

Pāṇini's grammar and its role in the history of linguistics

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Summary

- Dating and motivations
- Pāṇini's technique
 - *śivasūtra, lakāras, kāraka/vibhakti*
- Western “discovery” of Pāṇini's grammar
- Pāṇini's legacy in modern linguistics

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Dating and motivation

- *Aṣṭādhyāyī*, literally “Eight lessons”
 - ca. 4000 *sūtras* ‘aphorisms’
- Greatest grammatical/linguistic achievement of the antiquity
 - nothing similar in other indigenous grammars
 - some of Panini’s ideas understood by the West only in the 60s

Dating and motivation

- Commentators of the *Aṣṭādhyāyī*
 - *Kātyāyana* (III cent. B.C.): *varttika* ‘glosses’
 - *Patañjali* (II cent. B.C.): *bhāṣya* ‘explanations’
 - *Kātyāyana* + *Patañjali* = *Mahābhāṣya* ‘The Great Commentary’
 - Bhartr̥hari’s *Vākyapadīya* (VI cent. A.D.)
 - *Kāśikāvṛttī* (VII cent. A.D.): the “standard” commentary

Dating and motivation

- *Vyākaraṇa* ‘grammar’ (lit. ‘analysis’) is one of the six *vedāṅga* ‘auxiliary sciences of the Veda’

1. *śikṣā* ‘phonetics’

2. *chandas* ‘prosody’

3. *vyākaraṇa* ‘grammar’

4. *nirukta* ‘etymology’

5. *kalpa* ‘ritual’

6. *jyotiṣa* ‘astrology’

Dating and motivation

- Grammar serves the ritual
 - the prayers needed to be adapted to the situation
- Native grammars are created when the language is changing
 - from Sanskrit to Prakrit
 - similarly in all the other native traditions

Dating and motivation

- The real date of Pāṇini is problematic
 - proposed dates range from mythological times to VI, V, IV cent. B.C., and even later
- Vedic Sanskrit flourished around 1500–1000 B.C.
 - Buddhism (ca. VI cent. B.C.) uses Middle Indian (Pāli)
 - Sanskrit was already declining

Dating and motivation

- The earliest surviving commentary on Pāṇini:
Patañjali's *Mahābhāṣya*
- Patañjali mentions the king Puṣpamitra in one of the examples
 - this puts Patañjali in the II cent. B.C.
 - Therefore, Pāṇini's date is somewhere between Buddha and Patañjali

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Pāṇini's technique

- Pāṇini's grammar is a highly complex linguistic structure
 - his object-language is Sanskrit
 - including Vedic variants
 - his meta-language is an artificial “meta-Sanskrit”
 - he addresses speakers of some Middle Indian dialects

Pāṇini's technique

- Pāṇini's grammar covers mostly morphology
 - inflectional and derivational morphology
 - morpheme boundaries processing (sandhi)
 - morpheme alternations (allomorphy)
 - morphology/syntax interface (semantic roles)
- No phonology, no complex syntax

Pāṇini's technique

- Adhyāya I
 - basic definitions; metarules
- Adhyāya II
 - compounds; declension of nouns; zero morpheme
- Adhyāya III
 - primary suffixes; conjugation of verbs
- Adhyāya IV
 - more nominal forms; feminine suffix
- Adhyāya V–VII
 - reduplication; augment; pitch accent; sandhi
- Adhyāya VIII
 - more on sandhi and accent

Pāṇini's technique

- Pāṇini's most important discoveries
 - inflectional paradigm (lexeme as a set of inflected forms)
 - vowel gradation (change of the vowel within a root)
 - *sandhi* (morpheme boundaries processing)
 - morphological zero (deletion of a morpheme)
 - morphology is pure form, no semantics attached

Pāṇini's technique

- What's vowel gradation? (aka: apophony, ablaut)

	Present	Past	Participle	Noun
SING	<i>si<u>ng</u></i>	<i>sa<u>ng</u></i>	<i>su<u>ng</u></i>	<i>so<u>ng</u></i>
BIND	<i>bi<u>nd</u></i>	<i>bo<u>und</u></i>	<i>bo<u>und</u></i>	<i>bo<u>nd</u></i>
WRING	<i>wri<u>ng</u></i>	<i>wra<u>ng</u></i>	<i>wru<u>ng</u></i>	<i>wro<u>ng</u></i>

Pāṇini's technique

- What's a paradigm?

PAC 'to cook'

Active Indicative Present

its paradigm {

	Singular	Dual	Plural
1	<i>pacāmi</i>	<i>pacāvas</i>	<i>pacāmas</i>
2	<i>pacasi</i>	<i>pacathas</i>	<i>pacatha</i>
3	<i>pacati</i>	<i>pacatas</i>	<i>pacanti</i>

Pāṇini's technique

- What's a sandhi?
- Portuguese prefix *des*:
 - des-fazer
 - des-gosto
 - des-aparecer
- Portuguese spelling does not register sandhi

Pāṇini's technique

- Peculiarities of Pāṇini's metalanguage
 - algebraic style: abbreviations, variables
 - technical terminology
 - minimalism (no verbs)
 - case endings as grammatical instructions
 - *anuvṛtti* (rules presuppose other rules)

Pāṇini's technique

- Pāṇini's terminology
 - *anvarthasamjñā* 'self-explaining terms'
 - probably inherited from preceding sources
 - *anubandha* 'grammatical markers'
 - letters attached to the linguistic element
 - *pratyāhāra* 'abbreviations', linguistic elements + *anubandhas*

Pāṇini's technique

- Pāṇini's general approach
 1. read the request from semantics and choose the most appropriate means of expression
 2. take the needed morphemes from lists of roots and morphemes
 3. process the phonological form of the morphemes in order to accommodate the sandhi (assimilation of boundaries)

Pāṇini's technique

- General scheme of phonological processing:

$$A \rightarrow B / C_D$$

= substitute A with B after C and/or before D

- A, B, C, and D are marked with Gen, Nom, Abl, and Loc

$$A_{\text{Gen}} \rightarrow B_{\text{Nom}} / C_{\text{Abl}}_D_{\text{Loc}}$$

Pāṇini's technique

- Letters A, B, C, and D may correspond to:
 - single phonemes, groups of phonemes
 - single morphemes, groups of morphemes (roots, endings, etc)
 - grammatical values (singular, plural, present, past, etc)
 - accents
 - sometimes, semantic values (agent, location, coreference, etc)

Pāṇini's technique: Śivasūtra

Grouping of sounds (Śivasūtra)

- | | | |
|-------------------------|-----------------------------|---|
| 1. <i>a i u</i> Ṇ | 6. <i>la</i> Ṇ | 11. <i>kha pha cha ṭha tha ca ṭa ta</i> V |
| 2. <i>ṛ ḷ</i> K | 7. <i>ña ma ña ṇa na</i> M | 12. <i>ka pa</i> Y |
| 3. <i>e o</i> ṅ | 8. <i>jha bha</i> ñ | 13. <i>śa ṣa sa</i> R |
| 4. <i>ai au</i> C | 9. <i>gha ḍha dha</i> Ṣ | 14. <i>ha</i> L |
| 5. <i>ha ya va ra</i> Ṭ | 10. <i>ja ba ga ḍa da</i> Ś | |

Pāṇini's technique: Śivasūtra

- Not the usual Sanskrit alphabet
- Phonemes are grouped for the needs of morphology
 - phonemes within one group are not necessarily similar
- phoneme *h* appears twice (5 and 14)
- marker *Ṇ* appears twice (1 and 6)

Pāṇini's technique: Śivasūtra

- single phonemes are quoted with the marker *D*:
 - aD = 'the phoneme a ', $\bar{u}D$ = 'the phoneme \bar{u} ', etc.
- group of phonemes are quoted through the Śivasūtra
 - either from the first phoneme to the marker within a sūtra
 - or from the first needed phoneme to the last marker

Pāṇini's technique: Śivasūtra

- Aṣṭādhyāyī 1.1.1: *vṛddhir āDaiC*

$\bar{a}D = \bar{a}$, $aiC = \{ai, au\}$ belong to the *vṛddhi* 'lengthened grade'

- Aṣṭādhyāyī 1.1.2 *aDeṅ guṇaḥ*

$aD = a$, $eṅ = \{e, o\}$ belong to the *guṇa* 'normal grade'

- Aṣṭādhyāyī 1.1.3 *iko guṇavṛddhī*

guṇa and *vṛddhi* replace $ik = \{i, u, ṛ, ḷ\}$

Pāṇini's technique: Śivasūtra

- $haL = \{\text{all consonants}\}$
- $hal\text{-anta}$ 'ending with a haL ' = 'ending with a consonant'
- Hindi $halant$ 'the consonant diacritic' (also $virāma$)

क + , → क् [k]

Pāṇini's technique: *lakāras*

la-symbols for the tensed endings

LAṬ — present

LOṬ — imperative

LIT — perfect

LAN̄ — imperfect

LRṬ — future

LIN̄ — optative

LUT — future II

LUN̄ — aorist

LEṬ — subjunctive

LRN̄ — conditional

Pāṇini's technique: *lakāras*

	(primary endings) $-T̄$	(secondary endings) $-N̄$
(present stem) $LA-$	$LA\dot{T}$ = present	$LAN̄$ = imperfect
(perfect stem) $LI-$	$LI\dot{T}$ = perfect	$LIN̄$ = optative
(future stem) $LṚ-$	$LṚ\dot{T}$ = future	$LṚN̄$ = conditional
(aorist stem) $LU-$	$LUT̄$ = future II	$LUN̄$ = aorist
(subjunctive) $LE-$	$LE\dot{T}$ = subjunctive	
(imperative) $LO-$	$LO\dot{T}$ = imperative	

Pāṇini's technique: *kāra*ka/*vibhakti*

- Pāṇini opposes *kāra*ka ‘semantic roles’ to *vibhakti* ‘case-values’
 - Verb arguments have semantic roles
 - Nominal cases are just forms (no inherent semantics)
- Fillmore (1968) reached the same conclusion
 - traditional Latin case-names attempt to “depict” semantics

Pāṇini's technique: *kāraṅka/vibhakti*

- There are 6 *kāraṅkas*

apādāna 'origin'

kaṛaṅa 'instrument'

sampradāna 'receiver'

karman 'undergoer'

adhikaraṅa 'location'

karṭṛ 'agent' (≈subject)

Pāṇini's technique: *kāra*ka/*vibhakti*

- There are 7 *vibhaktis*, named by ordinal numbers

prathamā = 1st, nominative

pañcamī = 5th, ablative

dvitīyā = 2nd, accusative

ṣaṣṭī = 6th, genitive

ṭṛtīyā = 3rd, instrumental

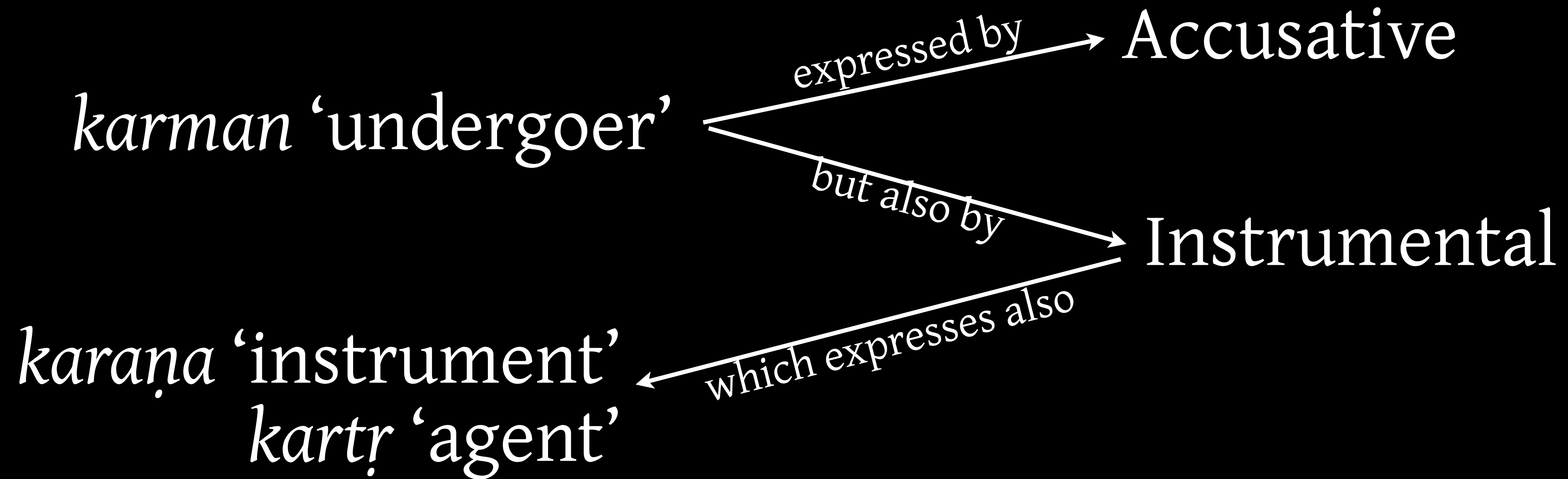
saptamī = 7th, locative

caturthī = 4th, dative

Pāṇini's technique: *kāra*ka/*vibhakti*

- Each *kāra*ka can be expressed by multiple *vibhaktis*
 - and also by other means
- Each *vibhakti* may express more than one *kāra*ka
- There is no one-to-one relation between *kāra*kas and *vibhaktis*
 - Peculiarity: nominative does not express any *kāra*ka!

Pāṇini's technique: *kāraṅka/vibhakti*



<i>kāraṅka</i>	sūtra	Explanation	<i>vibhakti/s</i>
<i>karṭṛ</i>	P 1.4.54	One which is independent (the most important source) in any action and executes the action	P 2.3.46 → <i>prathamā</i>
			P 2.3.18 → <i>tr̥tīyā</i>
			P 2.3.65 → <i>ṣaṣṭhī</i>
<i>karman</i>	P 1.4.49	which is most desired of agent through his action	P 2.3.2 → <i>dvitīyā</i>
			P 3.4.69 → <i>prathamā</i>
			P 2.3.12 → <i>caturthī</i>
			P 2.3.65 → <i>ṣaṣṭhī</i>
<i>karāṇa</i>	P 1.4.42	that which is most instrumental in accomplishment of an action	P 2.3.18 → <i>tr̥tīyā</i>
			P 1.4.43 → <i>dvitīyā</i>
<i>sampradāna</i>	P 1.4.32	whosoever the agent approaches for the object of the act of giving/benefit	P 2.3.13 → <i>caturthī</i>
			P 2.3.12 → <i>dvitīyā</i>
			P 1.4.44 → <i>tr̥tīyā</i>
<i>apādāna</i>	P 1.4.24	that from which/where separation/departure is meant	P 2.3.28 → <i>pañcamī</i>
			P 2.3.35 → <i>tr̥tīyā</i>
			P 2.3.32 → <i>dvitīyā</i>
<i>adhikarāṇa</i>	P 1.4.45	that which is the locus/ substratum of the action	P 2.3.36 → <i>saptamī</i>
			P 2.3.38 → <i>ṣaṣṭhī</i>
			P 2.3.42 → <i>pañcamī</i>
			P 2.3.44 → <i>tr̥tīyā</i>

Pāṇini's technique: *kāraṅka/vibhakti*

- Example of an active sentence:

Rāma	in the pot	the rice	cooks
<i>Rām-aḥ</i>	<i>sthāl-yām</i>	<i>odan-am</i>	<i>paca-ti</i>
Nom	Loc	Acc	3SgAct
↑	↑	↑	↑
∅	<i>adhikaraṇa</i> 'location'	<i>karman</i> 'object'	<i>kartr</i> 'agent'

Pāṇini's technique: *kāraḥ/vibhakti*

- Example of a passive sentence:

by Rāma	in the pot	the rice	is cooked
<i>Rām-ena</i>	<i>sthāl-yām</i>	<i>odan-aḥ</i>	<i>pacya-te</i>
Instr	Loc	Nom	3SgMid
↑	↑	↑	↑
<i>karṭṛ</i>	<i>adhikaraṇa</i>	∅	<i>karman</i>
'agent'	'location'		'object'

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Western “discovery” of Pāṇini

- William Johns, discovers Sanskrit (1786)
- H. Th. Colebrooke, first grammar of Sanskrit (1804)
- Franz Bopp, the founder of historical linguistics (1816)
- Otto von Böhtlingk, first edition of Panini’s grammar (1839–1840)

Western “discovery” of Pāṇini

- Some criticism from the western scholars
 - Sanskrit is too complex to be a real language
 - criticism of the sandhi rules
 - Panini’s grammar is excessively complex and confusing
 - criticism of the *kāraka/vibhakti* theory

Western “discovery” of Pāṇini

W. D. Whitney: «Pāṇini does not take up the cases as forms of nouns, setting forth the various uses of each, after our manner; he adopts the **vastly more difficult and dangerous method** of establishing a theoretical list of modes of verb-modification by case, or of ideal case-relations (he calls them *kāraka*, ‘factor’ or ‘adjunct’), to which he then distributes the cases. [...] however, his case-relations or *kāraka* are [...] simply a reflection of the case-forms; **they are of the same number as the latter**, and each corresponds to the general sphere of a case: they are *karṭṛ* (‘actor’ = nominative), *karman* (‘act’ = accusative), *sampradāna* (‘delivery’ = dative), *karaṇa* (‘instrument’ = instrumental), *adhikaraṇa* (‘sphere’ = locative), and *apādāna* (‘removal’ = ablative)».

Western “discovery” of Pāṇini

- **R. G. Bhandarkar:** «Then the Sandhi or euphonic combinations of letters which are necessary in Sanskrit, are regarded as inconsistent with the character of a spoken language. [...] But the euphonic combination of consonants in the same word is necessary even in Latin; as in *rex = reg-s*, *scriptus = scrib-tus*, *cinctum = cing-tum*, *lectum = leg-tum* [...].»

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Pāṇini's legacy

- What does Pāṇini's grammatical tradition teach us?
- Almost everything
 - in phonetics
 - in morphology
 - in how the grammar is organized

Pāṇini's legacy

- Articulatory **phonetics**
- Pāṇini does not deal with phonetics, but see *śikṣā*
 - Indian knowledge of the articulatory apparatus was almost as perfect as today
 - Studying Sanskrit forced the learners to understand the articulation

Pāṇini's legacy

- Pāṇini's approach to morphology introduced the notions of **root**, paradigm, stem, verbal class, word-form vs. lexeme, morphological zero, etc
- This made possible the birth of the **comparative method** (see F. Bopp)

Pāṇini's legacy

- The Indo-European hypothesis is based on the comparison of roots
 - if we don't know what roots are, we would have lost many cognates
 - Lat. *proptervus* 'arrogant' vs. Skt. *apaptat* 's/he fell'
 - Greek *pynthanetai* 's/he learns' vs. Skt. *bodhati* 's/he is awake'

Pāṇini's legacy

- Pāṇini's architecture of the grammar
 - complex combination of elementary rules
- Inspired some branches of modern phonology
 - Kiparsky's approach to phonological rules