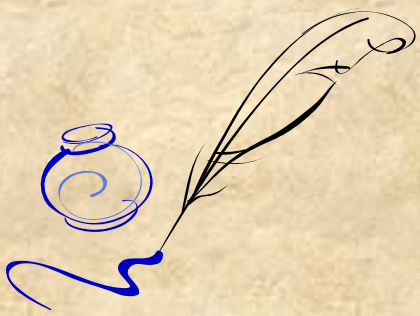
Brahmi's Children: Variation and stability in a script family

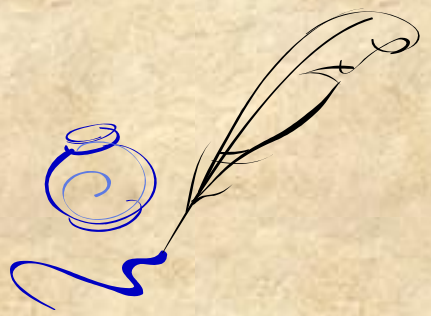
Amalia Gnanadesikan

March 26, 2019

AWLL 12, Cambridge

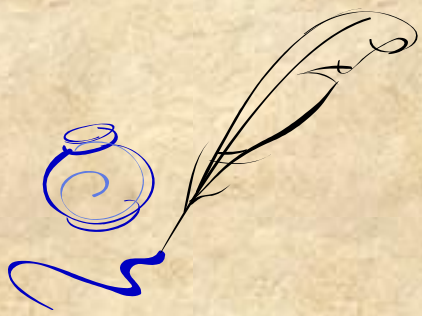


Brāhmī: Variation and stability in a script family



Brāhmī: Variation and stability in a script family

- "[Brāhmī] constitutes one of the most important 'parent' scripts of the world, rivaling Aramaic and Arabic in the number and range of its varieties and derivatives." (Salomon 1996: 374)



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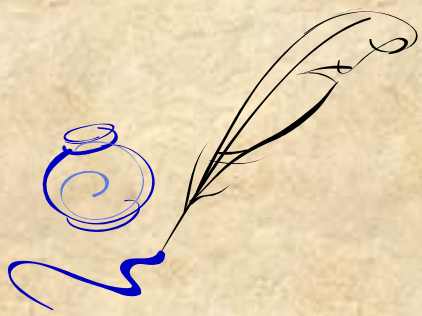
- "[Brāhmī] constitutes one of the most important 'parent' scripts of the world, rivaling Aramaic and Arabic in the number and range of its varieties and derivatives." (Salomon 1996: 374)
- "This characteristically Indian script type … is remarkably stable, and nearly all the later Indic and extra-Indic scripts derived from it follow essentially the same system." (Salomon 1996: 376)

History

- Brahmi: attested from about C 3 BCE to C 4 CE, by which time N & S varieties
- First writes Prakrit (MIA), then Sanskrit (OIA)
- Regional diversification (C 5 – 9)
- Modern scripts develop C 10 to 15



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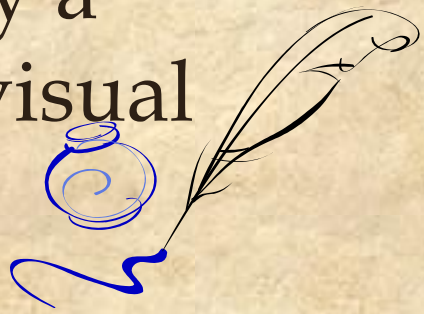
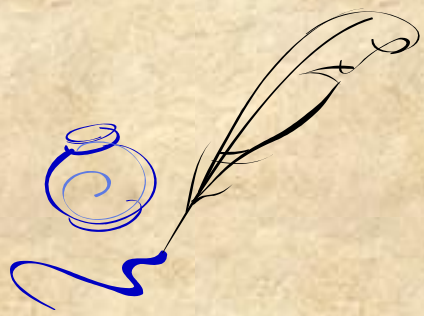
- "All of this variation presents—to the investigator—difficulties of merely a mechanical sort, a burden on the visual memory." (Masica 1991: 145)



Example: Devanagari

- स, सा, सि, सी, सु, सू, सृ, से, सै, सो, सौ, स्
- /sa/, /saː/, /si/, /siː/, /su/, /suː/, /sr̥/, /se/, /sai/, /so/, /sau/, /s/



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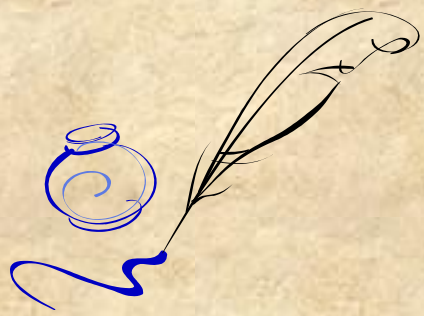

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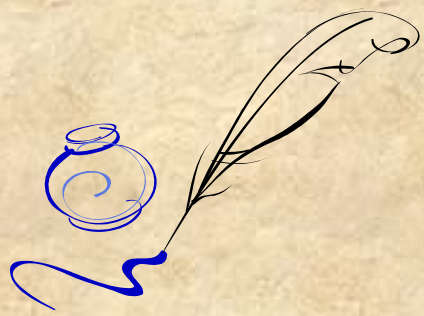

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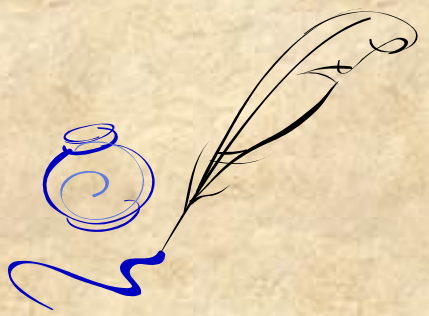
- Names: akshara system, abugida, alpha-syllabary, semi-alphabet, semi-syllabary, syllabic alphabet, neosyllabary

Devanagari Example, cont.

ब = /ba/ = [bɐ], [bə]



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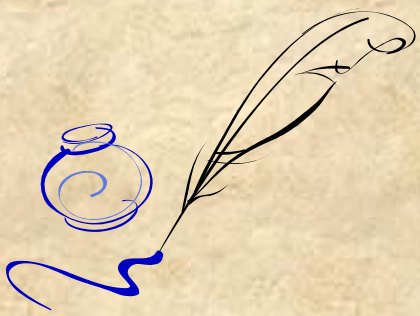

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बस	हिन्दी	दोस्ताना	अगर
b a s	h i n d ī	d o s t ā n ā	a g a r
‘enough’	‘Hindi’	‘friendly’	‘if’
‘bus’			

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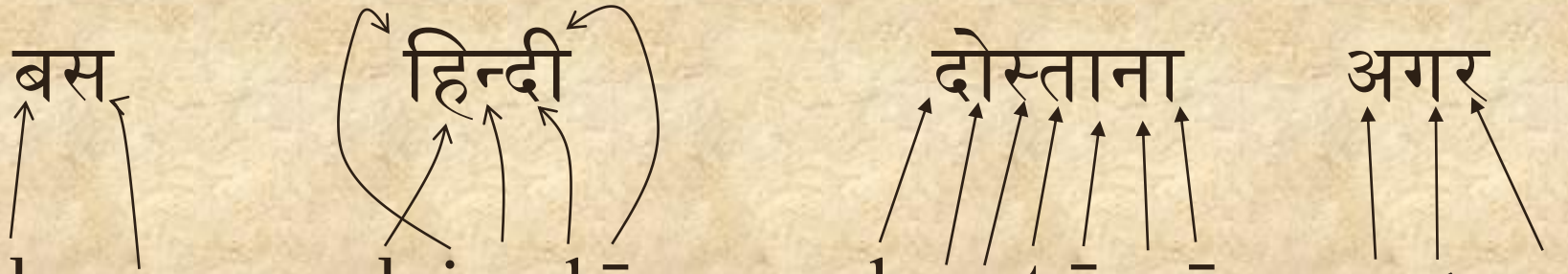

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“Remarkably Stable”?

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Very stable elements

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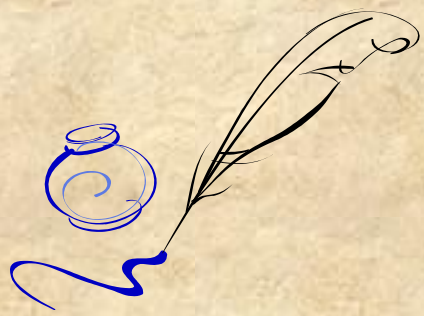

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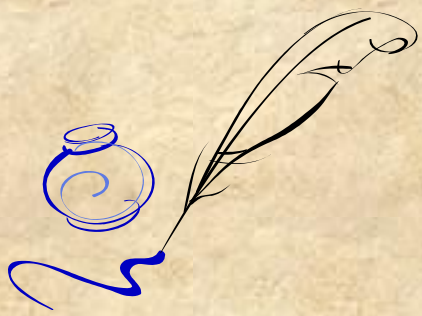
- Other vowels “dependent” (= diacritic or “satellite” [Elliott 2012])



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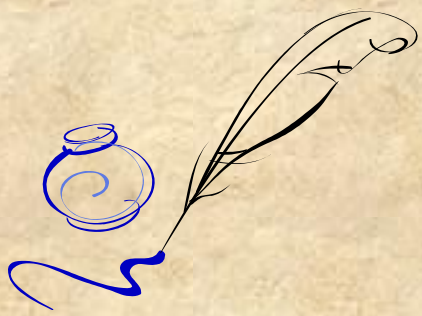
- "Inherent vowel" used (except for Lao, by governmental reform, 1975)
- Other vowels "dependent" (= diacritic or "satellite" [Elliott 2012])
- *Some* divergence from linear order (some Vs to left of C, surround C, or attached to C_1 rather than C_2 in CCV)

Fairly typical elements

- Initial vowels are independent



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- Sequential Cs at least sometimes written as conjuncts
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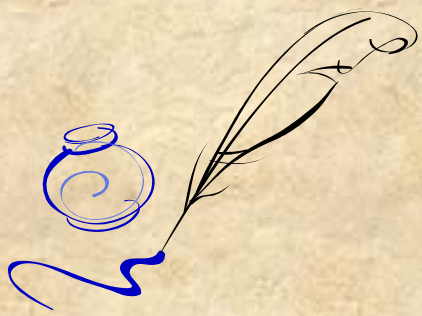

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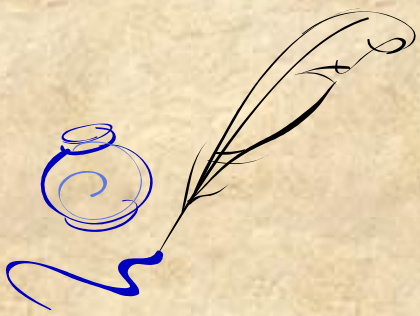

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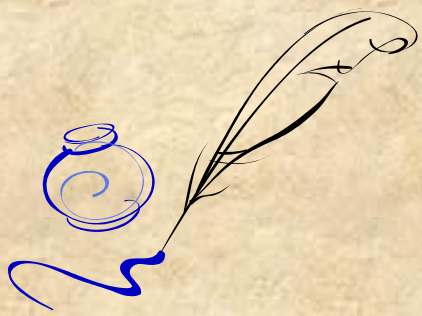
- Retention of Sanskrit inventory
  - but not in Gurmukhi, Tibetan, Tamil, Lao

Variation

- Lack of inherent V must be marked (obligatory "virama")
  - Yes: Oriya, Malayalam, Kannada, Telugu, Sinhala, Burmese
  - No: Devanagari, Gujarati, Gurmukhi, Bangla, Tibetan, Khmer, Thai



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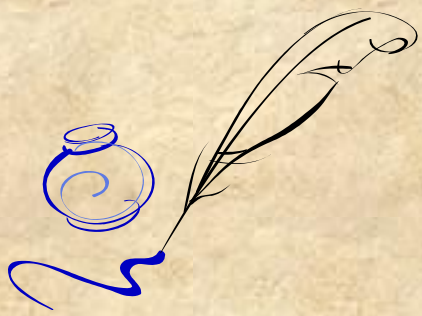

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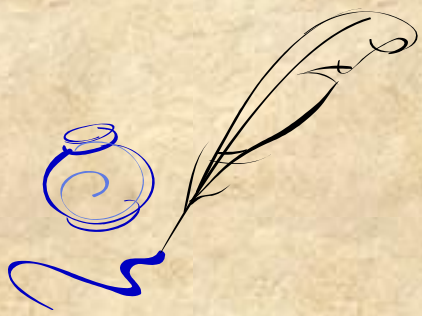
- Shape of the letters!

Rare elements

- Syllable marking (Tibetan only, some indirectly in Thai and Lao)



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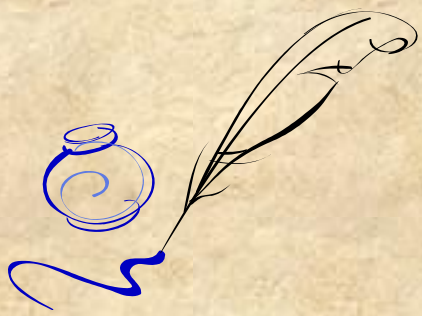

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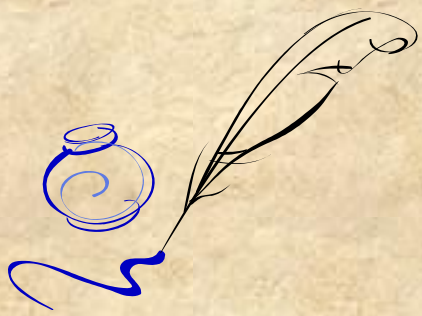

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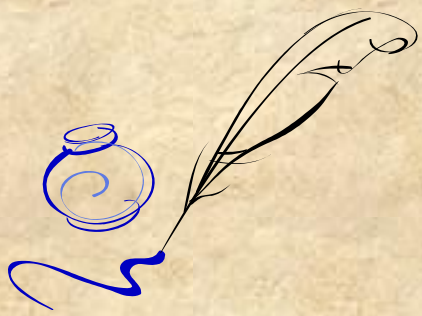

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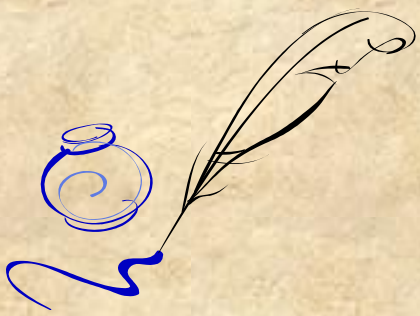

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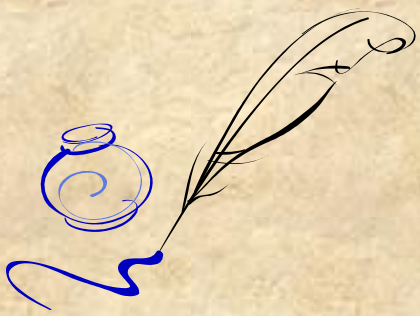

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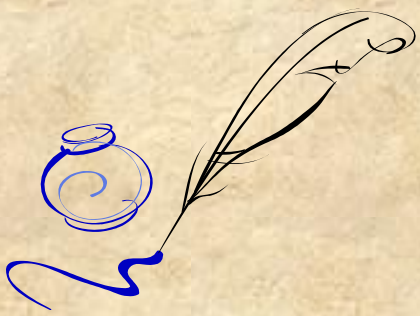

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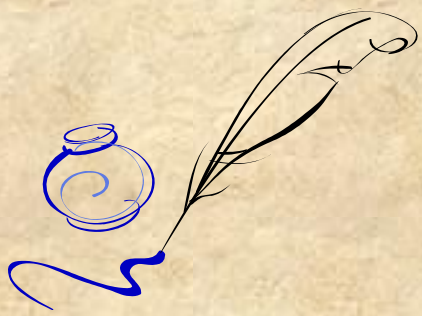
- Has spread to many other languages

How “stable” is Arabic?

- Letter forms unchanged (different stylistic traditions become standardized)



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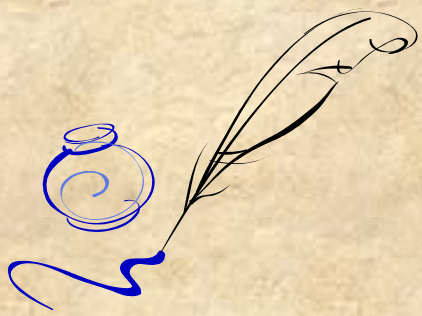

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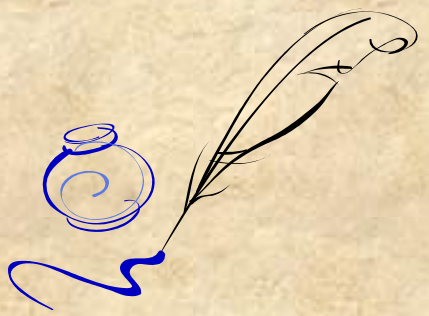

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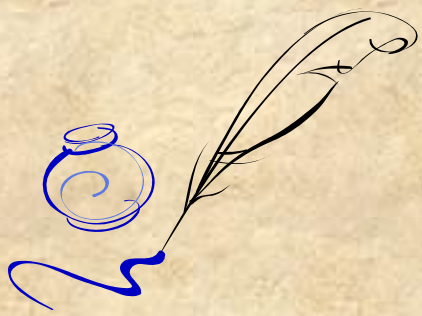
  - Arabic: Long Vs only (short Vs rarely, diacritic)
  - Farsi: Long Vs; all final Vs (short Vs rarely diacritic)
  - Sorani: All Vs but one (full letters)
  - Kashmiri: All Vs (diacritic & full, mixed)
  - Uyghur: All Vs (full letters)

Variation and stability compared

Brahmi's children

- Inherent V
- Dependent Vs
- Some lack of linear order
- Direction



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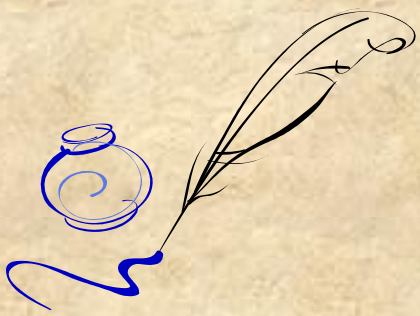

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Arabic variants

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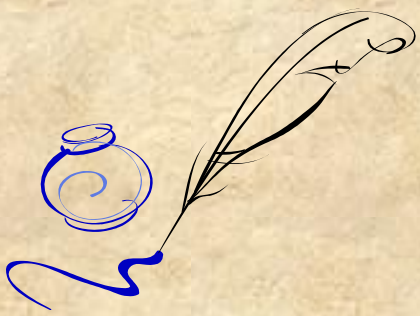
- Way of connecting letters
- Direction



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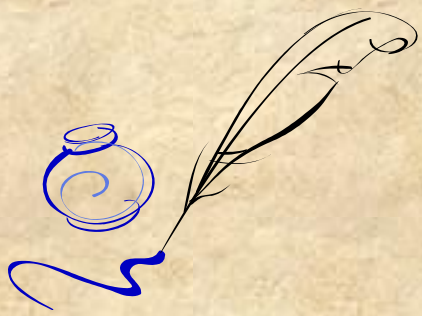
Arabic variants

- Shapes
- Way of connecting letters
- Direction

- Which vowels are written
- How vowels are written

Why Brahmi's variations?

- "Writing was not a religious monopoly in India, nor … was it regarded as particularly sacrosanct by the religious establishment, or by the population at large." (Masica 1991: 143)



Why Brahmi's variations?

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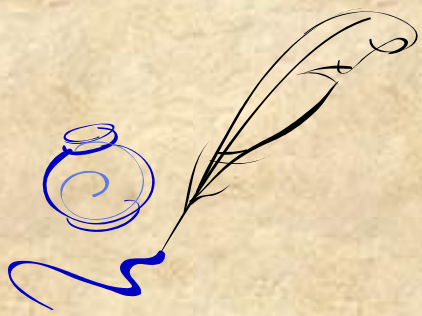
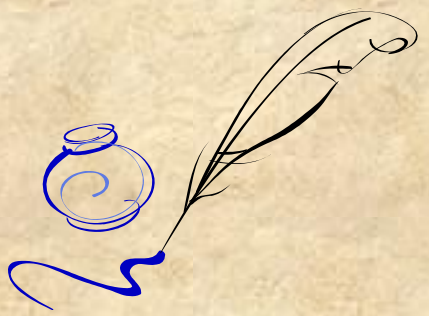
- "[I]ntellectual activity in India has always strongly favored oral over written means of expression…" (Salomon 1995: 278)



Why Arabic's stability?

- "With the spread of Islam from Spain to Indonesia and much of Africa—and along with it the Holy Qur'ān, which according to custom and tradition must be studied in the original Arabic along with the faithful's Classical Arabic prayers—there soon developed a powerful influence of both the Arabic language and its script on the new converts." (Kaye 1996: 743)

But then, why Brahmi's *stability*?



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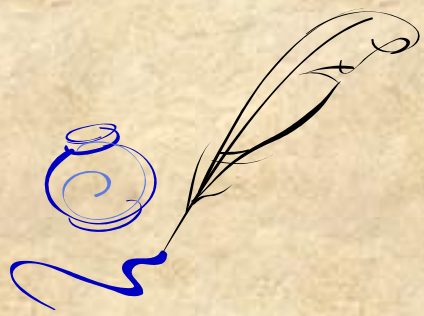

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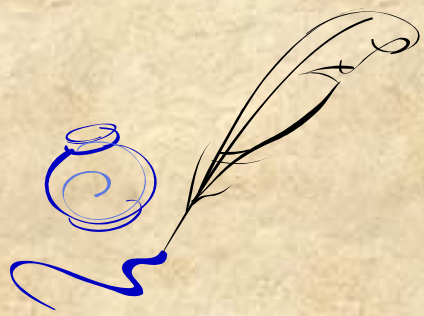

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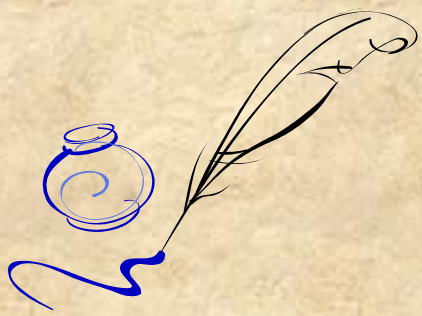

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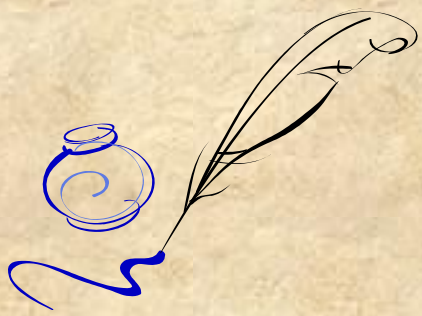

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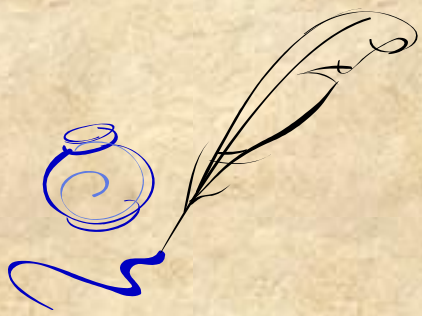

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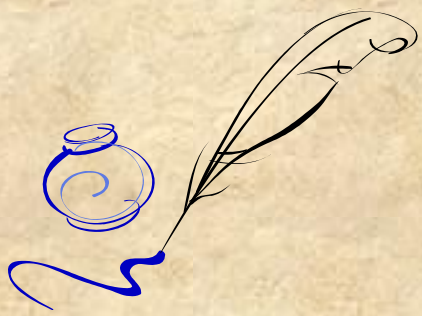

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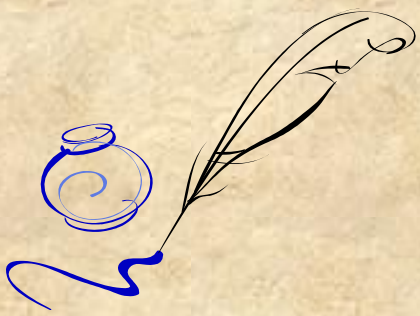

Origin of the Inherent Vowel

- Brahmi adapted from Aramaic and Kharoṣṭhi (Salomon 1995)
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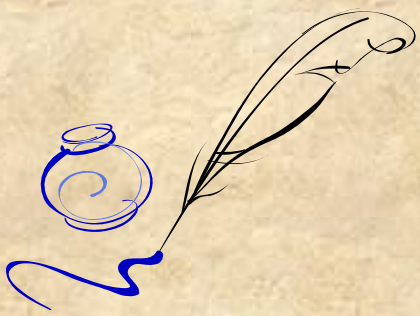

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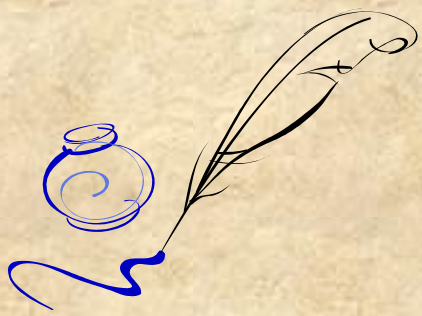

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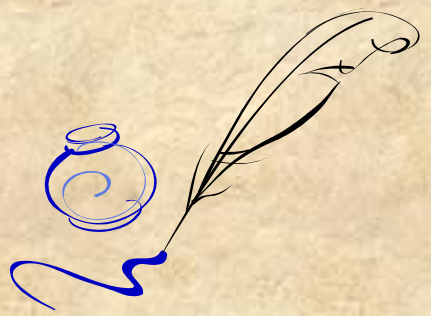
- "[I]t would appear that recitation of letter values ([kə], [gə], etc.) underlies the development of these scripts." (Justeson & Stephens 1993: 9, emphasis added)

Retaining the inherent vowel

- Resulting script is “alphasyllabic.” Simplest signs (aksharas) are simple syllables.



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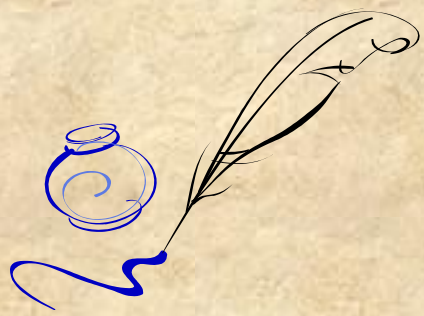

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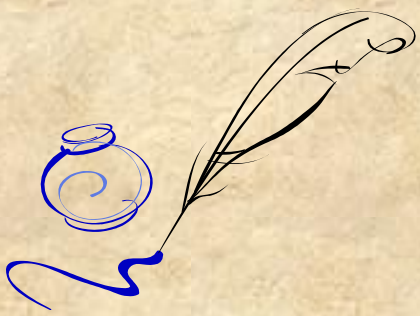

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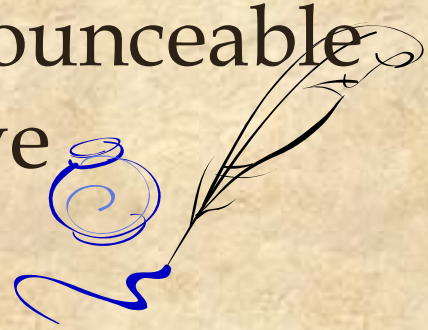
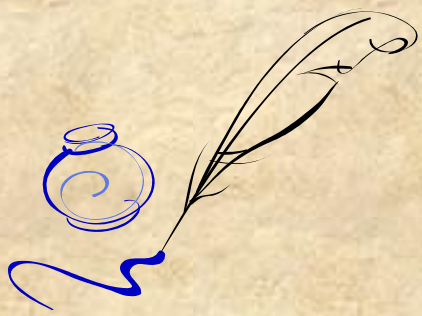
- Mappability of aksharas to pronounceable units is relevant to each successive generation of learners



Conclusion

- The akshara model of inherent vowel and dependent vowels is particularly stable because it *allows the learner to map written units to pronounceable units*.



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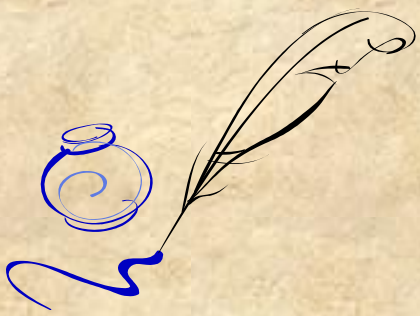

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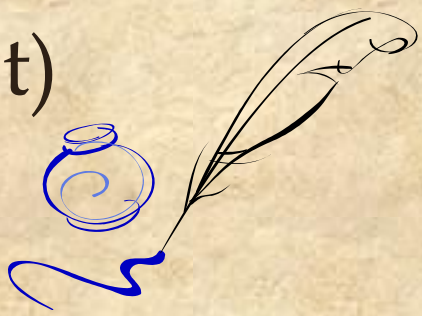
- The disadvantages may be (almost) necessary accompaniments.



References

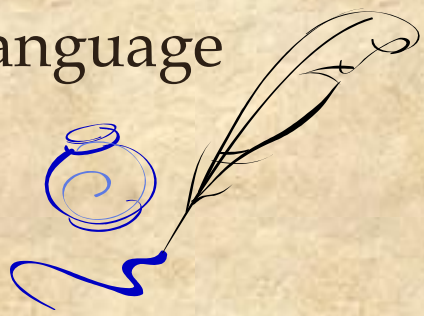
Daniels, Peter T. & William Bright, eds. 1996. *The World's Writing Systems*. New York: Oxford University Press.

Elliott, Christine. 2012. Second Language Writing System Word Recognition (with a focus on Lao). *Journal of the National Council of Less Commonly Taught Languages*. 53–73.

Gleitman, Lila R. & Paul Rozin. 1973. Teaching Reading by Use of a Syllabary. *Reading Research Quarterly* 8:4, 447-483.

Gnanadesikan, Amalia E. 2012. Maldivian Thaana, Japanese kana, and the representation of moras in writing. *Writing Systems Research* 4: 91–102.

Justeson, John S. & Laurence D. Stephens 1993. The evolution of syllabaries from alphabets: transmission, language contrast, and script typology. *Die Sprache* 35.1: 2–46.

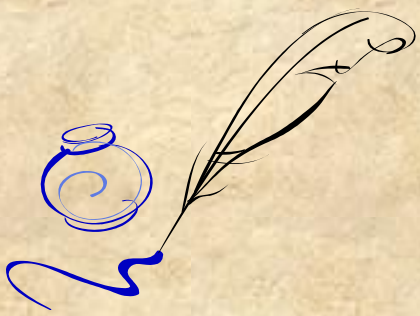


Kandhadai, Padmapriya, and Richard Sproat. 2010. Impact of spatial ordering of graphemes in alphasyllabic scripts on phonemic awareness in Indic languages. *Writing Systems Research* 2.2: 105–116.

Liberman, Isabelle Y, Donald Shanweiler, F. William Fischer & Bonnie Carter. 1974. Explicit syllable and phoneme segmentation in the young child. *Journal of Experimental Child Psychology* 18: 201-212.

Masica, Colin. 1991. *The Indo-Aryan Languages.* Cambridge: Cambridge University Press.

Nag, Sonali. 2014. Akshara-phonology mappings: The common yet uncommon case of the consonant cluster. *Writing Systems Research* 6: 105–119.



Salomon, Richard. 1995. On the Origin of the Early Indian Scripts. *Journal of the American Oriental Society* 115(2): 271–279.

Salomon, Richard. 1996. Brahmi and Kharoshthi. In Daniels & Bright (1996).

Salomon, Richard. 1998. *Indian Epigraphy: A Guide to the Study of inscriptions in Sanskrit, Prakrit, and the Other Indo-Aryan Languages*. Oxford: Oxford University Press.

Taylor, Insup & M. Martin Taylor. 1995. *Writing and Literacy in Chinese, Korean and Japanese*. Amsterdam: John Benjamins.

Windfuhr, Gernot (ed). 2009. *The Iranian Languages*. London: Routledge.