

Modern Linguistics in Ancient India

The ancient Indian linguistic tradition has been influential in the development of modern linguistics, yet is not well known among modern Western linguists. This unique book addresses this gap by providing an accessible introduction to the Indian linguistic tradition, covering its most important achievements and ideas, and assessing its impact on Western linguistics. It shows how ancient Indian methods of linguistic analysis can be applied to a number of topical issues across the disciplines of modern linguistics – spanning phonetics, phonology, morphology, syntax, semantics, and computational linguistics. Exploring the parallels, differences, and connections in how both traditions treat major issues in linguistic science, it sheds new light on a number of topical issues in linguistic theory. Synthesizing existing major work on both sides, it makes Indian linguistics accessible to Western linguists for the first time, as well as making ideas from mainstream linguistics more accessible to students and scholars of Indian grammar.

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Acknowledgements

Anupāsītavṛddhānām vidyā nātiprasīdati.

‘The goddess of science is not pleased with those who neglect the ancients.’

– Bhartṛhari, *Vākyapadīya* 2.490

Prajñā vivekaṃ labhate bhinnair āgamadarśanaiḥ

kiyaḍ vā śakyam unnetuṃ svatarkam anudhāvatā.

‘Clarity of understanding is obtained by studying diverse doctrines.

Or how far can one argue who learns only his own system?’

– Bhartṛhari, *Vākyapadīya* 2.489

The origins of this book lie in a series of lectures titled ‘Pāṇini and Modern Linguistics’, given in the Faculty of Linguistics, Philology and Phonetics at the University of Oxford in early 2018. My aim was to introduce Pāṇini and the Indian linguistic tradition to the students of the Linguistics Faculty and other interested parties, to draw out points of comparison and contrast, and to investigate points of influence between the traditions. I am very grateful to all those who attended that lecture series, and to others who were sufficiently intrigued to request, read, and even in some cases comment on, the original handouts.

My greatest academic debt of thanks, in relation to this book but also in relation to many other things, is to Jim Benson: everything I know about Pāṇini and the Indian linguistic tradition I either learned from Jim, double-checked with Jim, or (frequently) was originally mistaken about until gently yet precisely corrected by Jim. Without his teaching, his encouragement and guidance, this book would never have come to be.

For comments on the draft manuscript of this book I am very grateful to Frances Dowle, Davide Mocci, and (again) Jim Benson. Their breadth of perspective and detailed reading have significantly improved the final product. Of course, they bear no responsibility for any remaining errors and weaknesses.

More specific thanks are due to a number of people: to John Coleman, who first set me thinking about the issues discussed in Chapter 8, around fifteen years ago and who, much more recently, provided valuable insights and feedback on the material now presented in that chapter and also material presented

viii Acknowledgements

in Chapter 3. Much of Chapter 8 was published in slightly earlier form as Lowe (2020), and in relation to that paper I remain grateful to the editor of *Language*, Andries Coetzee, to Robert Port, and to two anonymous referees for their feedback. Similarly, parts of Chapter 6 were first published as Lowe (2021); I am grateful to Rishi Rajpopat and Martin Everaert for comments on that paper, and to Ghanshyam Sharma for our collaboration as editors on the volume in which that paper appeared.

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This book was conceived and begun prior to the start of the LINGUINDIC project (www.linguindic.com), but due to delays partly resulting from the Covid-19 pandemic has been completed during the course of the project and thus has benefited in certain ways from my work on that project. The LINGUINDIC project is funded by the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (Grant Agreement No. 851990).

Finally, I remain eternally grateful to and for my family, most importantly Helen, Henry, Freddie, and Rosie, for all their love and support.

Note on the Use of Sanskrit Words

In this book a large number of Sanskrit terms are used. These are italicized at their first occurrence in a chapter, where they are defined, and when used metalinguistically (see Chapter 7) to refer to the term itself or its form. Terms which have been introduced and are used in running text in their ordinary sense are not italicized.

Glossary

The following is a list of Sanskrit terms which are introduced in the text but not translated at every occurrence. All translations are approximate, and each word is explained in more detail at its first occurrence.

<i>abhinidhāna</i>	unreleased stop
<i>adhikāra</i>	heading rule
<i>aṅga</i>	stem, pre-suffixal base
<i>antaraṅga</i>	(word-)internal (of morphological operations)
<i>anubandha</i>	code letter
<i>anudātta</i>	low tone (accent)
<i>anunāsika</i>	nasalized
<i>anusvāra</i>	a type of nasal segment
<i>asiddha</i>	(treated as) not having taken effect
<i>artha</i>	meaning, referent
<i>ātmanepada</i>	mediopassive
<i>avagraha</i>	pause in recitation (or the corresponding graphical mark)
<i>bahuvrīhi</i>	a type of compound (\approx exocentric)
<i>bhāva</i>	the action/event denoted by a verb
<i>brāhmaṇa</i>	a type of text, the oldest stage of Vedic prose
<i>chandas</i>	metrical analysis; Vedas
<i>daṇḍa</i>	a punctuation mark (vertical line)
<i>dravya</i>	entity
<i>gaṇa</i>	group, list
<i>iṭ</i>	code letter (= <i>anubandha</i>)
<i>itikaraṇa</i>	the use of <i>iti</i> as a marker in <i>padapāṭha</i>
<i>kāraka</i>	argument structure role
<i>karmakarṭṭ</i>	a type of fientive construction
<i>karaṇa</i>	\approx instrument, a <i>kāraka</i>
<i>karman</i>	\approx logical object, a <i>kāraka</i>
<i>karṭṭ</i>	\approx agent, a <i>kāraka</i>
<i>kṛt</i>	a type of primary suffix

<i>kṛtya</i>	the gerundive suffixes
<i>lakāra</i>	the verbal <i>la</i> suffixes, marking tense
<i>lopa</i>	deletion, elision
<i>mantra</i>	a sentence or phrase used in a ritual
<i>mīmāṃsaka</i>	philosopher of the <i>Mīmāṃsā</i> school
<i>Mīmāṃsā</i>	a philosophical school
<i>naiyāyika</i>	philosopher of the <i>Nyāya</i> school
<i>ṇati</i>	retroflexion of <i>n</i>
<i>nirvacana</i>	a tradition of etymology/semantic analysis
<i>Nyāya</i>	a philosophical school
<i>pada</i>	word
<i>pāda</i>	verse quarter
<i>padapāṭha</i>	word-by-word recitation (or the text of this)
<i>parasmaipada</i>	active (diathesis)
<i>paribhāṣā</i>	metarule
<i>pratyāhāra</i>	an abbreviatory sequence marked with an <i>anubandha</i>
<i>śākhā</i>	Vedic school
<i>saṃhitā(pāṭha)</i>	continuous recitation; the main text of a Veda
<i>saṃjñā</i>	label, technical term
<i>sandhi</i>	phonological operation conditioned at a morpheme or word boundary
<i>siddha</i>	(treated as) having taken effect
<i>sphoṭa</i>	the abstract aspect of linguistic knowledge
<i>sūtra</i>	a short, concise rule or statement
<i>svarabhakti</i>	a short vowel segment inserted in some phonological contexts
<i>svarita</i>	falling tone (accent)
<i>taddhita</i>	secondary derivational suffix
<i>udātta</i>	high tone (accent)
<i>vākya</i>	sentence/utterance
<i>varṇa</i>	segment, phoneme
<i>Veda</i>	archaic sacred text
<i>vedāṅga</i>	subsidiary text tradition to the Vedas
<i>visarga</i>	the sound /h/ (written ḥ)
<i>visarjanīya</i>	(=visarga)
<i>vrddhi</i>	The vowels <i>ā</i> , <i>ai</i> , and <i>au</i>
<i>vyākaraṇa</i>	grammar

Abbreviations

AA	<i>Aitareya Āraṇyaka</i>
AB	<i>Aitareya Brāhmaṇa</i>
abl.	ablative
abs.	absolutive (=converb)
acc.	accusative
act.	active
Aṣṭ.	<i>Aṣṭādhyāyī</i>
cs.	causative
CxG	Construction Grammar
CU	<i>Chāndogya Upaniṣad</i>
dat.	dative
Dhp.	<i>Dhātupāṭha</i>
du.	dual
emph.	emphatic
fem.	feminine
gen.	genitive
HPSG	Head-driven Phrase Structure Grammar
IAST	International Alphabet of Sanskrit Transliteration
imp.	imperative
ins.	instrumental
IPA	International Phonetic Alphabet
LFG	Lexical-Functional Grammar
LMT	lexical mapping theory
loc.	locative
MBh.	<i>Mahābhāṣya</i>
OT	Optimality Theory
nom.	nominative
pass.	passive
pl.	plural
poss.	possessive
quot.	quotative

xii	List of Abbreviations
RV	<i>Ṛgveda</i>
SBCG	Sign-Based Construction Grammar
sg.	singular
SPE	<i>The Sound Pattern of English</i>
TA	<i>Taittirīya Āraṇyaka</i>
TP	<i>Taittirīya Prātiśākhya</i>
TS	<i>Taittirīya Saṃhitā</i>
voc.	vocative
VP	<i>Vākyapadīya</i>
VS	<i>Vājasaneyī Saṃhitā</i>
Vt.	<i>Vārttika</i>

Texts and Authors

The following tables list the ancient Indian texts and authors mentioned in this work, ordered in three ways: alphabetically by text, alphabetically by author, and by (approximate) date. Texts which are not directly named in this work are given in parentheses.

Alphabetically by text

Text	Author/attributed to	Date (approximate)
<i>Aitareya Āraṇyaka</i>	Mahidāsa	700–500 BC
<i>Aitareya Brāhmaṇa</i>	Mahidāsa	800–600 BC
<i>Aṣṭādhyāyī</i>	Pāṇini	500 BC
<i>Atharva Prātiśākhya</i>	Śaunaka	pre-500 BC (in origin)
(<i>Bṛhatī</i>)	Prabhākara	600–700 AD
<i>Chāndogya Upaniṣad</i>	various	700–500 BC
(<i>Gadā</i>)	Vaidyanātha	1700–1800 AD
<i>Kāśīkāvṛtti</i>	Vāmana & Jayāditya	600–700 AD
<i>Kātantra</i>	Śarvavarman	400 AD
<i>Kaumāralāta</i>	Kumāralāta	325 AD
<i>Laghumañjūṣā</i>	Nāgeśa(bhaṭṭa)	1700 AD
<i>Mahābhāṣya</i>	Patañjali	150 BC
(<i>Mīmāṃsāslokavārttika</i>)	Kumārila(bhaṭṭa)	600–700 AD
<i>Mīmāṃsāsūtrabhāṣya</i>	Śabara	100–1 BC
<i>Mugdhabodha</i>	Vopadeva	1300 AD
<i>Nañvāda</i>	Raghunātha	1500–1600 AD
<i>Nighaṇṭu</i>	unknown	pre-500 BC
<i>Nirukta</i>	Yāska	500 BC
<i>Nyāyasūtras</i>	Gautama	100–200 AD
(<i>Nyāyasūtrabhāṣya</i>)	Vātsyāyana	c. 400 AD

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Text	Author/attributed to	Date (approximate)
<i>Paribhāṣāpāṭha</i>	Puruṣottamadeva	1100–1200 AD
<i>Paribhāṣāvṛtti</i>	Nīlakaṇṭha(dīkṣita)	1700–1800 AD
<i>Paribhāṣenduśekhara</i>	Nāgeśa(bhaṭṭa)	1700 AD
<i>(Pradīpa)</i>	Kaiyaṭa	1000–1100 AD
<i>Prakīrṇaprakāśa</i>	Helārāja	1000 AD
<i>Pūrvamīmāṃsāsūtras</i>	Jaimini	300–200 BC
<i>Ṛgveda Padapāṭha</i>	Śākalya	900–700 BC
<i>Ṛgveda (Saṃhitā)</i>	various	1500–1200 BC
<i>Ṛk Prātiśākhya</i>	Śaunaka	pre-500 BC (in origin)
<i>Rūpavatāra</i>	Dharmakīrti	1100–1200 AD
<i>Śabdakalāpa</i>	Kāsakṛtsna	200–400 AD
<i>Samkṣiptasāra</i>	Kramadīśvara	1200–1300 AD
<i>Sārasvatavyākaraṇa</i>	Anubhūti	1250–1450 AD
	Svarūpācārya	
<i>Siddhahaimacandra</i>	Hemacandra Sūri	1100–1200 AD
<i>Siddhāntakaumudī</i>	Bhaṭṭoji(dīkṣita)	1600 AD
<i>Taittirīya Āraṇyaka</i>	unknown	800–700 BC
<i>Taittirīya Prātiśākhya</i>	unknown	pre-500 BC (in origin)
<i>Taittirīya Saṃhitā</i>	various	1200–1000 BC
<i>Tolkāppiyam</i>	(Tolkappiyar)	400–500 AD
unknown	Hrasva Māṇḍūkeya	700–500 BC
<i>Vaiyākaraṇabhūṣaṇa</i>	Kaundabhaṭṭa	1600–1700 AD
<i>Vājasaneyi Prātiśākhya</i>	Kātyāyana	pre-500 BC (in origin)
<i>Vājasaneyi Saṃhitā</i>	various	1200–1000 BC
<i>Vākyapadīya</i>	Bharṭṛhari	400–500 AD
<i>Vārttika</i>	Kātyāyana	300–200 BC
<i>Vṛtti</i>	?Bharṭṛhari	400–600 AD

Alphabetically by author

Text	Author/attributed to	Date (approximate)
<i>Sārasvatavyākaraṇa</i>	Anubhūti	1250–1450 AD
	Svarūpācārya	
<i>Vākyapadīya</i>	Bharṭṛhari	400–500 AD
<i>Vṛtti</i>	?Bharṭṛhari	400–600 AD
<i>Siddhāntakaumudī</i>	Bhaṭṭoji(dīkṣita)	1600 AD
<i>Rūpavatāra</i>	Dharmakīrti	1100–1200 AD
<i>Nyāyasūtras</i>	Gautama	100–200 AD
<i>Prakīrṇaprakāśa</i>	Helārāja	1000 AD

Text	Author/attributed to	Date (approximate)
<i>Siddhahaimacandra</i>	Hemacandra Sūri	1100–1200 AD
unknown	Hrasva Māṇḍūkeya	700–500 BC
<i>Pūrvamīmāṃsāsūtras</i>	Jaimini	300–200 BC
<i>Kāśikāvṛtti</i>	Jayāditya (& Vāmana)	600–700 AD
(<i>Pradīpa</i>)	Kaiyaṭa	1000–1100 AD
<i>Śabdakalāpa</i>	Kāsakṛtsna	200–400 AD
<i>Vājasaneyi Prātiśākhya</i>	Kātyāyana	pre-500 BC (in origin)
<i>Vārttikas</i>	Kātyāyana	300–200 BC
<i>Vaiyākaraṇabhūṣaṇa</i>	Kauṇḍabhaṭṭa	1600–1700 AD
<i>Samkṣiptasāra</i>	Kramadīśvara	1200–1300 AD
<i>Kaumāralāta</i>	Kumāralāta	325 AD
(<i>Mīmāṃsāslokaavārttika</i>)	Kumārila(bhaṭṭa)	600–700 AD
<i>Aitareya Āraṇyaka</i>	Mahidāsa	700–500 BC
<i>Aitareya Brāhmaṇa</i>	Mahidāsa	800–600 BC
<i>Laghumañjūṣā</i>	Nāgeśa(bhaṭṭa)	1700 AD
<i>Paribhāṣenduśekhara</i>	Nāgeśa(bhaṭṭa)	1700 AD
<i>Paribhāṣāvṛtti</i>	Nīlakaṇṭha(dīkṣita)	1700–1800 AD
<i>Aṣṭādhyāyī</i>	Pāṇini	500 BC
<i>Mahābhāṣya</i>	Patañjali	150 BC
(<i>Brhatī</i>)	Prabhākara	600–700 AD
<i>Paribhāṣāpāṭha</i>	Puruṣottamadeva	1100–1200 AD
<i>Nañvāda</i>	Raghunātha	1500–1600 AD
<i>Mīmāṃsāsūtrabhāṣya</i>	Śabara	100–1 BC
<i>Ṛgveda Padapāṭha</i>	Śākalya	900–700 BC
<i>Kātantra</i>	Śarvavarman	400 AD
<i>Atharva Prātiśākhya</i>	Śaunaka	pre-500 BC (in origin)
<i>Ṛk Prātiśākhya</i>	Śaunaka	pre-500 BC (in origin)
<i>Tolkappiyam</i>	(Tolkappiyar)	400–500 AD
<i>Nighaṇṭu</i>	unknown	pre-500 BC
<i>Taittirīya Āraṇyaka</i>	unknown	700–800 BC
<i>Taittirīya Prātiśākhya</i>	unknown	pre-500 BC (in origin)
(<i>Gadā</i>)	Vaidyanātha	1700–1800 AD
<i>Kāśikāvṛtti</i>	Vāmana (& Jayāditya)	600–700 AD
<i>Chāndogya Upaniṣad</i>	various	700–500 BC
<i>Ṛgveda (saṃhitā)</i>	various	1500–1200 BC
<i>Taittirīya Saṃhitā</i>	various	1200–1000 BC
<i>Vājasaneyi Saṃhitā</i>	various	1200–1000 BC
(<i>Nyāyasūtrabhāṣya</i>)	Vātsyāyana	c. 400 AD
<i>Mugdhabodha</i>	Vopadeva	1300 AD
<i>Nirukta</i>	Yāska	500 BC

xvi Texts and Authors

By (approximate) date

Text	Author/attributed to	Date (approximate)
<i>Ṛgveda (saṃhitā)</i>	various	1500–1200 BC
<i>Taittirīya Saṃhitā</i>	various	1200–1000 BC
<i>Vājasaneyi Saṃhitā</i>	various	1200–1000 BC
<i>Ṛgveda Padapāṭha</i>	Śākalya	900–700 BC
<i>Aitareya Brāhmaṇa</i>	Mahidāsa	800–600 BC
<i>Taittirīya Āraṇyaka</i>	unknown	800–700 BC
<i>Aitareya Āraṇyaka</i>	Mahidāsa	700–500 BC
<i>Chāndogya Upaniṣad</i>	various	700–500 BC
unknown	Hrasva Māṇḍūkeya	700–500 BC
<i>Nighaṇṭu</i>	unknown	pre-500 BC
<i>Atharva Prātiśākhya</i>	Śaunaka	pre-500 BC (in origin)
<i>Rk Prātiśākhya</i>	Śaunaka	pre-500 BC (in origin)
<i>Taittirīya Prātiśākhya</i>	unknown	pre-500 BC (in origin)
<i>Vājasaneyi Prātiśākhya</i>	Kātyāyana	pre-500 BC (in origin)
<i>Aṣṭādhyāyī</i>	Pāṇini	500 BC
<i>Nirukta</i>	Yāska	500 BC
<i>Pūrvamīmāṃsāsūtras</i>	Jaimini	300–200 BC
<i>Vārttikas</i>	Kātyāyana	300–200 BC
<i>Mahābhāṣya</i>	Patañjali	150 BC
<i>Mīmāṃsāsūtrabhāṣya</i>	Śabara	100–1 BC
<i>Nyāyasūtras</i>	Gautama	200–100 AD
<i>Śabdakalāpa</i>	Kāsakṛtsna	200–400 AD
<i>Kaumāralāta</i>	Kumāralāta	325 AD
<i>Kātantra</i>	Śarvavarman	400 AD
<i>(Nyāyasūtrabhāṣya)</i>	Vātsyāyana	c. 400 AD
<i>Tolkappiyam</i>	(Tolkappiyar)	400–500 AD
<i>Vākyapadīya</i>	Bhartrhari	400–500 AD
<i>Vṛtti</i>	?Bhartrhari	400–600 AD
<i>(Bṛhatī)</i>	Prabhākara	600–700 AD
<i>Kāśikāvṛtti</i>	Vāmana & Jayāditya	600–700 AD
<i>(Mīmāṃsāślokaavārttika)</i>	Kumārila(bhaṭṭa)	600–700 AD
<i>Prakīrṇaparakāśa</i>	Helārāja	1000 AD
<i>(Pradīpa)</i>	Kaiyaṭa	1000–1100 AD
<i>Paribhāṣapāṭha</i>	Puruṣottamadeva	1100–1200 AD
<i>Rūpavatāra</i>	Dharmakīrti	1100–1200 AD
<i>Siddhahaimacandra</i>	Hemacandra Sūri	1100–1200 AD
<i>Samkṣiptasāra</i>	Kramadīśvara	1200–1300 AD

Texts and Authors

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Text	Author/attributed to	Date (approximate)
<i>Sārasvatavyākaraṇa</i>	Anubhūti Svarūpācārya	1250–1450 AD
<i>Mugdhabodha</i>	Vopadeva	1300 AD
<i>Nañvāda</i>	Raghunātha	1500–1600 AD
<i>Siddhāntakaumudī</i>	Bhaṭṭoji(dīkṣita)	1600 AD
<i>Vaiyākaraṇabhūṣaṇa</i>	Kauṇḍabhaṭṭa	1600–1700 AD
<i>Laghumañjūṣā</i>	Nāgeśa(bhaṭṭa)	1700 AD
<i>Paribhāṣenduśekhara</i>	Nāgeśa(bhaṭṭa)	1700 AD
<i>Paribhāṣāvṛtti</i>	Nīlakaṇṭha(dīkṣita)	1700–1800 AD
(<i>Gadā</i>)	Vaidyanātha	1700–1800 AD

The Sanskrit Transcription System

In this work I present all Sanskrit words and text in the IAST transcription system. The transcription corresponds to IPA notation approximately as follows. Vowels are listed below, consonants appear on the following page.

Transcription	Phonetic value (approx)
<i>a</i>	[ə]
<i>ā</i>	[ɑ:]
<i>i</i>	[i]
<i>ī</i>	[i:]
<i>u</i>	[u]
<i>ū</i>	[u:]
<i>ṛ</i>	[ɾ]
<i>ṝ</i>	[ɾ:]
<i>ḷ</i>	[ɭ]
<i>e</i>	[e:]
<i>ai</i>	[ai]
<i>o</i>	[o:]
<i>au</i>	[au]

Vowels may be nasalized; this is indicated by an *anunāsika* ('nasalization') symbol *ṁ* following the vowel; for example, *aṁ* indicates nasalized *a*.

Regarding the consonants (on the following page), note that the bilabial series is usually called 'labial', the alveolar series 'dental', and the postalveolar series 'palatal'. The only regular Sanskrit sound not included here is the *anusvāra*, *ṁ*, which is best understood (following Cardona 2013a) as a postvocalic nasal segment with differing dialectal realizations; cf. §8.3.

<i>The consonantal system of Sanskrit</i>									
	Bilabial	Labiodent.	Alveolar/dent.	Postalv.	Retroflex	Palatal	Velar	Glottal	
Plosive unaspl.	p	b	t	d	ṭ	ḍ	k	g	
Plosive aspirated	ph	bh	th	dh	ṭh	ḍh	kh	gh	
Affricate				c	j				
Aff. aspirated				ch	jh				
Nasal		m		n	ṇ		ṅ		
Flap				r					
Fricative			v s	ś	ṣ			h	h
Approximant						y			
Lateral approx.				l					