*ABA Generalizes to Monotonicity: An argument from verbal stem syncretism

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Overview

- *ABA constraint on verbal stems (Bobaljik 2012)
  - Discussed within a 3-cell paradigm (PST, PRTCP, PRS)

AAB: did – dide – bin

- Extended to a 4-cell paradigm (PST, PRTCP, PRS, FUT)
  - The linear order renders ABA patterns

AABA: did – dide – bin – did

- Proposal: Use a partial hierarchy of tense morphology
  - The attested patterns over this partial order are monotonic (Graf 2018)
  - It is motivated by Reichenbach's tense system (1947)

Outline

Constraint on ABA Patterns

Present	Participle	Past	Pattern
spreche	ge-sproch-en	sprach	ABC
gieß-e	gegossen	goß	ABB
gebe	gegeben	gab	AAB
walk	walked	walked	AAA
shine	shone	shone	ABB
come	come	came	AAB
sing	sung	sang	ABC

***ABA (Bobaljik 2012)**

Given a fixed order of arrangement, Present–Participle–Past, two cells cannot be syncretic to the exclusion of any cells between them.

Why *ABA?

- Feature-based Argument
  - Containment Hypothesis (Bobaljik 2012)

PRESENT	[ ]	POSITIVE	[ADJ]
PARTICIPLE	[PAST]	COMPARATIVE	[[ADJ] COMP]
PAST	[[PAST] FINITE]	SUPERLATIVE	[[[ADJ] COMP] SUP]

Two predictions of the containment hypothesis:

1. PRESENT and PAST are never syncretic to the exclusion of PARTICIPLE
2. All tenses can be linearly ordered so that no ABA patterns ever arise.

The Locus of the Future Stem in a Linear Order

Serbo-Croatian

Past	Participle	Present	**Future**	Pattern
hteo	hteo	hoću	hteću	AABA

French

Past	Participle	**Future**	Present	Pattern
all	all	Øir	all	AABA

Japanese

Past	**Future**	Participle	Present	Pattern
shita	suru	shiteita	suru	ABAB

English

Future	Past	Participle	Present	Pattern
go	went	gone	go	ABAA

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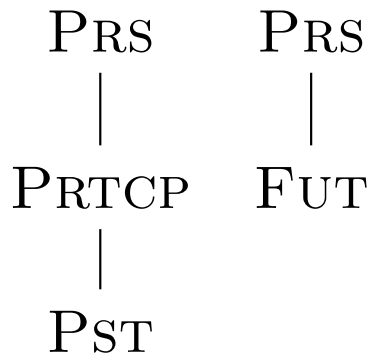
Containment Hypothesis

- **Possible treatments of the data**:
- 2 hierarchies of tense:
  PRESENT–PARTICIPLE–PAST
  and PRESENT–FUTURE



- A single hierarchy where **Future** is fluid
- **Problem**: It does not offer an explanation of why tense behaves the way it does.

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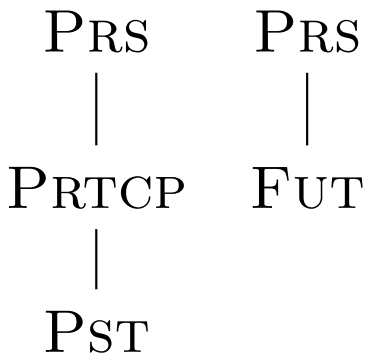

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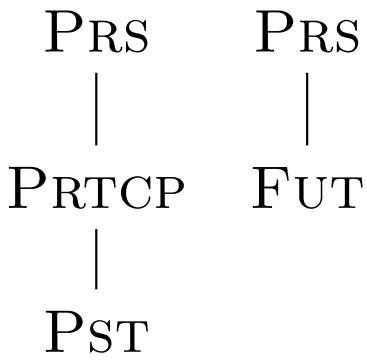


- **Problem**: It does not offer an explanation of why tense behaves the way it does.

Why *ABA?

- Cell-based Argument
  - Monotonic functions over partial hierarchies (Graf 2018)

Proposal

Allow a partial order, and the ABA patterns can be accounted for in terms of Graf's (2018) monotonicity constraint.

Data

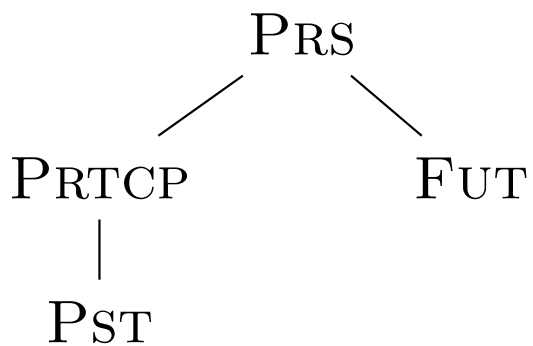
The Observed Patterns

- Typologically diverse opportunity-sample including 23 languages
- Altaic, Germanic, Indo-Iranian, Romance, Semitic and Slavic

Pattern	Lang.	Past	Participle	Present	Future
(1) AAAA	*Turkish*:	**gel**di	**gel**miș	**gel**iyor	**gel**eçek
(2) AAAB	*French*:	**all**	**all**	**all**	Øir
(3) AABB	*Japanese*:	**shit**a	**shit**eita	**suru**	**suru**
(4) ABCC	*Kurdish*:	**xwar**d	**xor**ia	**xwei**d	**xwei**d
(5) AABA	*Serb-Crt.*:	**hte**o	**hte**o	**hoć**u	**hteć**u
(6) ABCB	*Spanish*:	**fu**	Øi	**v**	Øir
(7) ABCD	*German*:	**warf**	ge**worf**en	**wirf**	**werf**en
(8) ABBB	*English*:	**went**	**go**ne	**go**	**go**
(9) AABC	*Sindhi*:	**wa**yo	**wa**yo	**wan**ye	**wi:n**do
(10) ABBC	*French*:	**vin**	**ven**	**ven**	**vien**dr

Verbal Stem Hierarchy

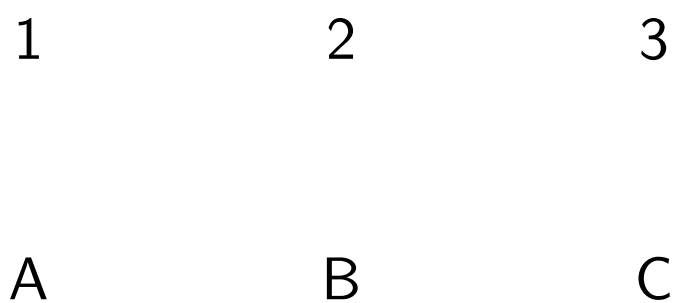
- Out of 15 logically possible patterns, only 5 are unattested:
  - Syncretism of Past and Present to the exclusion of Participle (ABA*X*)
  - Syncretism of Future and Past to the exclusion of Participle (ABCA, ABBA)



Monotonicity

Illustration

- Monotonicity is a mathematical property that corresponds to the linguistic notion of order preservation.
  - Example: No Crossing Branches constraint in autosegmental phonology (Goldsmith 1976)



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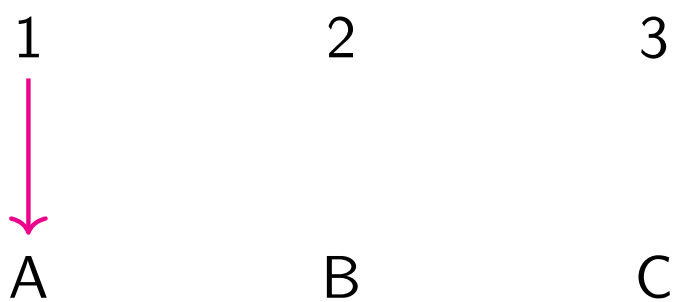

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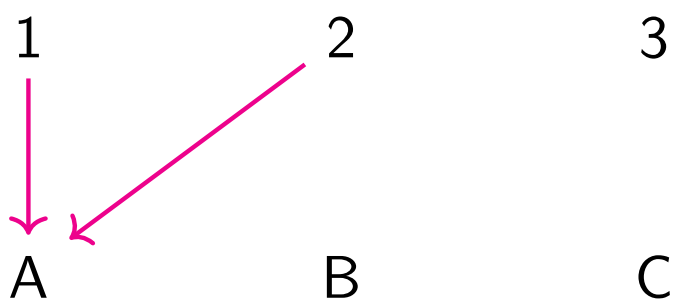

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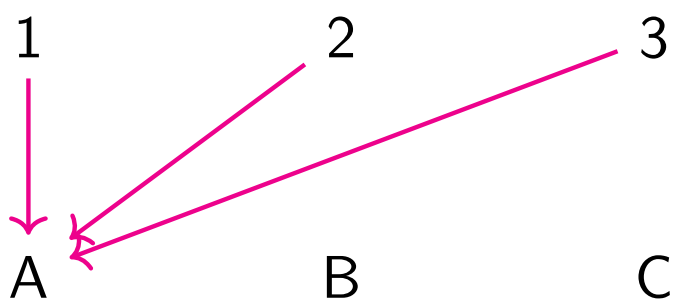

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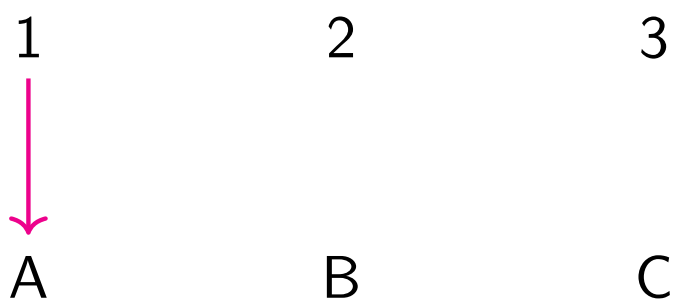

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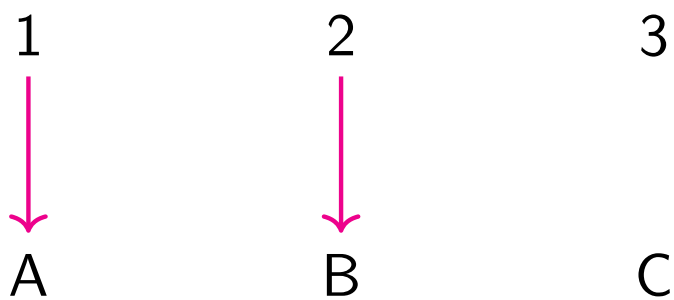

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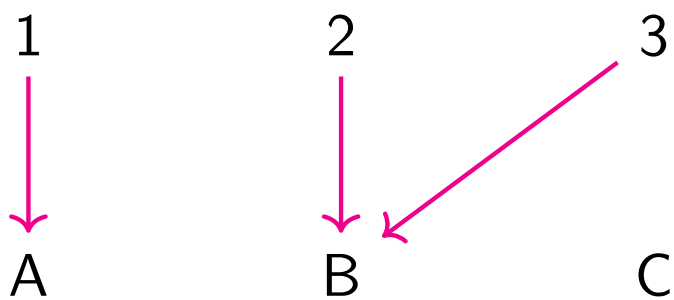

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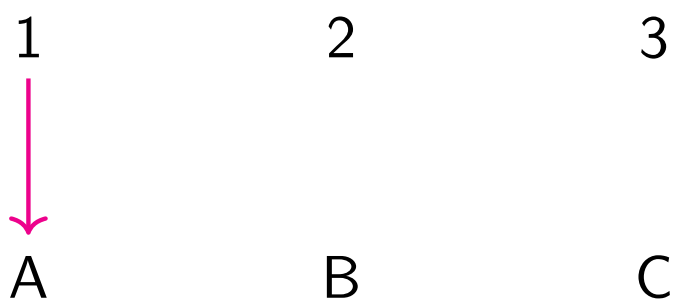

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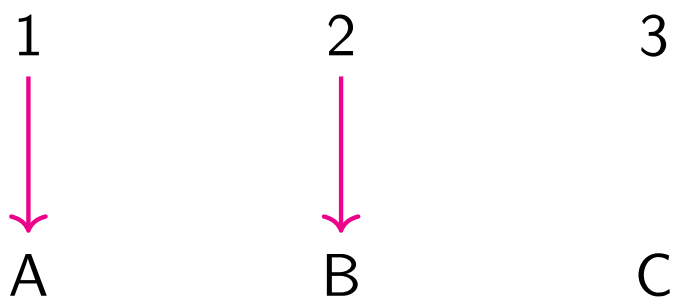

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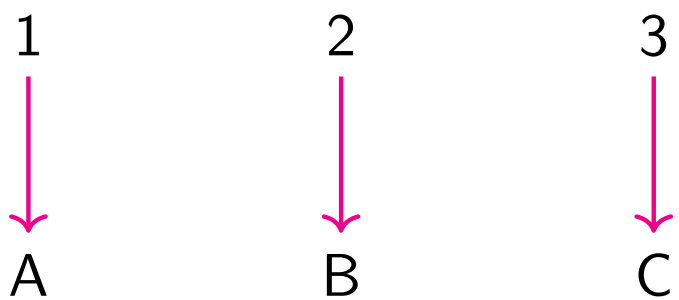

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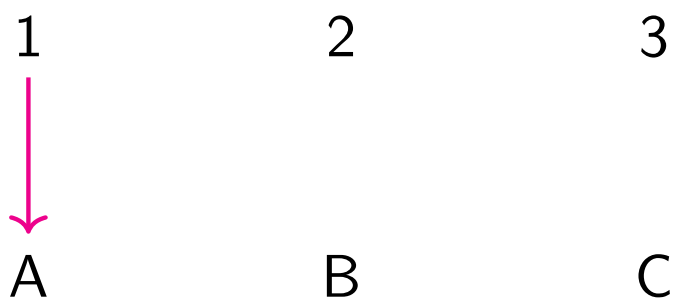

Pattern: ABA

- If $\leq$ is a linear order, monotonicity corresponds exactly to the *ABA generalization.
- But monotonicity is more general: it can also be defined over partial orders.

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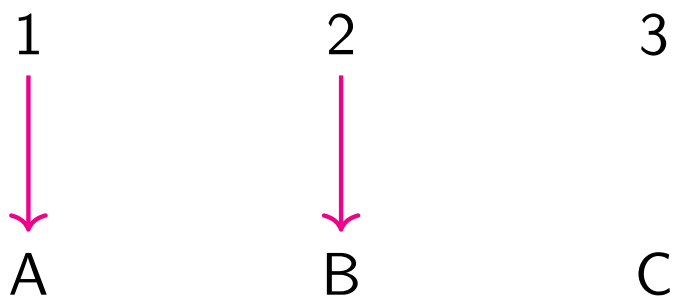

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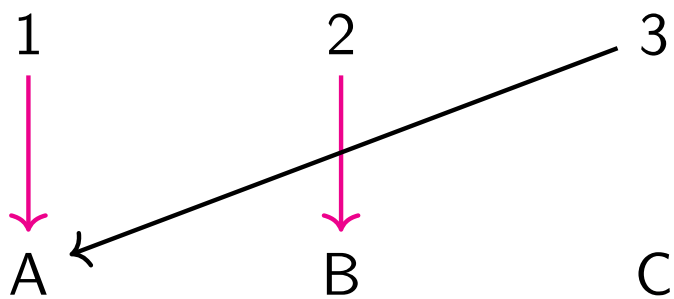

Pattern: ABA

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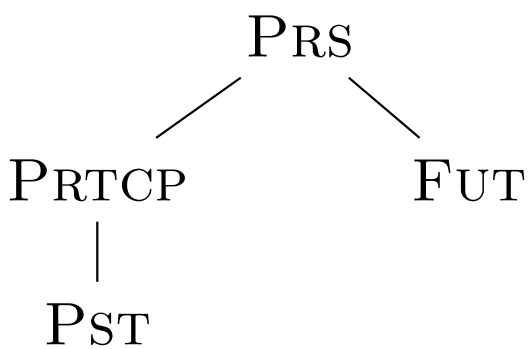
- But monotonicity is more general: it can also be defined over partial orders.

Monotonicity

Partial Hierarchy

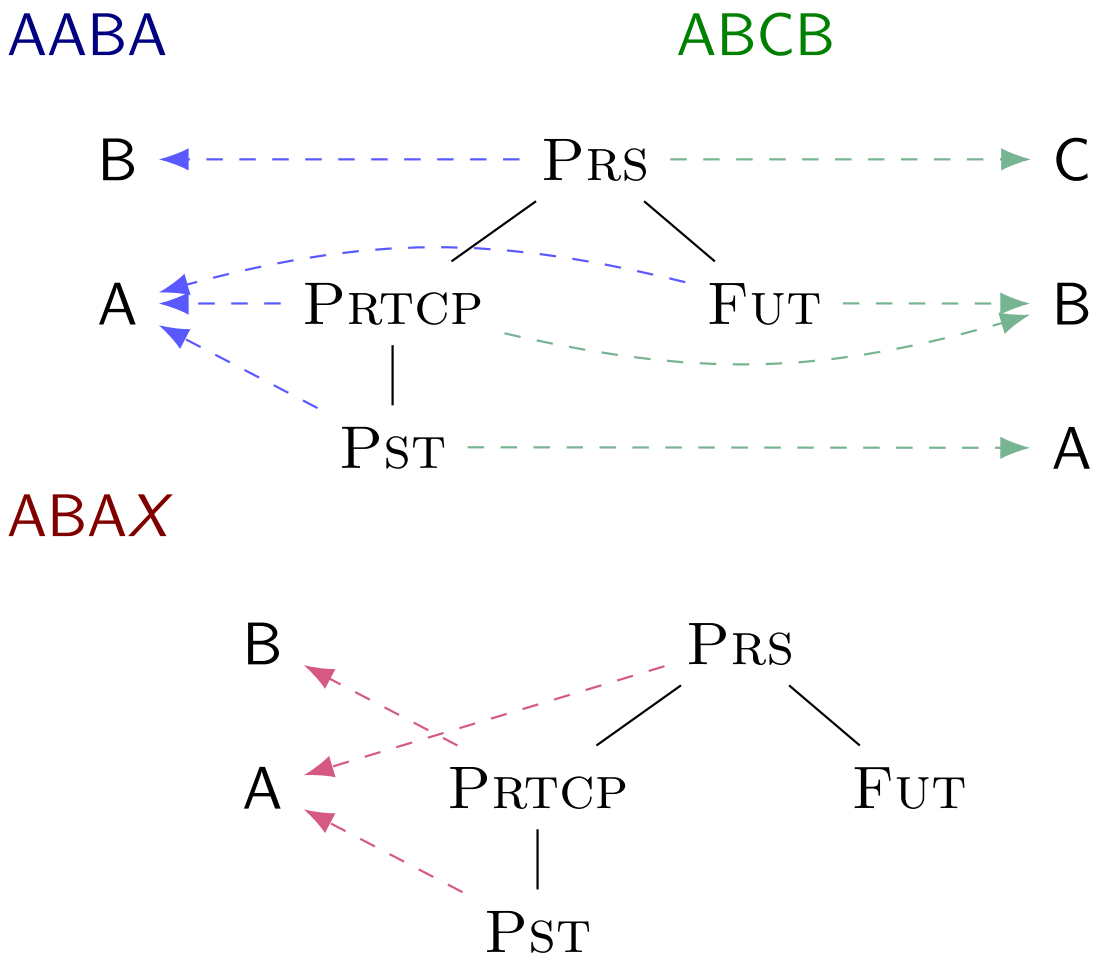
- Suppose a partial order where:
  - Present $\leq$ Participle $\leq$ Past, and
  - Present $\leq$ Future, but
  - Future is unordered with respect to Participle and Past.
- Then Future can be syncretic with any one of the three tenses to the exclusion of others, allowing for a limited range of ABA patterns.



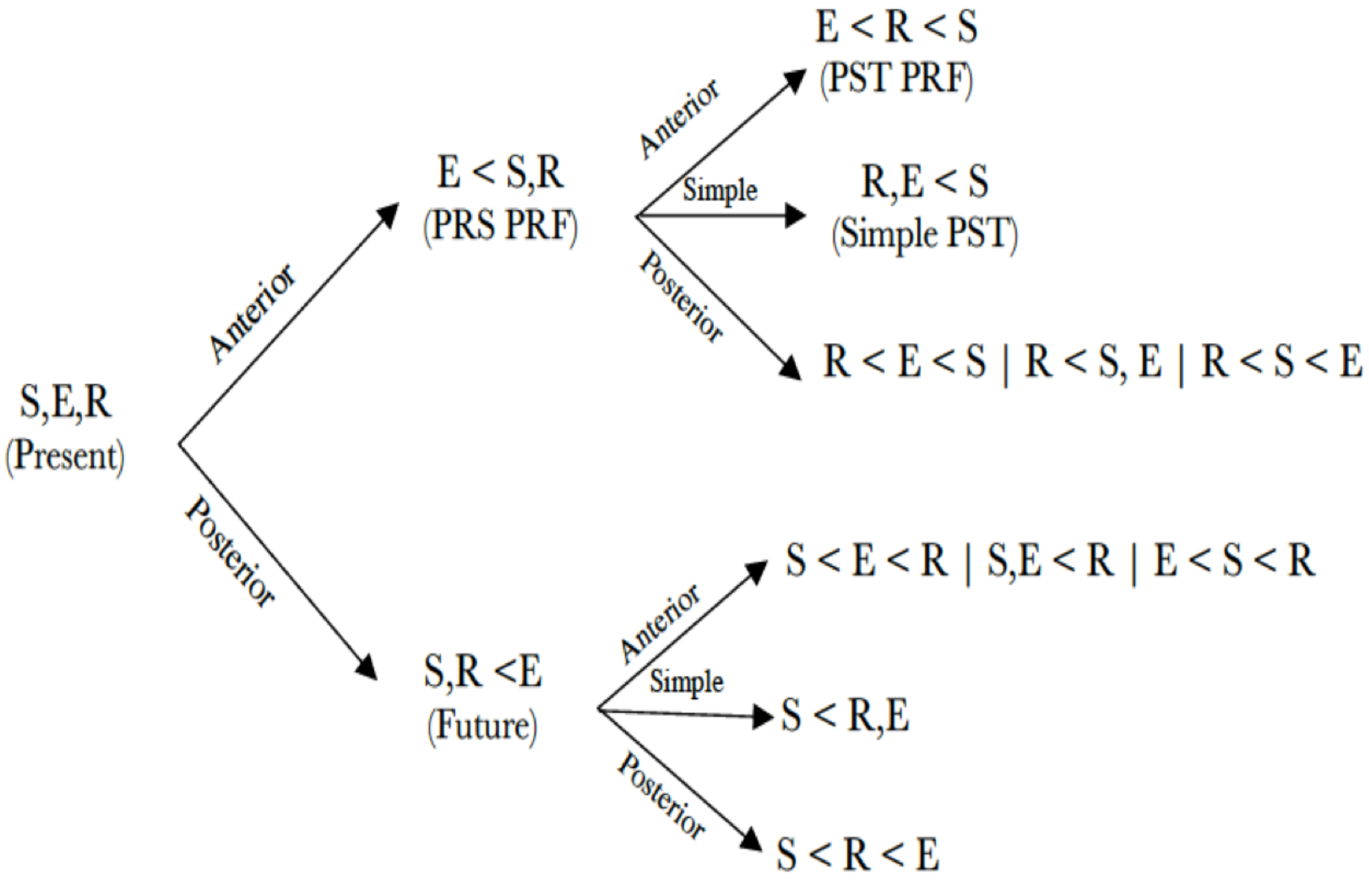
Monotonicity

Partial Hierarchy

Changing PAST ≤ PARTICIPLE ≤ PRESENT ≤ FUTURE into:



Semantic Motivation: Reichenbach (1947)



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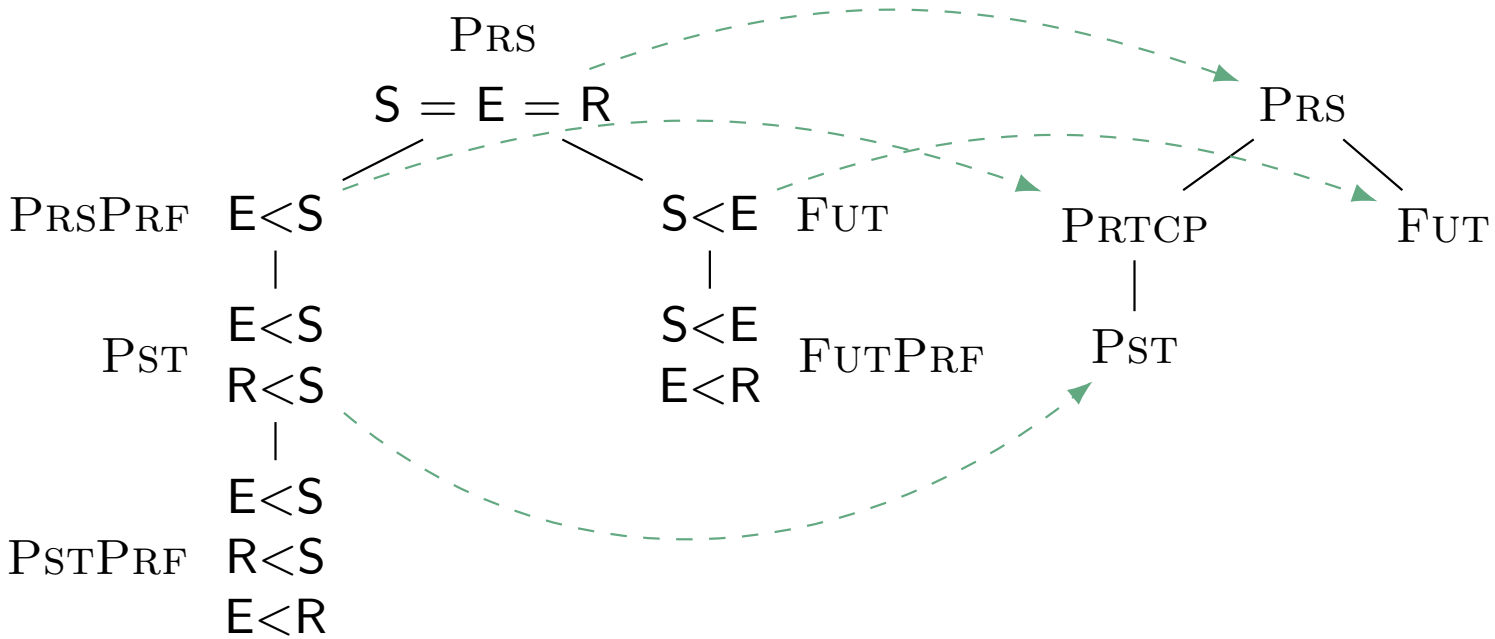


Semantic Motivation

The Locus of Participle

Three reasons for identifying Participle with **Present Perfect**:

1. Present perfect is the default perfect

"Present refers to the default situation from which other tenses represent deviations." Bybee et al. (1994:152)

"The semantics of the past perfect and the future perfect follow from the semantics of the present perfect combined with an account of the past tense and the future tense." (Musan 2001: 356)

Semantic Motivation

The Locus of Participle

Three reasons for identifying Participle with **Present Perfect**:

1. Present perfect is the default perfect
2. The present perfect is the most frequent perfect construction. (Bowie and Aarts 2012: the Diachronic Corpus of Present-day Spoken English (DCPSE): 1970s to 1990s)

Semantic Motivation

The Locus of Participle

Three reasons for identifying Participle with **Present Perfect**:

1. Present perfect is the default perfect
2. The present perfect is the most frequent perfect construction (Bowie and Aarts 2012).
3. The hierarchy of tense is an implicational hierarchy.

If a language has a past perfect or a future perfect, we expect that it also has a present perfect (but not the reverse).

Conclusion

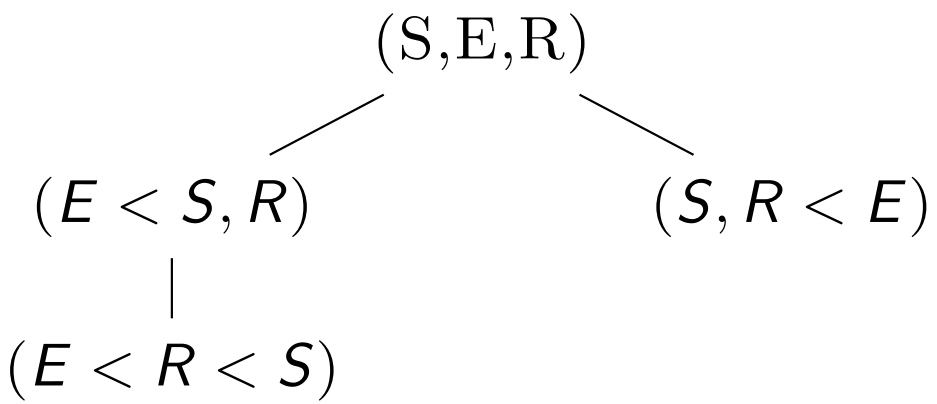
- Bobaljik's *ABA generalization holds for tense syncretism across a variety of languages, but FUTURE does give rise to apparent *ABA violations
- Monotonicity offers a more general notion of *ABA with a partial order of tenses in the spirit of Reichenbach (1947)
- A strong upper bound on the range of typological variation

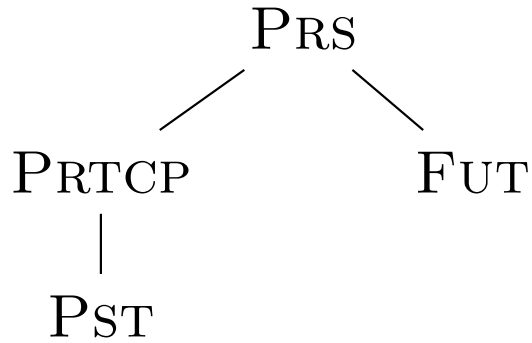
> The only permitted but absent pattern: syncretism of PAST and FUTURE to the exclusion of the other tenses.

Take-Home Message

Any generalization over morphological paradigms

- requires an independently motivated base hierarchy
- Morphological tense hierarchy is motivated by semantic tense hierarchy





- Monotonicity as an effective high-level description for morphological variation

References

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Thank you!

Appendix I: Another Example

Example: Pronoun Syncretism (Harbour 2015, 2016)

(1)	a.	mi, ni, ehi (ABC)	Jarawa
	b.	n!aa, n!uu, n!uu (ABB)	Damin
	c.	ne, ne, e (AAB)	Winnebago
	d.	* I, you, I (ABA)	

- Given the number ordering $3 < 2 < 1$ (Zwicky 1977):
  - No **monotonic** function from $1, 2, 3$ to A, B, C can produce ABA! (Graf 2018)

Appendix II: Data Sampling

Example: Two types of Persian verbs

AAAA: xord – xorde – xor – xord ‘eat’

PST – PRTCPL – PRS – FUT

AABA: did – dide – bin – did ‘see’

PST – PRTCPL – PRS – FUT

Appendix III: Monotonicity Definition

- Given an ordering $\leq$ over a set $\{p, q, r, s, \ldots\}$ such that

$$p \leq r \leq s$$

  one cannot map both p and s to some A without also mapping r to A.

- If $\leq$ is a linear order, monotonicity corresponds exactly to the *ABA generalization.