The subtractive pattern of auxiliaries

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Auxiliaries are known to arise either (i) with a certain inflectional category (*Additive pattern*), or (ii) in the combination of such categories (*Overflow pattern*; Bjorkman 2011). In this paper, we highlight an underdescribed third pattern where verbal inflectional information is lost: ***The Subtractive pattern*** (1).

(1) **Subtractive Pattern**
In a combination of inflectional categories X and Y, where X is typically marked by an Aux(X), Aux(X) is absent

Based on a small survey of languages where (1) is instantiated, we argue that the subtractive pattern reflects markedness-related dissimilation effects analogous to clitic reduction and deletion in varieties of Basque (Arregi & Nevins 2012). Crucially, (1) differs from both *Additive* and *Overflow* patterns in that it involves optional loss of inflectional information. Our account extends the theoretical typology of auxiliaries and is most naturally accommodated under a view of auxiliaries as a morphological repair to feature combinations (cf. Cowper 2010, Bjorkman 2011). Here, we focus first on omission, and then on reduction, of the perfect and/or passive auxiliaries in Swedish, Lithuanian, Serbian, and Italian dialects.

Auxiliary Omission **(i) Swedish HAVE** (*Sw.* **Ha**) combines with a dedicated perfect participle to form the perfect (Supine; SUP). Perfect HAVE – which inflects for tense but not agreement – can optionally be omitted in non-V2 context (e.g. Platzack 1986, Heinat 2012) if tense is recoverable from the context (2). V2 omission is ungrammatical (3). Other auxiliaries like Passive BE and Possessive HAVE cannot be omitted. Importantly, Perfect HAVE always occurs adjacent to the perfect participle in non-V2 clauses.

(2) Där *kanske* han inte ~~**har**~~ varit.
there maybe he not (has) been.SUP
'He maybe hasn't been there.'

(3) Där *(**har**) han inte varit.
there has he not been.SUP
'He hasn't been there.'(*Sw.*; Heinat 2012:89)

Further, some dialects allow reduction of Perfect HAVE to an infinitive in V2-contexts (Larsson 2009). **(ii) Lithuanian BE** (*Lith.* **Būti**) forms the perfect and passive with a dedicated past participle for each inflectional category. BE can be omitted in the present tense, but not in the past tense (4; Ambrazas et al. 1997; Šereikaitė 2022). **(iii) Serbian Perfect BE** (*Ser.* **biti**) is an auxiliary clitic which forms the perfect with an active participle. BE can be omitted but only in 3P or with an overt subject (5; Meerman 2024). In Lithuanian and Serbian, participles independently show gender and number but not tense or person.

(4) Aš ~~**esù**~~ jaū
I be.1SG.PRS already
pavalgęs
eaten.ACT.PTCP.MSC.SG
'I have eaten already.'(*Lith.*; Ambrazas 1997)

(5) Ja ~~**sam**~~ ga
I (be.1SG.PRS) him
video.
seen.ACT.PTCP.MSC.SG
'I saw him.' (*Serbian*)

Auxiliary Reduction As previously mentioned, **(i) Swedish Perfect HAVE** can be reduced to an infinitive in V2-contexts (but crucially not omitted) in some dialects in both present and past tense (6–7).

(6) Jag *har*/**ha** *diskat*.
I have.PRS/.INF dish.wash.SUP
'I have washed the dishes.'(Larsson 2009)

(7) Dä *hade*/**ha** kanske *vari* värre
it had.PST/.INF maybe be.SUP worse
'It could have been worse.'(Larsson 2014)

Similarly to Swedish, American English allows non-finite HAVE-reduction (11), and in Appalachian English, omission (12).

(8) John **should've/-a** left. (Kayne 1997)

(9) You ought to **seen** us. (Montgomery 2008)

Further, **(ii) Marsalese Italian** finite Perfect HAVE (and motion verbs GO, STAY) can be reduced to the bare verb stem in all forms except the 1PL & 2PL (other forms cause stem-changes), see (8).

(10) ... un ci {*ha-ju* / *ha-i* ...} / **ha** statu mai.
... not there.CL have-1SG / have-2SG ... / have.STEM been never
'I/You(Sg.) have never been there.' (*Marsalese*; Cardinaletti and Giusti 2001:384)

(iii) Some Italian dialects also show person- (and number-)based splits in *Auxiliary selection* between *Esse* 'be' and *Avere* 'have' in the perfect including dialects where HAVE is restricted to 3P only, or PL only (Manzini & Savoia 2005; Legendre 2010). In all cases (i–iii), tense/agreement information is lost.

All the subtraction patterns involve loss of tense (and person) inflection. However, besides recoverability, the conditions on omission vary from language to language. Swedish only allows omission in a non-V2 position while the other languages restrict omission to certain tenses or ϕ-features (similar to the different parameters of *pro*-drop; e.g. Holmberg 2010). This *Subtractive Pattern* of auxilaries, where inflectional information is lost, is crucially different from the *Additive* and *Overflow Pattern* of auxiliaries with individual or a combination of inflectional categories. The Subtractive Pattern occurs in both types of language in contexts where auxiliaries usually arise yet are omissable.

Proposal We assume that Perfect HAVE in languages like Swedish and Italian is more marked than BE and we encode this formally as BE + a perfect-specific prepositional feature [P] (Benveniste 1966; Kayne 1993; Bjorkman 2011). We propose that marked verbal inflectional features (cf. Adger 2003) can trigger dissimilatory impoverishment rules when two marked elements occur in a given locality domain. Arregi & Nevins (2012) discuss similar cases in varieties of Basque where multiple marked participant clitics give rise to clitic impoverishment or deletion.

Our account crucially requires inflectional features to apply role in the appearance of auxiliaries aries, but all such featural theories are compatible with our proposal. For concreteness, we assume Bjorkman's (2011) approach to auxiliaries in which lexical verbs have one agreement slot [INFL:_] for inflectional features from higher functional heads. Combination with further features requires head movement. If head movement is unavailable, leaving an inflectional feature stranded, the morphology saves it by inserting an auxiliary. In Swedish, the combination of tense-deletion due to [P] (Aux-Reduction) and dissimilatory deletion of two adjacent INFL:PERF-features, on HAVE and the perfect participle, triggers *Have*-omission (cf. Snorrason 2024 for a similar account), see (11–12).

(11) [… Perf $_{[P][\text{INFL:TNS}]}$ $_{[\text{INFL:PERF}]}$ $V_{[\text{INFL:PERF}]}$]
(Agree)

(12) [INFL:TNS] → Ø / _ [P]
[INFL:PERF] → Ø / _ [INFL:PERF]

Marsalese allows an impoverishment rule for agreement similar to the tense rule in (10), while in other Italian dialects, [P] can trigger deletion of itself if e.g. person (3P only) or number (PL only) is recoverable. This causes insertion of unmarked *essere* 'be' instead of HAVE ([INFL:~~P~~,PERF] ↔ ~~avere~~ *essere*).

There is no evidence for a [P]-feature in Lithuanian and Serbian as they have BE-Perfects. Instead, feature underspecification and dissimilation conspire to trigger omission. Following Bjorkman (2011), we assume that unspecified features are non-visible to Agree and cannot trigger auxiliary insertion. We assume that present tense is the default/unspecified value for tense inflection and that 3P is similarly default/unspecified. Thus, for both Lithuanian and Serbian BE-omission is only dropped when person inflection is lost. We argue this is due to a dissimilatory deletion rule as in (10) which deletes [INFL:PERF] and person in the context of another [INFL:PERF], i.e. the active perfect participle.

A zero auxiliary analysis does not capture these facts since it fails to explain why only the perfect auxilaries, and not other auxiliaries in the same languages, can be omitted and likewise reduced. Both factors point towards morphology playing role in omission. Similarly, these facts are not obviously accounted for within approaches where auxiliaries are c-selection features (Pietraszko 2023).

Conclusion: An underdescribed pattern of Auxiliary omission and reduction – the subtractive pattern of auxiliaries – is distinct from the previously noted *Overflow pattern* and occurs in a diverse set of languages including English, Swedish, Italian, Lithuanian and Serbian. This pattern can be explained with postsyntactic dissimilation rules and feature invisibility. This explanation is most naturally accommodated under a morphosyntactic approach to auxiliaries (e.g. Cowper 2010; Bjorkman 2011) providing an argument in favour of such theories.