*ABA Generalizes to Monotonicity: An Argument from Verb Stem Syncretism

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Overview Bobaljik (2012) investigates the range of possible verb stem syncretisms in English and German for present (PRS), perfect participle (PRTCP), and past (PST), and notes that in line with the *ABA generalization, PRS and PST are never syncretic to the exclusion of PRTCP. I show that Bobaljik's prediction is only partially borne out once one considers a wider range of data: ABA patterns do arise, but only if one also considers future tense (FUT). This is problematic for Bobaljik's system, but can be readily explained via a partial order of morphological tenses in the monotonicity framework of Graf (2018). Crucially, this partial order is induced by the tense system of Reichenbach (1947) and thus arises from third factor principles (Chomsky 2005).

***ABA in tense** The *ABA generalization of Bobaljik (2012) states that given a fixed order of cells in a morphological paradigm, two cells cannot be syncretic to the exclusion of any cells between them. While Bobaljik is mostly concerned with the absence of ABA in adjectival gradation (*good-better-best*, but not *goodest*), he briefly discusses tense syncretism in verb stems. He notes that no verbs in English and German display ABA patterns if one assumes an order of PRS-PRTCP-PST. This order can be expressed in terms of structural containment, with PRS as a substructure of PRTCP, which in turn is a substructure of PST (Bobaljik 2012:235). Bobaljik's approach makes two predictions under the natural assumption of a single containment hierarchy for tense: (I) PRS and PST are never syncretic to the exclusion of PRTCP, and more generally (II) all tenses can be linearly ordered across languages so that no ABA patterns ever arise. I show that (I) is true, whereas (II) is false.

Data The results reported here are based on a typologically diverse opportunity-sample of tense suppletion in more than 20 languages, including Altaic, Germanic, Indo-Iranian, Romance, and Slavic, among others. The comparison of tense suppletion is sometimes complicated by person/number suppletion within a single tense paradigm. For simplicity, I assume that two tenses have distinct stems if their stems differ for at least one person/number cell. This decision does not affect the core claims with respect to (I) and (II). With an ordering of PST-PRTCP-PRS-FUT, the following patterns are attested in the data (stem roots are in bold, and ∅ indicates an empty stem):

(1) AAAA *Turkish*: **gel**di, **gel**miš, **gel**iyor, **gel**eçek
(2) AABB, *Japanese*: **shit**a, **shit**eita, **suru**, **suru**
(3) AABA, *Serbo-Croatian*: **hte**o sam, **hte**o, **hoć**u, **hte**ću
(4) ABCD, *German*: **warf**, ge**worf**en, **wirf**, **werf**en
(5) AABC, *Sindhi*: **wa**yo, **wa**yo ho, **wan**ye t^ho, **wi:n**do
(6) AAAB, *French*: **all**, **all**, **all**, ∅ir
(7) ABCC, *Kurdish*: **xwar**d, **xor**ia, **xwei**d, **xwei**d
(8) ABCB, *Spanish*: **fu**, ∅i, **v**, ∅ir
(9) ABBB, *English*: **went**, **go**ne, **go**, will **go**
(10) ABBC, *French*: **vin**, **ven**, **ven**, **vien**dr

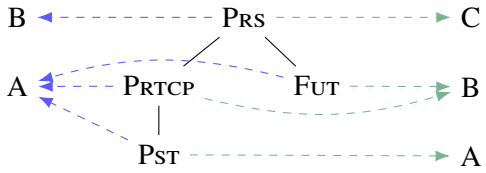
Out of all logically possible patterns, only 5 are unattested: ABAX (where FUT is A, B, or C), ABBA, and ABCA. The absence of ABAX patterns shows that syncretism of PRS and PST to the exclusion of PRTCP is not attested, confirming (I). The behavior of FUT is problematic, though. While FUT is never syncretic with PST to the exclusion of either PRS or PRTCP, AABA and ABCB violate the *ABA generalization. Note that there is no way of totally ordering all four tenses such that there are no ABA configurations, disproving (II). But if one allows for partial orders, ABA patterns with FUT can be accounted for in terms of Graf's (2018) monotonicity constraint.

Monotonicity Monotonicity is a mathematical property that corresponds roughly to the linguistic notion of order preservation. 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. But monotonicity is more general because it is also defined for partial orders. Suppose that $p \leq r \leq s$ as before, and $p \leq q$, but q is unordered with respect to r and s. Then a monotonic mapping could map p and r to A but q and s to B. This is allowed because there is no configuration of three linearly ordered elements where the middle piece is not mapped to the same thing as the other two elements.

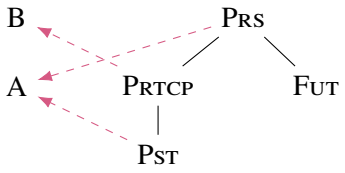
Graf (2018) posits monotonicity as a more abstract version of the *ABA principle and shows how it explains typological gaps in adjectival gradation, case syncretism, and the Person Case Constraint,

among others. Graf deliberately abstracts away from how monotonicity is encoded in the grammar, as this varies greatly across domains. His high-level approach also works for the data in (1)–(10). Suppose that PRS ≤ PRTCP ≤ PST, and PRS ≤ FUT, but FUT is unordered with respect to PRTCP and PST. Then FUT can be syncretic with any one of the three tenses to the exclusion of the others, allowing for a limited range of ABA patterns. This is illustrated in (11) for the attested *ABA violations AABA and ABCB. Example (12) shows that the unattested ABAX patterns do not obey monotonicity.

(11)

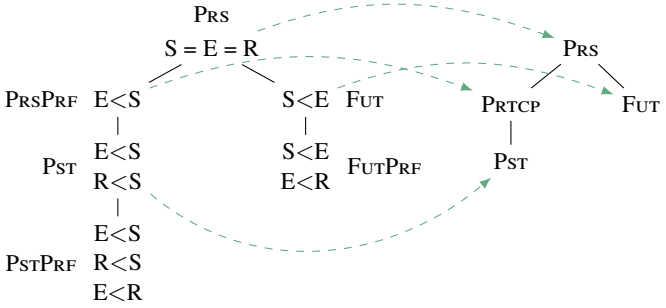


(12)



Semantic motivation The proposed hierarchy of temporal stems is independently motivated in terms of Reichenbach's (1947) tense system. In this system tense denotes a three-way relation between speech time (S), event time (E) and reference time (R). This allows for 13 different logical tenses, which can be ordered in terms of their inequality statements. Once one considers only those tenses that are morphologically realized across languages as in (13), the order in (11) emerges clearly.

(13)



The only contentious issue is the locus of PRTCP, which could be associated with present perfect, past perfect, or future perfect. There are three reasons for identifying PRTCP with present perfect in (13): 1) Semantically, present perfect is the default as the semantics of the past/future perfect follow from the semantics of the former combined with an account of past/future tense. 2) The present perfect is the most frequent perfect construction (Bowie and Aarts 2012 for English). 3) The hierarchy of tense is an implicational hierarchy; if a language has a past perfect or a future perfect, it is very likely that it also has a present perfect (whereas the reverse does not necessarily hold). Once this specific connection between semantic and morphological tenses is made, the availability of some ABA patterns with FUT is due to the fact that the semantic relations between morphological tenses only induce a partial ordering.

Containment reinterpretation The monotonicity account can be interpreted as a high-level description of a Bobaljik-style containment system. For example, one could posit two distinct containment hierarchies for tense (PRS-PRTCP-PST and PRS-FUT), or there might be a single hierarchy PRS-PRTCP-PST where FUT can occur at various positions. This does not explain, though, why tense in general and FUT in particular gets to behave this way. The monotonicity perspective provides an answer by relating tense syncretism to the conceptual space of tense as expressed by Reichenbach (1947).

Conclusion I have shown that Bobaljik's *ABA generalization holds for tense syncretism across a variety of languages, but only for PRS, PRTCP, and PST. FUT does give rise to apparent *ABA violations, but these are expected if one combines monotonicity — a more general notion of *ABA — with a partial order of tenses in the spirit of Reichenbach (1947). This establishes a strong upper bound on the range of typological variation, with the only permitted but unattested pattern being syncretism of PST and FUT to the exclusion of the other tenses. Like the absence of AAB patterns in adjectival gradation, this might be due to independent factors, the precise nature of which is left to future work.

Bobaljik, J.D. 2012. *Universals in Comparative Morphology: Suppletion, Superlatives, and the Structure of Words*. MIT Press. ● **Bowie, J. & B. Aarts. 2012**. Change in the English infinitival perfect construction. *The Oxford handbook of the history of English*:200-210. ● **Chomsky, N. 2005**. Three factors in language design. *Linguistic*

inquiry, *36*(1), pp.1-22. ● **Graf, T. 2018**. Monotonicity as an effective theory of morphosyntactic variation. Ms., Stony Brook University. ● **Reichenbach, H. 1947.** *Elements of Symbolic Logic*. MacMillan.