and *d*, because these letters only differ in their orientation. For adult learners, who are already literate in one or two scripts, the issue is not sound-symbol correspondence but the visual shapes of the symbols. As an adult learning Japanese, I had no trouble reciting the sequence of sounds

<425-441>

in Hiragana and Katakana because they are similar to the *varnamala* sequence, but I kept confusing letters that looked alike, e.g., き and さ for /ki/ and/sa/ and シ and ツ for /shi/ and /tsu/. My Japanese teacher could not understand the problem because to her they were entirely separate entities since they appeared on different rows of the matrix. I eventually learned the two syllabaries through the *Kumon* method, which teaches them through shape similarity.

As early as 1938, we find a textbook by Kerslake and Aiyar (1938) to teach Tamil in English-medium schools through the shape similarity method. In the 1970s, the Central Institute of Indian Languages (CIIL) began developing materials based on shape similarity to teach literate adults an Indic script (Pattanayak, 1990; Sambasiva Rao, 1978). The rationale is driven by pattern recognition, which was pointed out by Lambert (1953).

The CIIL film, *Learn Devanagari*, groups the Devanagari symbols into 11 categories that are based on the similarity of their shapes (Table 3). Each group of symbols is presented in turn, and the learner's attention is drawn to visual details that distinguish one symbol from another. For example, viewers are instructed to 'notice the knot in म' and 'notice the line inside the letter ंब'. Each cluster contains a mixture of sounds. For example, Group 3 combines semi-vowels, consonants, and vowels. In each category, the first symbol is the simplest and requires the fewest strokes.

<425-441>

Table 3. Symbol clusters based on shape similarity

Group	Devanagari Symbols	Pronunciation
1	व, क, ब	w, k, b
2	ग, म, भ, भ़	g, m, b^h, $dʒ^h$
3	र, स, ख, ए, ऐ, श	r, s, k^h, e, ai, sh
4	ण, प, ष, फ	ṇ, p, ṣ, p^h
5	त, न, ल	t, n, l
6	ट, ठ, ढ, ढ़, द	ṭ, $ṭ^h$, $ḍ^h$, $ṛ^h$, d
7	ड, ड़, इ, ई, ह	ḍ, ṛ, i, ī, h
8	घ, ध, छ	g^h, d^h, $tʃ^h$
9	च, ज	tʃ, dʒ
10	उ, ऊ, अ, आ, ओ, औ	u, ū, ə, ā, o, au
11	य, थ	y, t^h

Apni Boli is a series of textbooks created by CIIL for several Indian languages and this method is also used to teach scripts through distance education (Sankaranarayanan, 2001). Recent books by CIIL teach the Indian script through two approaches—first the traditional sequence is taught and then symbols that are often confused are shown in a separate chart (see the textbook by Kalegowda and Thumbaramatti, 2001).

The shape similarity approach is used widely in Singapore to teach Tamil to schoolchildren as a second script (after English). It is termed the *da, pa, ma* method after the sounds for the symbols ட, ப, ம, which require simple strokes and are visually similar (for details, see Gupta and Seetha Lakshmi, 2009).

Such an approach can be applied to teaching the Indian languages in schools. If children have to learn two Indic scripts—Hindi and the state language—the second script can piggyback on students' knowledge of the first script. The instructional material and the teacher can assume that children can chant the *varnamala* sequence and should focus on the real difficulty—the different set of symbols. This method directs attention to what is not known, instead of wasting time on teaching the sound sequence all over again.

<425-441>

4. Teaching the Productive Symbols

In his book to teach the Persian script, Mace (1961) does not follow the traditional sequence of letters—*alef*, *be*, *pe*, *te*... Instead, small clusters of letters are taught together. In the first lesson, only three symbols are taught — ب ن ا for *a*, *n*, and *b* —along with a rule for how *alef* is joined to letters. With these three symbols, the learner can immediately read and write six words — *ba* (with), *ab* (water), *baba* (father), *an* (that), *nan* (bread), and *banna* (builder) —as well as short phrases (*with that water*). Note that the letters for /b/ and /n/ are visually similar and only the position of the dot differentiates them.

In Persian, English, and the Indic scripts, the first letter in the sequence of symbols is a vowel. Unfortunately, one cannot do much with a vowel; we need a consonant to create a word. This logic underlies the approaches followed by Eklavya (2003) and the Early Literacy Project (Jayaram, 2008), which teach symbols that can be used immediately to create words that have meaning for the child. Eklavya devised this method because the children come from the lower-socioeconomic strata of society, speak the local dialect and not Standard Hindi, and most are first-generation learners. Reasoning that children had to see a concrete outcome, Eklavya developed teaching material around symbols based on frequency of occurrence.

This method exploits an important feature of the Indic scripts—the presence of the inherent vowel in a consonant. As pointed out in Section 2, each consonant has an inherent vowel, usually a schwa. By combining two symbols, children can read and write words like *nal* (tap), *cup* (cup) and *bus* (bus). The words are carefully selected so that they are familiar words that can be represented in pictures. In addition, one diacritic has been introduced, which is used to write /a:/; this allows students to create words such as *maalaa* (garland).

The Introduction to the book (2003) states that the symbols will be taught in two stages. Stage 1 uses the following symbols:

<425-441>

Stage 1. क, ब, स, म, प, न, ल, ।

These symbols represent the following sounds: /kə/,/bə/,/sə/,/mə/,/pə/,/nə/,/lə/, and the diacritic for /a:/.

Where the traditional method begins by teaching the independent vowels, these are absent from the symbol set here because the independent vowel occurs only in word-initial cases; instead the more useful and commonly used form—the diacritic—is taught. Second, the eight symbols have the simplest shapes; there are no digraphs, such as ख (kʰ) and श (sh).

Set 2 expands the number of consonant symbols and introduces two further diacritics, allowing children to read and write numerous words and phrases.

Stage 2. र, घ, त, च, ह, थ, ड़, े, ि

These symbols represent the following sounds: /rə/, /gʰə/, /ʈə/, /tʃə/, /hə/, /ʈʰə/, /ɖə, and the diacritics for /e/ and /i/.

In such an approach, children are able to read and understand whole words from the start. In addition, they learn sound-symbol correspondence and can manipulate symbols to create new words. A similar approach is followed in the Early Literacy Project, the details of which are given in Jayaram (2008).

5. Teaching Through an Alphabetic System

In English-medium schools, children are introduced to an Indic script after they have learned the letters of the English alphabet, so some teachers draw on children's knowledge of English to help them form the symbols in the Indic script. At one school in North India, to learn the shape for अ, children are told that it is like the capital letter B. This may not be an effective strategy, because the Devanagari script uses different strokes than English (Lambert, 1953: 5). So, instead of writing ऊ, several children had written it with the tail moving out as ऊ, showing interference from the cursive script in English. Sassoon (1995) contains several examples of children's writing, where children

<425-441>

have incorrectly carried over strokes from the first writing system to their second one.

In my discussions with teachers in a few English-medium schools, their common perception was that English was an easier script to learn than Devanagari. This perception appears to be based on the number of symbols to be taught and learned: English has only 26 symbols, whereas an Indic script like Devanagari has 46 basic symbols, plus all the combinations in Stages 2 to 4. Here teachers are viewing teaching merely in terms of **copying** the symbols without addressing how the scripts operate to create words. So, although English has fewer symbols, there is a trade-off: a single letter may have to represent multiple sounds, as with the letter *a* (Barber, 1973), whereas in most of the Indic scripts (Tamil being one exception) a symbol represents one sound.

Sometimes, the principles of an alphabetic system are incorectly extended to teaching an Indic script. In one English-medium school, knowledge of the principles of the English writing system is used to teach children the Devanagari script. In Lower KG children learn to **copy** the letters of the English alphabet and spell a few words. From this, teachers assume that children have learned how the alphabetic writing system works— they have learned to segment sounds (phonological awareness), realize that there is a match between letters and sounds (grapheme-phoneme correspondence), know that one letter can have different sounds (as in the letter <a>), recognize that one sound can have different letters (as in the sound /k/), etc. In actual fact, none of this is taught, but teachers assume that children have this knowledge about writing and have formed assumptions about how writing works. So, in Upper KG instruction in Devanagari draws on this assumed knowledge of writing.

In teaching Devanagari, the children are not forced to trace the letters; instead they select the symbols from boxes that are organized by color (blue for vowels and pink for consonants) as well as perceived difficulty. The traditional *varnamala* sequence is not followed; instead symbols are presented according to a plan of difficulty. Some of these boxes are shown in the figure below.
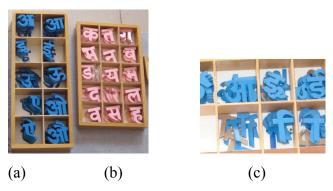
<425-441>

Figure 1. Boxes containing Devanagari symbols. (a) Vowels. (b) Consonants. (c) Vowels with associated diacritics (*matras*).

Using these symbols, children are taught to create Hindi words. Due to the presence of an inherent schwa in Devanagari, it is possible to create some words using the base symbols without adding a vowel; for example, the word *kamal* can be created from three symbols – *k*, *m,* and *l* – but this approach ignores this inherent vowel. Instead, children are taught to form the word *kamal* by adding vowels and end up with an incorrect word – *kaamaal* (see Figure 2).

Figure 2. *Titli* (butterfly) and *kamal* (lotus) with unnecessary vowels

The stated rationale is that "the children expect words to have vowels", which the Indic scripts do have except they are not depicted explicitly and linearly. Here, the Indic scripts have been viewed through the "alphabetic lenses" of English-speaking adults Karanth (2002) rather than through the eyes of four-year-old children for whom terms such as vowels and consonants make no sense.   By the same logic, we could teach children to write English words using the characteristics of an Indic writing system—the visuo-spatial layout, diacritics and *virama*. The word *pens* would be written as follows:

<425-441>

The effects of this approach emerge in Class 1 where a traditional approach to Devanagari is used. According to the teacher, the children face problems in Hindi dictation, which is a fairly simple task given the close sound-symbol correspondence in Devanagari. Since these children have not grasped the basic logic of an Indic script, they keep inserting unnecessary vowels and have to unlearn what was taught.

6. Discussion and Conclusion

This paper pulls together some innovations in the teaching of the Indic scripts, using examples from Devanagari and Tamil. The shape similarity approach re-examines what constitutes difficulties for learners of a second script and devises instruction around visual similarity and stroke complexity. In the productive symbols approach, meaning and relevance are introduced from the start; a few symbols are used to instantly create meaningful words that the learner can read and maybe write. The third approach, which draws on knowledge of the English writing system, is unfortunately based on a fundamental misconception of the Indic writing system and gives learners an incorrect view of how the system works.

These new approaches offer alternatives where traditional methods of teaching do not work. In Singapore, where mother-tongue education (MTE) in Tamil poses problems for school children, the Ministry of Education continuously modifies the Tamil curriculum to align it with learner needs (Gupta and Seetha Lakshmi, 2009). In India, the diverse educational settings – illiterate adults, children who are first-generation learners, school children learning their first or second Indic script, etc. – should make us adapt our teaching methods to the learner's prior knowledge instead of relying on a 'one-size-fits-all' approach. For example, when school children have already learned an Indic script, the second Indic script can use the shape similarity approach. At the same time, we have to be aware of resistance to changes in the traditional format. When the shape similarity approach was used in adult literacy programs in India, it met with resistance from the learners who were informed by their friends that this was the incorrect sequence.

References

<425-441>

Anand, V. S. (1990). *Hindi Spelling: Errors and Remedies*. New Delhi: Bhavana Prakashan.

ASER (2011). *Annual status of education report (rural) 2010*. Available at http://images2.asercentre.org/aserreports/ASER_2010_Report.pdf

Barber, E.J.W. (1973). The formal economy of written signs, *Visible Language*, 7(2), 155-166.

Bright, W. (1999). A matter of typology: Alphasyllabaries and abugidas, *Written Language and Literacy*, 2, 1, 45-55.

Daniels, P.T. (1992). The syllabic origin of writing and the segmental origin of the alphabet. In P. Downing, S.D. Lima, and M. Noonan (Eds.) *The Linguistics of Literacy* (pp. 83-110). Amsterdam: John Benjamins.

Daniels, P. T. (1996). The study of writing systems. In P. T. Daniels and W. Bright (Eds.), *The World's Writing Systems* (pp. 3–17). New York: Oxford University Press.

Eklavya (2003). *Padho Likho Maza Karo: Part 1*. Bhopal: Eklavya.

Gelb, I. J. (1952) *A Study of Writing*. Chicago: University of Chicago Press.

Gupta, A. (2004). Reading difficulties of Hindi-speaking children with developmental dyslexia. *Reading and Writing: an Interdisciplinary Journal*, 17, 79-99.

Gupta, A. and Jamal. G. (2006). An analysis of reading errors of dyslexic readers in Hindi and English. *Asia Pacific Disability Rehabilitation Journal*, 17, 1, 73- 86.

Gupta, R. (2008). Initial literacy in Devanagari: What Matters to Learners. *South Asian Language Pedagogy and Technology,* 1.

Gupta R. and Seetha Lakshmi (2009). Using shape similarity to teach Indic scripts. *Indian Linguistics*, 70, 135-148.

Gupta, R. and Sornlertlamvanich, V. (2007). Text Entry in South and Southeast Asian scripts. In I. Scott MacKenzie & K. Tanaka-Ishii (Eds.), *Text Entry Systems: Mobility, Accessibility, Universality* (pp.227-249). Morgan Kaufmann.

Hosking, R.F. and Meredith-Owens, G.M. (1966), *A Handbook of Asian Scripts*. Cambridge: University Printing House.

<425-441>

Holle, K. F. (1999) Table of old and new Indic alphabets: Contribution to the paleography of the Dutch Indies. *Written Language and Literacy*, 2, 2, 167- 246.

Jayaram, K. (2008). Early literacy project—explorations and reflections Part 2: Interventions in Hindi classrooms, *Contemporary Education Dialogue*, 5,3, 175- 212.

Justeson, J.S. (1976) Universals of language and universals of writing. In A. Juilland, A.M. Devine and L.D. Stephens (eds.) *Linguistic Studies offered to Joseph Greenberg*. Saratoga: Anma Libri.

Justeson, J.S. and Stephens, L.D. (1994) The evolution of syllabaries from alphabets: Transmission, language contrast, and script typology. *Die Sprache*, 35, 2-46.

Kalegowda and Thumbaramatti, S.M. (2001). *Bharatiya Bhasha Jyothi: Kannada*. Mysore: Central Institute of Indian Languages.

Karanth, P. (1992) Developmental dyslexia in bilingual-biliterates. *Reading and Writing: An Interdisciplinary Journa*l, 4, 3, 297-306.

Karanth, P. (2002). Reading into reading research through nonalphabetic lenses: Evidence from the Indian languages. *Topics in Language Disorders*, 22, 5, 20- 31.

Karanth, P. (2005). The Kagunita of Kannada – Learning to read and write an Indian alphasyllabary. In R. M. Joshi & P. Aaron (Eds), *Handbook of Orthography and Literacy*, Lawrence Erlbaum.

Karanth, P., Mathew, A. and Kurien, P. (2004). Orthography and reading speed: Data from native readers of Kannada. *Reading and Writing: an Interdisciplinary Journal*, 17, 101-120

Kerslake, P. C. and Aiyar, C.R. Narayanaswami (1938). *Tamil Course for European Schools*. Madras: The Christian Literature Society for India.

Kumar, K. (1992). *What is Worth Teaching?* New Delhi: Orient Longman.

Lambert, H.M. (1953). *Introduction to the Devanagari script for students of Sanskrit, Hindi, Marathi, Gujarati, and Bengali*. Oxford University Press.

Mace, J. (1961). *Modern Persian (Teach Yourself)*. Teach Yourself Publishing.

Mishra, R. and Stainthorp, R. (2007). The relationship between phonological awareness and word reading accuracy in Oriya and English: A study of Oriya-speaking fifth graders. *Journal of Research in Reading,* 30, 1, 23-37.

<425-441>

Nag, S. (2007). Early reading in Kannada: the pace of acquisition of orthographic knowledge and phonemic awareness. *Journal of Research in Reading,* 30, 1, 7-22.

Padakannaya, P. and Mohanty, A. K. (2004). Indian orthography and teaching how to read, *Psychological Studies*, 49, 4, (2004): 262-271.

Patel, P.G. (2004). *ReadingAacquisition in India: Models of Learning andDdyslexia.* New Delhi: Sage Publications.

Pandey, P. K. (2003). Phonetic and phonological bases of Hindi orthography. In P. Bhaskararao (Ed.) *Working Papers of International Symposium on Indic Scripts: Past and Future* (pp.41-61). Tokyo: ILCAA.

Patel, P.G. and Soper, H.V. (1987) Acquisition of reading and spelling in a syllabo-alphabetic writing system. *Language and Speech*, 30, 69-81.

Pattanayak, D.P. (1990). *Language, education, and culture*. Mysore: Central Institute of Indian Languages. http://www.ciil-ebooks.net/html/educulture/coverpage.html

Prakash, P., Rekha, D., Nigam, R., and Karanth, P. (1993). Phonological awareness, orthography, literacy. In R. Scholes (ed.), *Literacy and language analysis* (pp. 55-70). Hillsdale, NJ: Erlbaum.

Ramaa, S. (2000). Two decades of research on learning disabilities in India. *Dyslexia*, 6, 268-283.

Sambasiva Rao, G. (1978). Literacy methodology. Mysore: Central Institute of Indian Languages. http://www.ciil-ebooks.net/html/literacy/coverpage.html.

Sankaranarayanan, G. (2001). Teaching Indian languages through correspondence. *Language in India*, 1: 8.

Sassoon, R. (1995). *The acquisition of a second writing system*. Bristol: Intellect Books.

Vaid, J. and Padakannaya, P. (2004). Introduction to the special issue of *Reading and Writing: an Interdisciplinary Journal*, 17, 1-6.

Vaid, J. and Gupta, A. (2002). Exploring word recognition in a semi-alphabetic script: The case of Devanagari. *Brain and Language*, 81, 679-690.

<425-441>

Vasanta, D. (2004). Processing phonological information in a semi-syllabic script: Developmental data from Telugu. *Reading and Writing: an Interdisciplinary Journal*, 17, 59-78.

Notes

---

[1] It includes the scripts for Singhala, Burmese, Thai, Lao, Mon, and Khmer. Indonesia has the following scripts that have been replaced by Bahasa in the Roman script: in the island of Java, there are Javanese, Balinese, Sundanese, and Madurese; in Sumatra, we have Batak, Lampong and Rejang; in Sulawesi, we find Buginese and Macassarese. In Japan, a form of the Indic scripts is found in Siddham (Bonji), but this is restricted to writing Buddhist scriptures. The symbols for these scripts are listed in Hosking and Meredith-Owens (1966) and Holle (1999).

[2] These scripts have been called quasi-syllabaries (Gelb, 1952; Justeson & Stephens, 1994), semi-alphabetic scripts (Vaid & Gupta, 2002), semi-syllabic scripts (Vaid & Padakannaya, 2004), and alphasyllabaries (Bright, 1999) to indicate their mixed nature. Daniels (1992, 1996) prefers the neutral term *abugida*, but this is not used much.

<425-441>