

Aspect shifts in Indo-Aryan

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Grammaticalization paths

- ▶ Large-scale typological studies have produced a number of empirical generalizations about shifts in the meaning of tense-aspect categories.
 - ▶ The categories involved in these shifts are stable across cross-linguistic instantiations.
 - ▶ The paths of change are unidirectional.
 - ▶ These shifts are characterized as uniformly generalizing.
- (1) a. RESULTATIVE \gg PERFECT \gg PERFECTIVE
b. PROGRESSIVE \gg PRESENT/IMPERFECTIVE

Grammaticalization paths

- ▶ But what is the semantic content of these categories at each synchronic stage?
- ▶ How can the shifts be characterized as generalizations?
- ▶ What might be the motivations for such shifts?

Grammaticalization paths

- ▶ these questions may be better addressed with
 - ▶ detailed diachronic case studies
 - ▶ of individual forms
 - ▶ of broader tense-aspect systems within which such forms are embedded.
 - ▶ a characterization of the meaning of the categories that are the input to or the output of grammaticalization processes

This talk

- ▶ focus on the instantiation of the
RESULTATIVE ≫ PERFECT ≫ PERFECTIVE
path in Indo-Aryan as realized by *-ta*.
- ▶ provide evidence that *-ta* realizes three distinct aspectual categories at three stages in the history of Indo-Aryan
 - ▶ **Stage I:** *-ta* realizes the resultative perfect aspect
 - ▶ **Stage II:** *-ta* realizes the perfect aspect, with resultative, existential, and universal readings
 - ▶ **Stage III:** *-ta* realizes a complex aspectual category with both perfect and perfective uses
- ▶ Except for Jamison (1990), this change is not recognized in the vast literature in Indo-Aryan

This talk

- ▶ characterize the meaning of *-ta* at these three stages
- ▶ demonstrate the semantic relatedness of the three categories
- ▶ explore the enabling factors for the change.

A brief reminder on the perfect and perfective readings

- | | |
|---|-------------|
| (2) John has put the cake in the oven.
<i>The cake is in the oven.</i> | RESULTATIVE |
| (3) John has visited Korea many times.
<i>Many separate visits to Korea preceding now</i> | EXISTENTIAL |
| (4) John has lived in Korea for the last three years.
<i>Continuous living in Korea extending to now</i> | UNIVERSAL |
| (5) John iced the cake. He then went shopping. | PERFECTIVE |
| (6) *John has iced the cake. He has then gone shopping. | |

Indo-Aryan Chronology

TIMELINE	STAGE	LANGUAGE	SOURCE
1700BCE-1200BCE	I	Early Vedic	R̥gveda (RV)
1000BCE-500BCE	II	Later Vedic	Baudhāyana Sūtra (BS) Atharvaveda (AV)
300 BCE-700CE	III	Middle Indic	Vasudevahim̐ḍi (VH)

The expansion in the readings of *-ta*

READINGS	Resultative Stage I	Perfect Stage II	Perfective Stage III
Resultative perfect	✓	✓	✓
Existential perfect		✓	✓
Universal perfect		✓	✓
Eventive/Past			✓

Optionality of tense auxiliaries

- ▶ Present and past tense auxiliaries are optional with the *-ta* form in all three stages.
- ▶ *-ta* sentences without tense auxiliaries are interpreted identically to those with overt tense auxiliaries.
- ▶ The examples to come have no tense auxiliaries.

Early Vedic: Stage I

Distribution *-ta* appears as a prenominal modifier and as a main clausal predicate. This holds constant across all stages.

Readings Uniformly exhibits the resultative perfect reading. The result state may hold in the present or the past.

Alternative forms The existential and universal perfect are expressed by the reduplicated perfect form.

Early Vedic: Stage I

- ▶ Resultative perfect (Reference time is present)

(7) agnībhṛājas-o vidyút-o gābhastiy-oḥ śíprā-ḥ
fire.glowing-NOM.PL lightning-NOM.PL hand-LOC.DU visor-NOM.PL
śīrṣá-su **víta-tā** hiranyáyī-ḥ
head-LOC.PL spread-PERF.M.PL golden-NOM.PL
'Lightenings glowing with fire are on your hands; visors wrought
of gold have spread on your heads.' (RV. 5.54.11c-d)
Visors wrought of gold are on your heads

Early Vedic: Stage I

- ▶ Resultative perfect (Reference time is past)

(8) yad ayā-tam divodās-āya varti-ḥ... revád
when come-IMPF.2.DU D-DAT.SG abode-ACC.SG riches.ACC.SG
uvāh-a sacan-ó ráth-o vām vṛṣabhá-ś
carry-PFCT.3.SG good-M.PL chariot-NOM.SG you.GEN.DU bull-NOM.M.SG
ca śimśumāra-ś ca **yuk-tā**
and dolphin-NOM.M.SG and yoke-PERF.M.PL
'When you (Aśvins) *came* to Divodāsa, (to his) abode, your
chariot *had carried* rich goods. A bull and a river dolphin had
been yoked to it.' (RV 1:116:18)
A bull and a dolphin had a yoke around their heads

Evidence for resultative status of *-ta*

- ▶ A striking asymmetry between telic and atelic verbs with respect to attestation of *-ta* forms (list of roots and their attested verb forms in Grassman 1964 and Whitney 1883).

VERBS	TELIC			ATELIC
	BARE	PREVERBED	TOTAL	
Number of roots	44	10	54	38
PERF attested for	33	10	43	4
% PERF forming roots	75%	100%	80 %	10.5%

Evidence for resultative status of *-ta*

- ▶ Unavailability of existential perfect or eventive readings with *-ta* forms of frequently attested telic verbs.

verb	-ta form	Count	Existential reading
<i>su</i> ‘press out’	<i>sut</i>	58	0
<i>yuj</i> ‘yoke’	<i>yukt</i>	46	0
<i>idh</i> ‘kindle’	<i>iddh</i>	30	0
<i>badh</i> ‘bind’	<i>baddh</i>	15	0
<i>gr̥bh</i> ‘grasp’	<i>gr̥bhīt</i>	15	0
<i>vi+tan</i> ‘spread’	<i>vitat</i>	15	0

Evidence for resultative status of *-ta*

- ▶ No attestations of the *-ta* form with past-referring adverbials like *purā* and *pūrvam*, or frequency adverbials like *purudhā* ‘often’.
- ▶ The only examples of such adverbials occur in the part of the text known to be authored much later than the original text.

Adverbial	Occurrence	-ta modifier
<i>purā</i> ‘of old, earlier’	45	1
<i>pūrvam</i> ‘before, in the past’	8	1
<i>purudhā</i> ‘often’	9	1

Late Vedic: Stage II

- ▶ The *-ta* form further extends to atelic predicates.
- ▶ In addition to the resultative reading, it shows the existential and the universal perfect readings, characteristic readings of the perfect.

Late Vedic: Stage II

► Resultative perfect

(9)

yé-bhiḥ páṣ-aiḥ párivit-to víbad-dhó
which-INS.PL fetter-INS.PL elder.brother-NOM.M.SG bind-PERF.M.SG
'ṅgeaṅga árp-ita úts-itaś ca
limb-by-limb encumber-PERF.M.SG shackle-PERF.M.SG and

‘By which fetters the older brother (whose younger brother has married before him), has been bound, (with which) he has been encumbered and shackled limb by limb...’ (AV 6.112.3)

Late Vedic: Stage II

- ▶ Existential perfect (reference time is present)

(10)

nirṇodaḥ sarva.pāpānām pavitram ṛṣibhiḥ
banishment-NOM.M.SG all.sin-GEN.M.SG filter-NOM.N.SG sage-INS.M.PL
smṛtam
taught-PERF.N.SG

‘A filter (for) banishment of all sins has been taught by sages.’
(BS 3.6.5.1)

Late Vedic: Stage II

- ▶ Existential perfect (reference time is past)

(11)

trīṣ tvā devā ajanayannīṣṭhi-tam bhūmy-ām
thrice you.ACC.SG god-NOM.PL beget-IMPF.3.PL grow-PERF.N.SG
ādhi
earth-LOC.SG upon

Thrice, the Gods begot you; (you) had grown up upon this earth.
(AV. 19.34.6)

Late Vedic: Stage II

► Universal perfect

- (12) loka.saṁgrahaṇa.artha-m̐ hi tad amantrā-ḥ
world.adultery.purpose-ACC.M.SG PRT then non-mantra-NOM.F.PL
striy-**oma-tāḥ**
women-NOM.F.PL think-PERF.F.PL

It is due to their adulterous nature that women have been thought un-entitled to knowledge of the Vedas. (BS 1.5.11.7)

Middle Indic: Stage III

- ▶ The perfect readings are retained
- ▶ The *-ta* forms can also be used in narrative discourse and with definite past referring adverbials
- ▶ The reduplicated perfect and the aorist are lost.

Middle Indic: Stage III

► Existential perfect

- (14) tubbhe-him mamā-o vi airitta-.m dukkha-m
you-INS.SG I-ABL even more-NOM.N.SG sorrow-NOM.N.SG
pa-ttam
receive-PERF.N.SG
'Have you received (experienced) even more sorrow than me?'
(VH:DH.35.25)

Middle Indic: Stage III

► Universal perfect

- (15) kim manne devī passa-māṇī
why think-IMPF.1.SG lady.NOM.SG looking-PART.NOM.SG
nicchalcchī **thi-yā**
unmoving-eyes.NOM.SG stand-PERF.F.SG
Why, I wonder, has the watching lady, been standing with an
unmoving gaze? (VH:KH.9.7)

Middle Indic: Stage III

► Use in narrative discourse

- (16) a. tato te mitta-bāndhava-sahi-ā... **ga-yā**
then they.NOM.PL friends-relatives-with-NOM.PL go-PERF.M.PL
Then they went there with their friends and relatives.
- b. chagal-o vi ya maṇḍe-um tatth-eva **ni-o**
goat-NOM.M.SG also and decorate-INF there-EMPH take-PERF.M.SG
And the goat also was taken there to be decorated.

Middle Indic: Stage III

- c. gandha-puppha-malla-puyāvīsesena ya **acchi-yā**
sandal-paste-flowers-worship-ingredients and worship-PERF.M.PL
devayā
god-NOM.M.PL
The Gods were worshipped with sandalwood paste, flowers, the ingredients of worship.
- d. ghara-mahattara-ehi ya **bhaṇi-yam** chagala-o
house-elders-INS.PL and say-PERF.N.SG goat-NOM.SG
āṇi-jja-u
bring-PASS-IMP.3.SG
And the house elders said: Let the goat be brought.
- e. tato tassa putt-o... chagalay-am āṇe-uṃ **ga-to**
then his son-NOM.M/SG goat-ACC.SG bring-INF go-PERF.M.SG
At that, his son... went to bring the goat. (VH:D 29.25-28)

Middle Indic: Stage III

- Occurrence with definite past-referring adverbials

(17) **tato kaiva-esu divas-esu aikkan-t-esu... diṭ-thā** me
then many-LOC.PL day-LOC.PL
taruṇajuvati
pass-PERF-LOC.PL see-PERF.F.SG I-INS young.woman.NOM.SG
'Then, upon the passing of many days, I saw the young woman.'

(18) **tamm-i ya sama-e... so mahis-o ṇ-eṇa kiṇe-uṇa**
that-LOC.SG and time-LOC.SG that buffalo-NOM.M.SG
mār-io
he-INS.SG buy-GER kill-PERF.M.SG
'And, at that time, having bought that buffalo he *killed* it.'
(VH:KH 14:21)

The expansion in the readings of *-ta*

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Eventive/Past			✓

Basic Assumptions

- ▶ Sentence radicals are either basic eventive or stative predicates, or four-place relations relating events, event types, state types and states
- ▶ Aspectual operators apply to them to yield predicates of times within which the properties denoted by sentence radicals are instantiated
- ▶ In the absence of tense, a contextually determined reference time is given as an argument to the temporal abstract
- ▶ The time of utterance is always available as a potential reference time

Basic Assumptions

- ▶ Let \mathcal{E} be a domain of eventualities and \mathcal{T} a domain of non-null temporal intervals (with points as a special case) partially ordered by the relation of temporal precedence \prec and by the subinterval relation \sqsubseteq .
- ▶ A function τ from \mathcal{E} to \mathcal{T} gives the time span of an eventuality.
- ▶ **Instantiation**

$$\text{INST}(P, t) = \begin{cases} \exists e \in \mathcal{E} [P(e) \wedge \tau(e) \subseteq t] & \text{if } P \subseteq \mathcal{E} \\ P(t) & \text{if } P \subseteq \mathcal{T} \end{cases}$$

Resultative Perfect

- ▶ Following Piñón (1999) and von Stechow (2003), we take predications involving result states to involve relations with a stative predicate as one of their arguments.
- ▶ The resultative perfect maps a four-place relation denoted by sentence radicals to the times at which the stative predicate that is an argument of the relation holds.
- ▶ $\llbracket -ta_{Vedic} \rrbracket = \text{RESPERF}$

$$(19) \text{RESPERF} = \lambda R \lambda i \exists e \exists P \exists Q \exists s [R(e, P, Q, s) \wedge i = \tau(s)]$$

Resultative Perfect

$$(20) \text{ RESPERF} = \lambda R \lambda i \exists e \exists P \exists Q \exists s [R(e, P, Q, s) \wedge i = \tau(s)]$$

- ▶ The reference time r , specified by tense or contextually, has to be one of the elements of $\text{RESPERF}(R)$
- ▶ $r \in \text{RESPERF}(R)$ iff $r \in Q[i]$, where $Q[i]$ is the temporal correlate of Q :

$$(21) \quad \begin{aligned} Q[i] &= \lambda i \exists s [Q(s) \wedge i = \tau(s)] \\ P[i] &= \lambda i \exists e [P(e) \wedge i = \tau(e)] \end{aligned}$$

Entailment of Resultative Perfect

- ▶ For any four-place relation R with eventive argument P and stative argument Q it holds that
 - ▶ for every $i \in \text{RESPERF}(R)$ there is an interval j of which i is a final subinterval such that it contains an event e of the type P which does not overlap i

$$(22) \quad \lambda i \exists e \exists s [R(e, P, Q, s) \wedge i = \tau(s)] \subseteq \lambda i \exists j \text{NFINST}(P, j, i)$$

$$(23) \quad \text{NFINST}(P, j, i) \text{ is defined only if } i \text{ is a final subinterval of } j \\ \text{NFINST}(P, j, i) = \exists k [\text{INST}(P, k) \wedge k \sqsubseteq j \wedge \neg(i \circ k)] \text{ if defined}$$

From Resultative Perfect to Perfect

- ▶ The entailment of the resultative perfect gets conventionalized as the meaning of the perfect morphology *ta* in Late Vedic
- ▶ $\llbracket ta_{LVedic} \rrbracket = \text{PERF}$
- ▶ Unlike $\llbracket ta_{Vedic} \rrbracket$, $\llbracket ta_{LVedic} \rrbracket$ can apply to basic eventive and stative predicates as well as temporal predicates

(24)
$$\text{PERF} = \lambda P \lambda i \exists j [i \sqsubseteq_{\text{final}} j \wedge \text{NFINST}(P, j, i)]$$

- ▶ This is, in effect, the ‘extended now’ analysis of the perfect (McCoard 1978, Dowty 1979, Iatridou et al. 2001 among others)

Existential readings

- ▶ Supposing P is a basic eventive predicate and the reference time is the time of utterance

(25)

$$(\text{PERF}(P))(\text{Now}) = \exists j \exists k \exists e [P(e) \wedge \neg(\text{Now} \circ k) \wedge \tau(e) \sqsubseteq k \wedge \text{Now} \sqsubseteq_{\text{final}} j]$$

- ▶ For a class of predicates P , such as basic eventive predicates
 - ▶ for every element t of P or its temporal correlate there is a subset $\text{Sub}_t(\text{PERF}(P))$ of $\text{PERF}(P)$ such that for every $t' \in \text{Sub}_t(\text{PERF}(P))$, $t \prec t'$
- ▶ For such predicates $\text{PERF}(P)$ will only yield the existential reading, involving backshifting from the reference time

Universal readings

- ▶ For another class of predicates P , such as basic statives
 - ▶ $\text{PERF}(P)$ is a superset of P or its temporal correlate
- ▶ For such predicates
 - ▶ $\text{PERF}(P)$ will yield the existential reading if it is assumed that the reference time r is in $\text{PERF}(P)$ but not in P itself
 - ▶ $\text{PERF}(P)$ will yield the .universal reading if it is assumed that the reference time r is also in P

Resultative readings

- ▶ Although PERF cannot apply directly to sentence radicals denoting relations R of the type seen earlier, it can apply to $\text{RESPERF}(R)$
- ▶ $\text{PERF}(\text{RESPERF}(R)) = \text{PERF}(Q)$
- ▶ $Q[i] \setminus \text{glb}(Q[i]) \subset \text{PERF}(Q)$

From Perfect to Perfective

- ▶ In the transition from Late Vedic to Middle-Indic the condition for non-final instantiation is generalized to instantiation

- ▶ $\llbracket -ta_{MI} \rrbracket = \text{PERV}$

$$(26) \text{PERV} = \lambda P \lambda i \exists j [i \sqsubseteq_{final} j \wedge \text{INST}(P, j)]$$

- ▶ PERV subsumes the readings of PERF and in addition allows for instantiation within the reference time

This talk

- ▶ characterize the meaning of *-ta* at these three stages
- ▶ demonstrate the semantic relatedness of the three categories
- ▶ explore the enabling factors for the change

Motivations for the shift

- ▶ The relatedness of the resultative, the perfect, and the perfective semantic categories explains the naturalness of the shift.
 - ▶ *A necessary factor for the shift*
- ▶ What motivates the actual instantiation of this shift in the case of *-ta*?
 - ▶ *The enabling factor for the shift*

Motivations for the shift

- ▶ The larger tense-aspect system of Stage 1:
 - ▶ The reduplicated perfect form realizes the perfect: resultative, existential, and universal readings.
 - ▶ The aorist form exhibits the eventive past reading.
 - ▶ The *-ta* form realizes only the resultative perfect.
- ▶ The larger tense-aspect system of Stage 2:
 - ▶ The reduplicated perfect expands to show eventive past readings (overlapping with the aorist form) (Avery 1875; Whitney 1892).
 - ▶ The *-ta* form exhibits resultative, existential, and universal readings.
- ▶ The larger tense-aspect system of Stage 3:
 - ▶ The reduplicated perfect and the aorist are entirely lost.
 - ▶ The *-ta* form exhibits resultative, existential, and universal and eventive past readings

Motivations for the shift: A drag chain

- ▶ The semantic generalization of *-ta* appears to go hand-in-hand with the loss of the reduplicated perfect and the aorist.
- ▶ The loss of semantically general forms can be the enabling factor or trigger for the expansion in the meaning of a specific form.

Conclusion

- ▶ An explanation for the cross-linguistic resultative to perfect to perfective shift:
 - ▶ A nested semantic content for each category
 - ▶ Semantic generalization
- ▶ A potential motivation for the instantiation of such a shift
 - ▶ The loss of existing morphology for marking general semantic content