

Pāṇini

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Pāṇini

- The Sanskrit grammarian Pāṇini lived in (approximately) the 6th Century BCE in the area around (approximately) India and Pakistan, is generally seen as one of the greatest linguists in the history.
- We know very little of his life — as is clear already from the uncertainties just mentioned —, not even whether he could really read and write.
- His grammatical description of Sanskrit, the *Aṣṭādhyāyī* was a system of 4,000 ordered phonological, morphological and syntactic rules, which probably initially served a prescriptive function
- These rules are extremely concise; the grammar is very difficult to read

Pāṇini revisited

- In the 19th Century, Pāṇini was discovered in Western linguistics, in particular by Franz Bopp; the first edition in a Western language (German) was by Otto von Böthlingk (1887)
- He has since then been cited quite widely as an amazing example of early linguistics; as a matter of fact, many scholars would agree that nobody has ever accomplished a complete formal grammar of any language like Pāṇini did for Sanskrit
- Some famous (Western) Pāṇini scholars: Frits Staal and Paul Kiparsky; the latter is also an active linguist, and this class will be mostly based on his exegesis of Pāṇini's grammar.

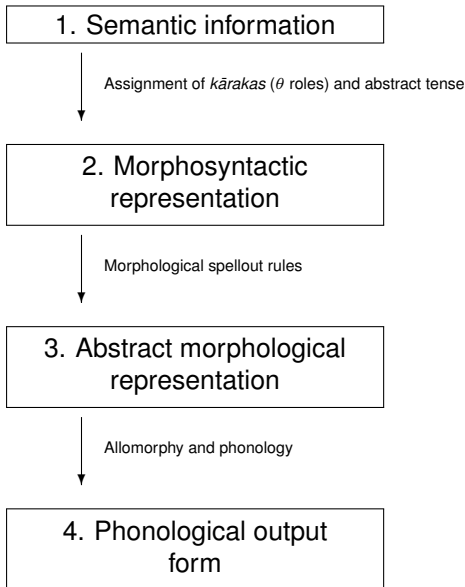
Four components of grammar

- *Aṣṭādhyāyī*: the grammatical rules
- *Śivasūtras*: the phoneme inventory (with some internal structure)
- *Dātupāṭa*: list of 2000 verbal roots (with some internal structure)
- *Gaṇapāṭha*: a list of 261 lists of lexical items (the subdivision refers to different sensitivities to grammatical rules)

Aṣṭādhyāyī

- According to the linguist and Pāṇini scholar Paul Kiparsky the formal richness of *Aṣṭādhyāyī* can be brought down to one governing principle: *lāghava* ('simplicity', 'economy').

Structure of the grammar



A sample derivation: semantics

1. The participant which is independent bears the role of agent (*kartr̥*).
2. When there is a separation, the participant which is fixed bears the source role (*apādāna*).
3. The participant which is primary target of the action bears the goal/patient role (*karman*). Roots denoting recent past events (events which have occurred previously on the present day) are assigned Aorist tense (*luñ*).
4. The suffix *Ktvā* is assigned (instead of aorist tense) to express to the root denoting the prior event if it has the same agent as the posterior event.

A sample derivation: morphosyntax

1. Morphosyntactic representation:

a. Sentence I.

- (1) *vána* 'forest': source (*apādāna*)
- (2) *grāma* 'village': goal (*karman*)
- (3) *adyá* 'today': temporal location (*adhikaraṇa, kāle*)
- (4) *āśvapaá* 'descendant of *Aśvapato*': agent (*karṭṛ*)
- (5) *upa-ā-iṅ+Ktvā* 'approach, reach': absolutive

b. Sentence II.

- (1) *odaná* 'rice': goal (*karman*)
- (2) *āśvapaá* 'descendant of *Aśvapato*': agent (*karṭṛ*)
- (3) *ḌUpacAṢ+luñ* 'cook': aorist tense

A sample derivation: morphology

1. *Abstract morphological representation:*

vána-ÑasI grāma-am adyá upa-ā iṅ-Ktvā odaná-sU

ásva-páti-aṅ-Tā á-dDUpacAṢ=Ciṅ-ta

forestABL_{SG} village-ACC_{SG} today PREP-PREP-go-ABS

rice-NOM_{SG} A.-descendant-INSTR_{SG} AUG-cook-AORPASS-3_{SG}

A sample derivation: phonology

1. *Phonological output:*

vánād gr'āmam adyópeyaudaná āśvapatén 'āpāci 'When Āśvapata came from the forest to the village today, he cooked some rice'. (*literally:*) 'Having come..., rice was cooked by A.'

Directionality of derivation

1. Derivation goes strictly from semantics to phonology, not the other way around.
2. “An example of the ‘top-down’ kind of rule which does not occur would be: ‘The agent of a gerundive is assigned genitive case if it bears initial accent.’”

The mapping from morphology to phonology...

... differs fundamentally from the others. It is the only one which allows destructive (non-monotonic) operations such as substitution and deletion. Both morphological elements and phonological segments may be replaced by other morphological elements or segments, or by zero. (The decision to treat allomorphy as replacement was a fateful one, as we shall see.) These processes create extensive opacity, i.e. application of rules in non-surface-true contexts, which forces use of a Pāṇinian counterpart to extrinsic ordering. In contrast, the mappings between the other levels are strictly monotonic. For example, there are no processes which delete káras or abstract tenses, or which replace one káras or abstract tense by another. In this system, it is really true that “phonology is different”

Parallels between Pāṇini and modern grammarians

- Phonology is different (non-monotonic)
- Cyclicity / strict cyclicity
- Etc.

What explains such parallels?

- Modern grammarians have been influenced by older authors
- The older authors are read with our current preoccupations in mind
- Older and modern authors have reached the same conclusion, for instance because it is the Truth, or something obvious to the human mind

Principles of rule ordering

1. if A follows B in the text of the *Aṣṭādhyāyī* (A is *para*; extrinsic ordering)
2. if application of A is independent of application of B (but not vice versa; A is *nitya*)
3. if A intern geconditioneerd is voor B (A is *antarañya*; Pāṇinian cyclicity)
4. if the set of inputs for A is a (proper) subset of the set of inputs of B (A is *apavāda*)

Nitya

- hujhalbhyo her dhiḥ (101 aṅgasya)
‘after (the root) *hu* and after a base ending in an obstruent, *-hi* is replaced by *-dhi*’
- rudādibhyaḥ sārvadhātuke (35 iṭ valādeḥ)
‘after the roots *rud* etc., the augment *iṭ* is inserted before *sārvadhātuka* endings beginning with a *vaL* consonant

Wrong rule application

- $*/(\text{rud}+\text{hi}/\rightarrow/\text{rud}+\text{dhi}/\rightarrow[\text{rud}+\text{i}+\text{dhi}])$

Correct rule application

- /rud+hi/→[rudi+hi]

apavāda = blocking

- $N \rightarrow N+a\dot{N}$ ‘zoon, nakomeling van N’
- $Upagu + a\dot{N} \rightarrow Aupagavá$ ‘nakomeling van Upagu’

Simplicity of the rule system

With the other patronymic suffixes, -aṅ constitutes a subclass of taddhita suffixes ('secondary' denominal derivational suffixes), which share a number of properties: they are added to nominal stems (prātipadikas), and they are optional, in the sense that there is a synonymous analytic expression [. . .]. Taddhita suffixes in turn are a subclass of suffixes (pratyaya), which share some more general properties, such as being placed after the base, and being accented (in the default case). Finally, suffixation is a subtype of word-formation, and all such processes share the property of applying only to semantically related elements [. . .]. Such shared properties are not repeated for each suffixation rule; they are stated just once in a heading with the appropriate scope.

Blocked application of patronymic suffix

- dityaditiādityapatyuttarapadāṅ ṅyaḥ (82 samarthānām ...) ...
 'The *taddhita* suffix *-ṅya* is added after the first syntactically related stems *Diti* ... and after compounds in *-pati*'

More complex *apavāda*

- *Gliding*: i, u, ṛ, ḷ → y, v, r, l before a vowel in close contact
- *Monophthongisation*: short or long /a/ and a vowel are together replaced by [a, e, o] in close contact
- *Contraction*: ' /a, i, u, ṛ, ḷ/ and a following vowel of the same colour are together replaced by a long vowel in close contact

Application of these rules

- adya iha apāci odanaḥ → adyehāpācyodanaḥ ‘the rice was cooked here today’

Word integrity

- a+yaj+a+i indra-am → ayaja indram ‘I sacrificed to India’
- atra i+ij+atuḥ → atrejatuh ‘he sacrificed her’

Thematic roles

- Crucial in Pāṇini's understanding of syntax is the concept of the thematic role (*kāraḱas*): Agent (*karṭṛ*), Goal (*karman*), Recipient (*saṃpradāna*), Instrument (*karāṇa*), Locative (*adhikarāṇa*), and Source (*apādāna*).
- Syntax is strictly monotonic: no deletion, no movement

Passive formation

- $kr̥ṣṇa-ḥ\ pac-a-ti\ odan-am$
 Krishna-Nom cook-3Sg rice-Acc
 'Krishna cooks rice'
- $kr̥ṣṇ-ena\ pac-ya-te\ odana-ḥ$
 Krishna-Ins cook-Pass-3Sg rice-Nom
 'Rice is cooked by Krishna'

Passive formation

- Instrumental case expresses the Agent and Instrument roles.
- Accusative case expresses the Goal/Patient role.
- Active verb endings express the Agent role.
- Passive verb endings express the Goal/Patient role if the verb has one, otherwise the Process.
- Nominalizing suffixes express the Agent (e.g. -aka), the Goal/Patient (e.g. the Passive Participle), or the Process (e.g. -ti).