The Syntax of Auxiliaries From a Cross-linguistic Perspective*

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1 Introduction

The Question: Why do auxiliary verbs like BE occur in natural language?

A Traditional Answer: Auxiliaries are **default** verbs; they occur to realize inflection that is not able to be realized on a main verb.

- This talk argues for a particular implementation of this traditional answer, based on largely undiscussed variation in the distribution of auxiliary constructions.

- More specifically, I argue that auxiliary BE is a **morphological default** inserted to realize inflectional material that is **syntactically "stranded"** from the main verb.

- This is similar to recent analyses proposed for English *be* (Schütze, 2003; Cowper, 2010), but differs in order to provide a **unified** analysis of the cross-linguistic profile of auxiliary BE.

Plan for the talk:

§2 Illustrate two patterns of auxiliary use, motivating default BE.

§3 Develop a simple model of verbal inflection, framed in terms of Agree.

§4-5 Apply this model to the observed typology of auxiliary constructions.

§5 Implications of the analysis with respect to reduced relative clauses.

§6 Conclusions.

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2 Two patterns of auxiliary use: additive and overflow

A typology of auxiliary patterns:

- **Additive** pattern: certain inflectional categories always occur with an auxiliary.

- **Overflow** pattern: auxiliaries appear only in **combinations** of categories.

2.1 Additive auxiliary patterns

Familiar from languages like English and French: certain inflectional categories "come with" an auxiliary. If multiple auxiliary-taking categories co-occur, multiple auxiliaries appear.

English: both the **passive** and the **progressive** trigger insertion of auxiliary *be* (1a-b). When the two co-occur, you get two auxiliaries (1c):

(1) a. The children **were** eating the cake. *Progressive*
     b. The cake **was** eaten. *Passive*
     c. The cake **was being** eaten. *Progressive Passive*

Basque: (obligatory) **aspectual** inflection on the main verb requires **tense** to be marked on an associated auxiliary (Laka, 1993; Arregi, 2000). The present perfective and past imperfective are illustrated in (2) (examples from Arregi 2000):

(2) a. Jon-ek liburu irakurr-i **dau.** *Present Perfective*
         Jon-ERG book   read-PFV AUX.PRES[1]
         "Jon has read the book."
     b. Jon asarra-tzen **sa-n.** *Past Imperfective*
         Jon get.angry-IMPF AUX-PAST
         "Jon used to get angry."

Finnish: the **perfect** in Finnish is formed with a present or past tense form of the verb *olla* 'to be' followed by a participle. Present and past perfects are illustrated in (3a-b):
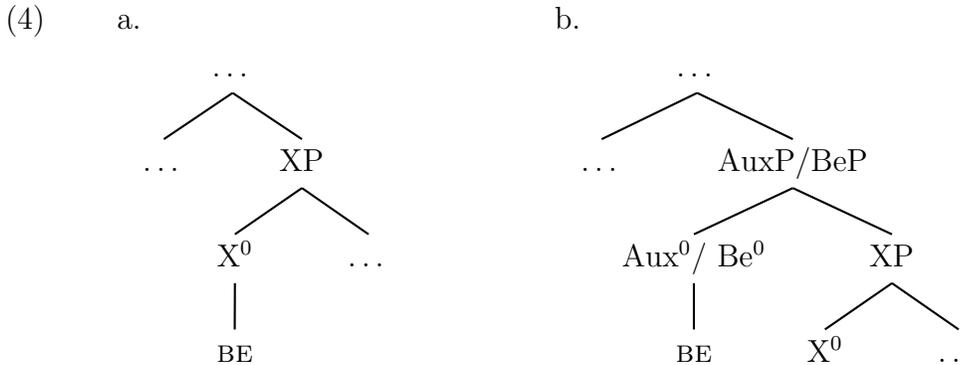
(3) a. Lapset   **ovat**   syö-neet kakku. *Present Perfect*
         The.children be.PRES eat-PTCP the.cake
         "The children have eaten the cake."
     b. Lapset   **olivat** syö-neet kakku. *Past Perfect*
         The.children be.PAST eat-PTCP the.cake
         "The children had eaten the cake."

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[1]Basque auxiliaries alternate between BE and HAVE forms (auxiliary selection), with the choice determined by the transitivity/agreement properties of the clause (Arregi, 2004). Time does not permit this alternation to be discussed here, and auxiliary forms are therefore glossed simply as AUX.

It should also be noted that a small set of verbs in Basque do allow synthetic past and present forms (Arregi, 2000; de Rijk, 2007); these simple tense verbs do *not* appear to mark aspectual contrasts (Arregi, 2000). This fact will be taken up in section 5.2.

A simple selectional account:

- The additive pattern has lent itself to the hypothesis that BE is **syntactically represented**, either as the head of associated inflectional projections, as in (4a), or as the head of independent projections that subcategorize for inflectional projections, as in (4b):

(4)   a.   b.

```
         . . .                                    . . .
        /    \                                   /     \
     . . .    XP                             . . .    AuxP/BeP
             /  \                                     /        \
           X⁰   . . .                          Aux⁰/ Be⁰       XP
           |                                        |         /  \
           BE                                       BE       X⁰   . . .
```

- A range of questions have arisen from such representations:

    ○ Is Aux^0 is a separate syntactic category from V^0?

    ○ Is it the auxiliary or the main verb that carries inflectional *semantics*?

    ○ Why do auxiliaries *not* have to occur in environments such as reduced relative clauses? (See §6)

- As we will see immediately below, however, these kinds of representations are largely incompatible with auxiliary patterns in other languages: the **overflow** pattern.

2.2   Overflow auxiliary patterns

In the overflow pattern, **individual** categories do not require the use of an auxiliary, but certain **combinations** of categories do.

Framed syntactically, this distribution would look something like (5):

(5)   * [AuxP [XP]]
             * [AuxP [YP]]
         ✓ [AuxP [XP [YP]]]

What I will claim instead is that the structural combination of XP and YP prevents X^0 from establishing a relationship with V^0, triggering the occurrence of BE.

Kinande shows an overflow interaction between **aspect** and **tense**.

    Simple verb forms exist for past and for various aspects (imperfective, progressive, incompletive, and inceptive), as we see in (6a-b).

    An **auxiliary** appears, however, in a past tense aspectual form.

(6)   a.   tw-**á**-húma   *Recent Past*
                1PL-PAST-hit
                'We hit (recently, not today)'

                b.   tu-**nému**-húma   *Progressive*
                1PL-PROG-hit
                'We are hitting'

                c.   tw-**á-bya**   i-tu-**nému**-húma   *Recent Past + Progressive*
                1PL-PAST-**be** LNK-1PL-PROG-hit
                'We were (recently, not today) hitting.'

Palestinian Arabic also shows an overflow interaction between **aspect** and **tense**. **Simple** forms exist for the (present) imperfective and past (perfective) (7a-b), but an **auxiliary** appears in the past imperfective (7c).

    (Examples from Karawani and Zeijlstra 2010).

(7)   a.   katb-at   *Past*
                write.PST.PFV-3SG.F
                "She wrote."

                b.   b-tuktob   *Imperfective*
                B-write.IMPF
                "She usually writes." ("…will write")

                c.   **kaanat** tuktub   *Past + Imperfective*
                be.PST write.IMPF
                'She used to write."

Latin shows an overflow interaction between **aspect** and **voice**. **Simple** tensed forms exist for both the perfect and the passive in isolation (8a-b), but the perfect passive requires an auxiliary (8c):[2]

(8)   a.   Puellae   crustulum   **consumpserunt**.   *Perfect*
                girl-PL.NOM small.pastry-ACC eat-PL.PFV
                "The girls ate the little pastry."

                b.   Crustulum   **consumitur**.   *Passive*
                  small.pastry-NOM eat-PRES.PASS
                "The little pastry is (being) eaten."

                c.   Crustulum   **consumptum est**.   *Perfect + Passive*
                  small.pastry-NOM eat-PASS.PTCP **be**.3SG.PRES
                "The little pastry was / has been eaten."

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[2]This is true not only of regular passives, but also of deponents – verbs that are syntactically transitive but morphologically resemble passives (Embick, 2000).

In the overflow pattern, no single syntactic category is correlated with the presence of BE.

> **This argues *against* a syntactic representation of auxiliaries.**
> There is no head X^0 to which BE can be merged, or which BE can select.

Auxiliaries as defaults: The overflow pattern instead suggests that auxiliaries realize inflectional information that was for some reason unable to be realized on the main verb.

This could be an arbitrary morphological fact: no "slot" on the verb for some affixes.

I will argue instead for a **structural** account: complex inflectional syntax causes certain inflectional features to be "stranded", i.e. **syntactically** unable to combine with the verb.

This structural account will **unify** the analysis of the additive and overflow patterns.

3 An Agree-based model of verbal inflection

This section shows that a very simple syntax for verbal inflection can generate the overflow pattern of auxiliary use, together with the following principle governing the occurrence of auxiliary BE:[3]

> Auxiliary BE is inserted to realize verbal inflection that would otherwise be **"stranded"**, i.e. that is unable to combine with a main V^0.

Agree and verbal inflection

- For a **uniform** model of auxiliary insertion to be viable we need a cross-linguistically **uniform** mechanism for manipulating verbal inflection.

- Work on verbal inflection, however, presents a **non**-uniform array of syntactic mechanisms:

  ○ Lowering (Chomsky, 1957; Bobaljik, 1995; Embick and Noyer, 2001, a.o.)

  ○ Raising (Emonds, 1978; Pollock, 1989; Chomsky, 1993, a.o.)

  ○ Agree (Chomsky, 1998; Adger, 2003; Pesetsky and Torrego, 2007, a.o)

- Neither Raising nor Lowering can offer a unified approach to auxiliaries and verbal inflection.

  ○ Languages that differ precisely in whether they have verbs *in situ* or in T^0 have very similar auxiliary profiles: consider **English** and **French** (Emonds, 1978; Pollock, 1989)

(9) a. English: auxiliaries in passive and perfect (and progressive)
    (i) The cake was eaten.
    (ii) The children have eaten the cake.
    b. French: auxiliaries in passive and perfect
    (i) Le gâteau était mangé.
    (ii) Les enfants ont mangé le gâteau.

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[3]Though we are discussing here only auxiliary BE, I assume that the same approach will apply to copular an predicative BE as well. Similar principles are advanced in Schütze (2003) and Cowper (2010) for English, and implicitly assumed by both Embick (2000) (for Latin) and Arregi (2000) (for Basque).

- This leaves **Agree** as a potentially unified mechanism for the manipulation of verbal inflection.

- Two things in need of clarification for an Agree-based approach to inflection:

  1. Directionality of Agree

  2. Locality of Agree with respect to verbal inflection

Directionality of Agree: Where are inflectional feature **values** introduced?

- The theoretical role of projections such as Asp^0 and T^0 is to introduce inflectional information, and provide the locus of its semantic interpretation.

  ○ This is reflected in Raising and Lowering approaches, where affixes (or their features) are introduced in these positions.

  ○ Not reflected in standard Agree:

    – Chomsky (1998): only unvalued **and** uninterpretable features act as Probes.

    – Pesetsky and Torrego (2002, 2007): only unvalued **or** uninterpretable features act as Probes.

    – **valued** inflectional features must therefore be introduced on V^0 (and on higher intermediate inflectional heads).[4]

  ○ Evidence that inflectional values are **not** introduced on V^0: morphological mismatches in VP ellipsis.

    (10)   *John **slept** and Mary will <~~sleep~~> too.*

    – Lasnik (1995, 1997) argues convincingly that the possibility of morphological mismatches under ellipsis requires that main verbs be merged *without* inflectional information/features, because if verbs were merged with inflectional information, there would be no level of representation at which antecedent and ellipsis site satisfy identity.

- I therefore adopt a non-standard view of Agree, in which feature valuation can occur *downward* in a tree. This follows work by many others, including: Baker (2008), Haegeman and Lohndal (2010), Zeijlstra (2010), Merchant (2011), and Wurmbrand (2011), among others.

Locality: What accounts for the locality of inflectional feature transmission?

- Agree is potentially **long-distance**, while inflectional features appear to enter into highly **local** relationships.

  ○ Relativized Minimality (Rizzi, 1990, et seq.) requires only that a feature Agree with the closest *potential* target.

  ○ If all inflectional heads bore features of different types, there could be tense Agreement between T^0 and V^0 even in the presence of inflectional features on an intervening Asp^0.

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[4]Another alternative would be to introduce valued inflectional features on higher functional heads, but to allow Agree to be "parasitic" on some other unvalued or uninterpretable Probe (i.e. a subcategorization feature). If intermediate heads are both sources and targets of inflectional Agreement, however, allowing parasitic Agree would allow inflectional features to travel "up" the tree, contrary to observed patterns.

○ What we seem to find, however, is that every (specified) inflectional head in auxiliating languages blocks feature transmission to all the positions below it.

- To achieve this result, I assume that all inflectional features are different **values** of a single feature **type**: I adopt the notation [INFL:_] from Adger (2003).

Putting this all together:

- Valued inflectional features on functional heads Agree with unvalued counterparts on lower heads. Intermediate heads bear *both* valued *and* unvalued inflectional features.

(11)   *Agree*
        Agree is a relationship between two features such that an unvalued feature [F:_] receives the value of a feature [F:val] of the same type iff:
        a.   A head α containing [F:_] is c-commanded by a head β containing [F:val].
        b.   There is no head γ containing a matching feature [F:(val)], such that γ c-commands α and β c-commands γ.

- This is illustrated in (12), where dashed lines indicate Agree relations. Agree is a relationship between features, though as we are concerned only with a single feature type, for convenience I will often speak of Agree between two heads.

(12)
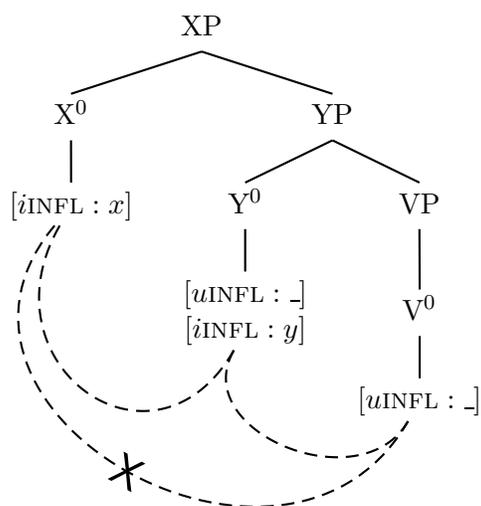
- Mitigating the strict locality of Agree is the **non-specification** of certain feature values: such features are **non-visible** for the purposes of Agree.[5]

- A head without specified inflectional features will never act as an intervenor for Agree, simply because it contains no information that could potentially be a target of Agreement:[6]

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[5]This builds on the concept of featural **markedness**, originally developed in the context of phonology, but long extended to morphology and syntax (Jakobson, 1939, Greenberg, 1966, Olsen, 1997, Comrie, 1976, Dahl, 1985).

[6]Strictly speaking, we must further stipulate that an inflectional head without a positive feature [iINFL:val] cannot contain an [uINFL : _].

(13)
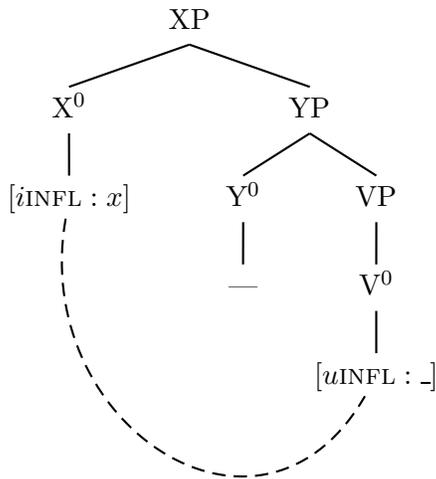
- Languages will differ in which features they choose not to specify, reflecting independently known variation in feature markedness. In particular, the languages under discussion will vary in whether they are perfective-default or imperfective-default.

We are now in a position to more precisely formulate the condition on auxiliary occurrence:

> Auxiliary BE is inserted post-syntactically to support verbal inflectional features that are realized as affixes but which are morphologically interpreted in a head that does not contain V^0.

§4 turns to applying this system to the **overflow** pattern.

4 Accounting for the Overflow Pattern

4.1 Kinande

Recall from (6), repeated in (14), that Kinande uses auxiliaries in tense-aspect combinations, though neither tense nor aspect requires an auxiliary in isolation:

(14)   a.   tw-**á**-húma   *Recent Past*
               1PL-PAST-hit
               'We hit (recently, not today)'

           b.   tu-**nému**-húma   *Progressive*
               1PL-PROG-hit
               'We are hitting'

           c.   tw-**á-bya**   i-tu-**nému**-húma   *Recent Past + Progressive*
               1PL-PAST-**be** LNK-1PL-PROG-hit
   'We were (recently, not today) hitting.'

- (14a) and (14b) each involve only a single active inflectional head, if we assume that **present** T^0 and **perfective** Asp^0 are **unspecified** (and ∴ non-visible) in Kinande,[7] .

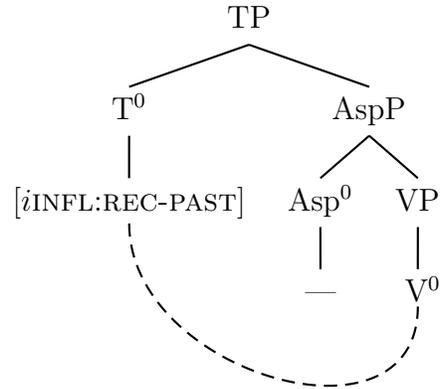[7]Following Nurse (2008) for the Bantu language family generally.

- This head will Agree with V^0 in both cases, leaving no stranded features.[8]

  (Unvalued features have been omitted from these and subsequent trees.)

(15)   a. **tu-nému-húma** (Progressive)
           1PL-PROG-hit
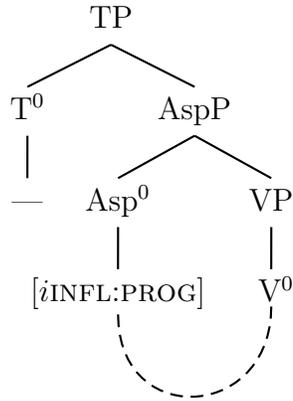
         b. **tw-á-húma** (Recent Past)
            1PL-PAST-hit

- In a past progressive, by contrast, both T^0 and Asp^0 will have visible features.

- V^0 will Agree with Asp^0; T^0 subsequently Agrees with Asp^0, but is blocked from Agreeing with V^0.

- The features of T^0 will be stranded, triggering morphological realization as *twábya*.

(16)   **tw-á-bya**   **i-tu-nému-húma** (Past Progressive)
        1PL-PAST-BE LNK-1PL-PROG-hit

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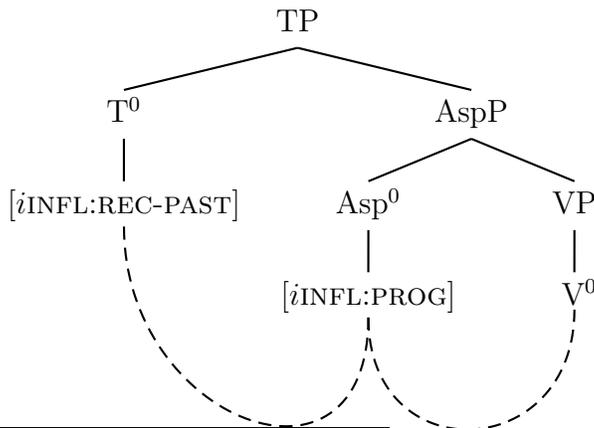
[8]The VP-internal verb of these trees is a simplification. Following previous work, I assume that the Kinande verb does move through VP-external argument-structural projections, corresponding to the 'extension' suffixes.
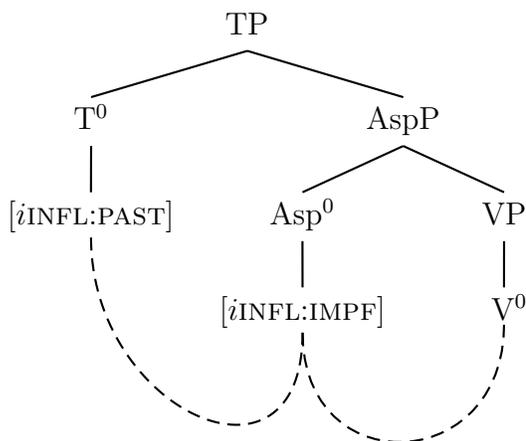
4.2 Palestinian Arabic

(17), repeated from (7), shows that while Palestinian Arabic has simple imperfective and past forms, it requires an auxiliary to express the past imperfective:

(17)   a.   katb-at   *Past*
                write.PST.PFV-3SG.F
                "She wrote."

        b.   b-tuktob   *Imperfective*
                B-write.IMPF
                "She usually writes." ("…will write")

        c.   **kaanat** tuktub   *Past + Imperfective*
                be.PST write.IMPF
                'She used to write."

- This is exactly parallel to Kinande, and a parallel analysis is available: both present T^0 and perfective Asp^0 are unspecified, and therefore non-visible.[9]

- When only one head has visible features, it will be able to Agree directly with the verb (as in (17a-b)).

- Both heads will be syntactically visible, however, in the past imperfective, and so the [PAST] features of T^0 will be stranded.

(18)   **kaanat tuktub**   (Past + Imperfective)
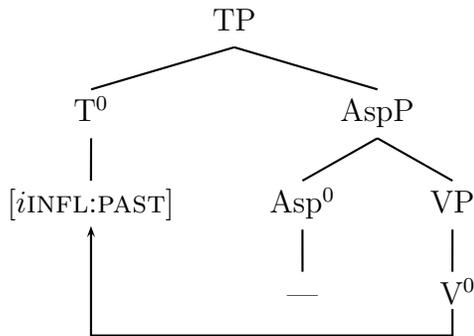   **be**.PST write.IMPF

- Palestinian Arabic differs from Kinande, however, in having **head movement** in the inflectional domain: VSO word orders are often attributed in Arabic to verb movement to T^0 in the presence of a VP/vP subject (Carnie and Guilfoyle, 2000, citing Mohammed 1988 and Fassi Fehri 1993).

- In the past perfective, where Asp^0 is non-visible, we can propose that this arises because Agree between features of T^0 and V^0 is accompanied by head movement, represented by solid angled lines:[10]

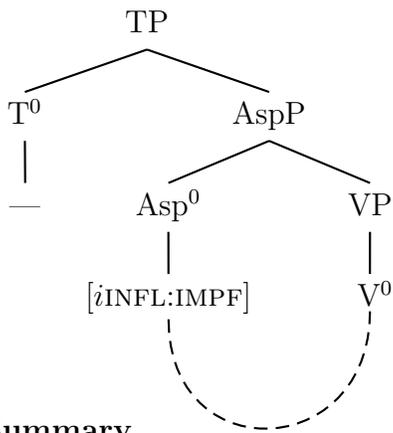[9]On the non-specification of present tense features in the present imperfective, see Benmamoun (1999, 2000).

[10]I assume that head movement occurs only on the basis of a pre-existing Agree relation, as proposed for phrasal

(19) **katbat** (Past)
write.PST.PFV-3SG.F

```
                    TP
          ┌─────────┴─────────┐
        T⁰                   AspP
         │              ┌──────┴──────┐
   [iINFL:PAST]       Asp⁰            VP
         ↑              │              │
         │              —             V⁰
         └──────────────────────────────┘
```

- In the (default present) imperfective, however, T^0 has no visible features and therefore cannot attract V^0 via Agree.

- Were Asp^0 to attract V^0, T^0's [PAST] feature in (18) would not be stranded, and we would predict that no auxiliary would occur.

- The inflectional system therefore predicts that V^0 is lower in the simple imperfective than it is in the past.

- **Independent Support:** Benmamoun (1999, 2000) argues that the simple imperfective verb is lower than a past-inflected verb in at least some varieties of Arabic, citing its position relative to negation and low subjects.[11]

(20) **Imperfective: b-tuktob**

```
                    TP
          ┌─────────┴─────────┐
        T⁰                   AspP
         │              ┌──────┴──────┐
         —            Asp⁰            VP
                        │              │
                 [iINFL:IMPF]         V⁰
                        └ ─ ─ ─ ─ ─ ─ ─┘
```

Interim Summary

- In Palestinian Arabic, we have seen that the distribution of head movement in the inflectional domain has the potential to interact with the distribution of auxiliary constructions.

- We will see in the next section that when V^0 *does* move to intermediate projections, it can potentially Agree with more than one head: this will be the case in Latin.

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movement by Chomsky (1998). This requires that head movement occur in the narrow syntax, as argued in an increasing body of work (Lechner, 2006; Matushansky, 2006; Hartman, 2010; Iatridou and Zeijlstra, 2010). As a result, head movement will never target a head without visible features.

[11]As in Kinande, it is possible that the verb raises out of VP/vP to some intermediate position still below AspP. This would account for the fact that VSO order is still possible with imperfective main verbs.

4.3   Latin

Recall from (8), repeated in (21), that in the cases under discussion, Latin uses an auxiliary only in the combination of the perfect and the passive, as in (21c).

(21)   a.   Puellae   crustulum   **consumpserunt**.   *Perfect*
            girl-PL.NOM small.pastry-ACC eat-PL.PFV
            "The girls ate the little pastry."
       b.   Crustulum   **consumitur**.   *Passive*
            small.pastry-NOM eat-PRES.PASS
            "The little pastry is (being) eaten."
       c.   Crustulum   **consumptum est**.   *Perfect + Passive*
            small.pastry-NOM eat-PASS.PTCP **be**.3SG.PRES
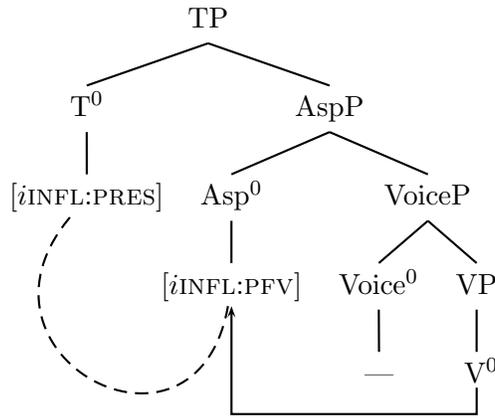   "The little pastry was / has been eaten."

- In Latin we have *three* inflectional categories interacting: tense, aspect, and voice.

- In all cases in (21), the main verb shows inflection for **two** inflectional categories.

- This can be accounted for by **head movement** of V^0 to intermediate projections: this allows it to become **local** for Agree with higher projections: i.e. T^0:[12]
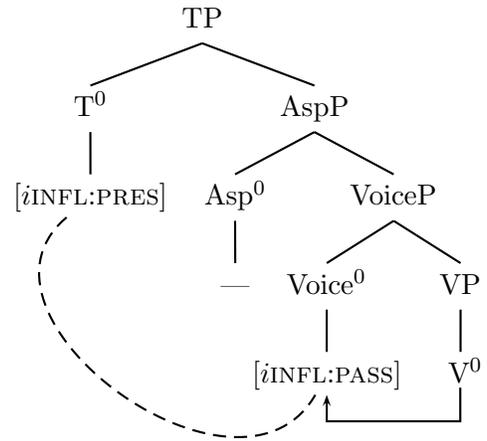
(22)
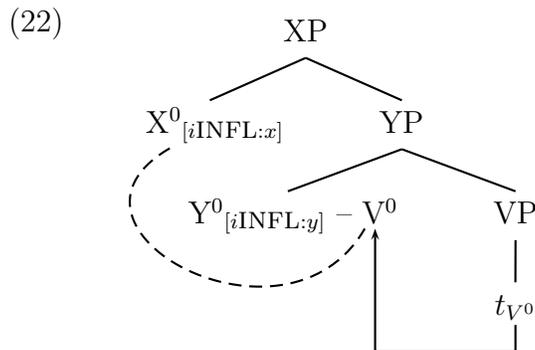
- In the perfect and the passive, V^0 Agrees with either Asp^0 or $Voice^0$; we assume that active $Voice^0$ and imperfective Asp^0 are not specified (hence non-visible).

- Head movement accompanies Agree between V^0 and $Voice^0$, and between V^0 and Asp^0, and as a result V^0 is accessible to Agreement from T^0.

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[12]Languages will differ, perhaps arbitrarily, on whether particular Agree relationships are accompanied by head movement. This instantiates widely assumed variation between languages (whether they have V^0-to-T^0 or V^0-to-C^0 movement, for example) on a smaller scale.

(23) a. **consumpserunt** (Perfect)
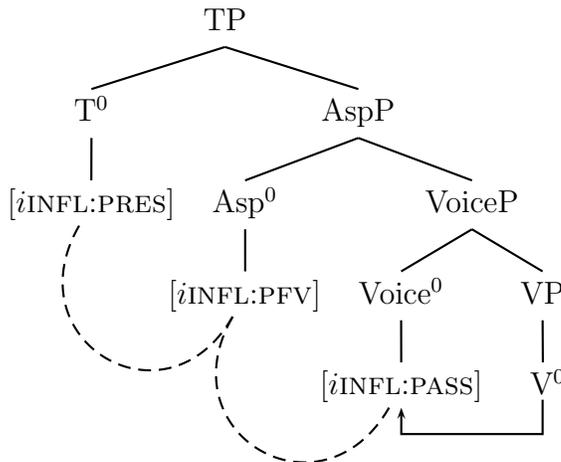   eat-PL.PFV

```
                TP
              /    \
           T⁰       AspP
            |      /    \
  [iINFL:PRES]  Asp⁰    VoiceP
                 |      /    \
         [iINFL:PFV] Voice⁰  VP
                       |      |
                       —     V⁰
```

b. **consumitur** (Passive)
   eat-PRES.PASS

```
                TP
              /    \
           T⁰       AspP
            |      /    \
  [iINFL:PRES]  Asp⁰    VoiceP
                 |      /    \
                 —   Voice⁰  VP
                       |      |
                [iINFL:PASS]  V⁰
```

- When **both** Voice⁰ and Asp⁰ contain visible features, the overflow interaction arises: assuming that there is **no** head movement between these positions, V⁰ will remain in Voice⁰, in which position it will be inaccessible to Agreement with T⁰, stranding T⁰'s features.[13]

(24) **consumptum est**   (Perfect Passive)
      eat-PASS.PTCP **be**.3SG.PRES

```
                TP
              /    \
           T⁰       AspP
            |      /    \
  [iINFL:PRES]  Asp⁰    VoiceP
                 |      /    \
         [iINFL:PFV] Voice⁰  VP
                       |      |
                [iINFL:PASS]  V⁰
```

Interim Summary

- In Latin the **presence** of head movement of V⁰ to higher inflectional heads allows the verb to express more than one inflectional category.

- As in Palestinian Arabic, however, the *absence* of head movement in a particular corner of the inflectional system gives rise to an overflow auxiliary pattern.

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[13]Embick (2000) presents an analysis of the Latin facts similar in spirit to this one. On that account Latin T⁰ is stranded in the perfect passive because T⁰ was unable to attract Asp⁰ precisely when Asp⁰ contains passive features. The advantage of the account proposed here is that head movement is *uniformly* absent between two particular positions, and the presence or absence of head movement is linked to the instantiated Agree relation (rather than to other features coincidentally present).

4.4 Summary of the system

In this section we have seen that a very simple model of verbal inflection can account for the overflow pattern of auxiliary use, when taken together with the idea that auxiliary BE realizes stranded inflectional features.

1. Inflectional features are manipulated by **Agree**, and all (visible) inflectional heads are intervenors for this Agree.

2. Some inflectional feature values are **unspecified**, and therefore **non-visible** to Agree.

3. **Head movement** may accompany Agree, bringing a head (i.e. V^0) into local relationships with more than one inflectional head

Languages differ both in the feature values they choose to specify, and in their distribution of head movement, accounting for variation in auxiliary patterns.

In the next section we will see that this same system also accounts for the **additive** pattern of auxiliary use, without any further machinery.

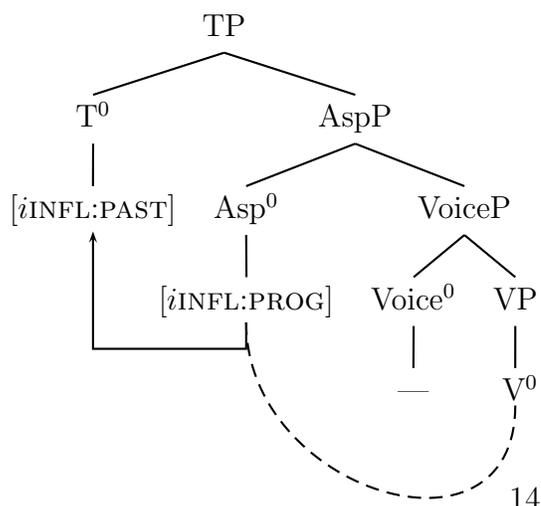# 5 Accounting for the Additive Pattern

5.1 English

With English we arrive at the additive pattern. As we will see, the mechanisms underlying the expression of auxiliaries will remain unchanged, but circumstances will be such that any combination of two visible inflectional heads will result in stranded features.

**Unspecified (and ∴ non-visible) values:** Non-progressive Asp^0 and active $Voice^0$

Head movement: T^0 attracts $Voice^0$ and Asp^0. V^0 remains *in situ*[14]

- In the progressive V^0 Agrees with Asp^0, and in the passive with $Voice^0$, but neither Agree relation is accompanied by head movement.

- In both cases, T^0 Agrees with a visible inflectional head, but is unable to Agree with V^0.

- A [INFL:PAST] feature is stranded in both cases, triggering insertion of auxiliary *were/was*.
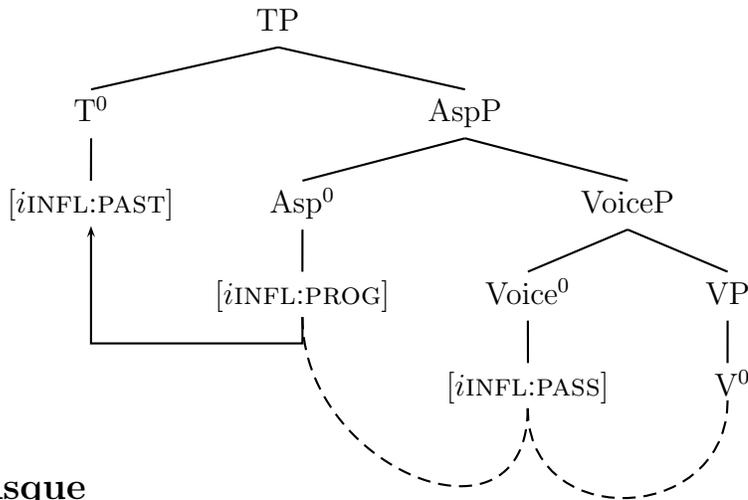
(25)   a. **were eating** (Progressive)   b. **was eaten** (Passive)

14
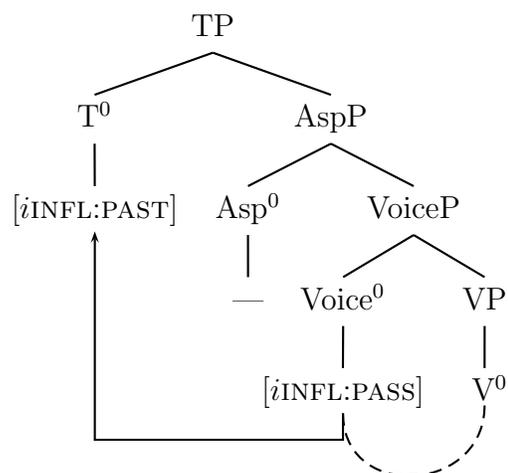
- In the progressive passive, the fact that T^0, Asp^0, and $Voice^0$ all contain visible features leads to features being stranded in two positions.

- $Voice^0$ Agrees with V^0, but V^0 remains *in situ*.

- Asp^0 Agrees with $Voice^0$, but not with V^0. Its [PROG] feature is therefore stranded on $Voice^0$, triggering realization as auxiliary *being*.

- T^0 Agrees with and attracts Asp^0, but also cannot Agree with V^0. Its [PAST] features are likewise stranded, triggering auxiliary *was*.

(26)　　**was being eaten** (Progressive Passive)

```
                        TP
                   /          \
                 T⁰            AspP
                 |          /        \
          [iINFL:PAST]   Asp⁰         VoiceP
                          |         /       \
                   [iINFL:PROG]  Voice⁰      VP
                                   |          |
                            [iINFL:PASS]      V⁰
```

5.2 Basque

Recall from (2), repeated in (27), that Basque obligatorily uses auxiliaries for any combination of tense and aspect:

(27)　　a.　Jon-ek　liburu irakurr-i **dau.**
　　　　　　Jon-ERG book　read-PFV AUX.PRES
　　　　　　"Jon has read the book."
　　　　b.　Jon asarra-tzen　　**sa-n.**
　　　　　　Jon get.angry-IMPF AUX-PAST
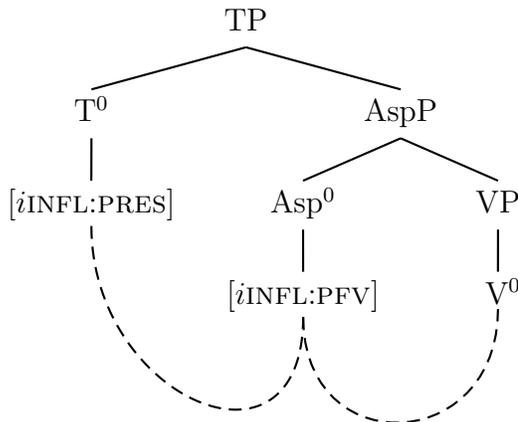　　　　　　"Jon used to get angry."

- The analysis of this pattern will posit that Basque, like Kinande, involves no head movement and only two interacting heads.

- The differences between the languages arise from the fact that Basque specifies all feature values for *both* T^0 and Asp^0 (i.e., there are no non-visible features):

Unspecified ($\therefore$ non-visible) values: none.

Head movement: none.

- Asp^0 Agrees with V^0, but V^0 remains *in situ*.

- T^0 Agrees with Asp^0, but is unable to Agree with V^0.

- Stranded tense features in T^0 require realization on an auxiliary.

(28)   **irakurri dau.**   (Present Perfective)
       read-PFV AUX.PRES

```
                         TP
              ┌───────────┴───────────┐
             T⁰                      AspP
              │                ┌───────┴───────┐
        [iINFL:PRES]         Asp⁰             VP
              ┆                │               │
              ┆          [iINFL:PFV]           V⁰
              ┆                ┆               ┆
              └ ─ ─ ─ ─ ─ ┐   ┆   ┌ ─ ─ ─ ─ ─┘
                          └ ─ ┴ ─ ┘
```

- In addition to the auxiliary pattern discussed here, Arregi (2000) discusses a small set of verbs that do have simple present and past tense forms (alongside periphrastic aspectual forms).

- Observing that these have *default* aspectual values, Arregi proposes that they optionally lack an Asp⁰ projection, allowing V⁰ to directly compose with T⁰

- In the framework adopted here, this can be straightforwardly replaced by the assumption that these verbs are exceptionally able to select an Asp⁰ with unspecified feature values. In such configurations T⁰ is able to Agree directly with V⁰.

5.3   Finnish

As (29), repeated from (3), shows, Finnish uses the auxiliary *olla* 'to be' to form the perfect, just as many familiar Indo-European languages do.
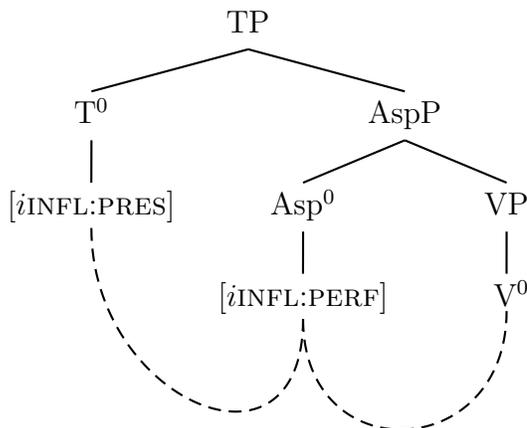
(29)   a.   Lapset   **ovat**   syö-neet kakku.
            The.children be.PRES eat-PTCP the.cake
            "The children have eaten the cake."
       b.   Lapset   **olivat** syö-neet kakku.
            The.children be.PAST eat-PTCP the.cake
            "The children had eaten the cake."

- This pattern can be accounted for if Finnish, like English but unlike Basque, has visible feature specifications for all values of T⁰, but only for perfect values of Asp⁰.

Unspecified (∴ non-visible) values: imperfective Asp⁰

Head movement: none.

(30) **ovat syö-neet** (Present Perfect)
be.PRES eat-PTCP

$$\text{TP}$$

Tree diagram:
TP branches to T⁰ and AspP.
T⁰ dominates [iINFL:PRES].
AspP branches to Asp⁰ and VP.
Asp⁰ dominates [iINFL:PERF].
VP dominates V⁰.

6 Implications: reduced relative clauses

So far we have seen that the proposed system of verbal inflection provides a unified account of where auxiliaries occur in both overflow and additive contexts.

In this section we will see that it also straightforwardly predicts a well-known generalization concerning the possible **absence** of auxiliaries.

Reduced relatives and (the absence of) *be*:

- The rule traditionally called *Whiz*-deletion in English creates reduced relative clauses. As its name suggests, *Whiz*-deletion is possible only with the verb *be*, not with other auxiliaries (i.e. *have*):

  (31)   a.   The cake eaten by the children
         b.   The children eating the cake
         c. *The children eaten the cake

- This generalization has been extended beyond English: we find that reduced relatives can be formed from counterparts of (31c) in languages where the perfect auxiliary is (or can be) a form of BE, but not where it is HAVE (Bulganian, Italian, Slovenian, Spanish[15]: Iatridou et al., 2003; Krause, 2001; Marvin, 2002)

- On a syntactic account of BE's distribution, the lack of an auxiliary in (31a-b) is arbitrary: additional machinery is needed to explain why BE does not occur (while the semantics of the progressive or passive remain intact).

A natural account:

- Reduced relatives are environments that appear to *lack* full clausal structure – particularly T⁰ (Williams, 1975, et seq.).

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[15]Spanish, a language with uniform HAVE-perfects, forms an apparent exception to this generalization, as perfect reduced relatives can be formed with unaccusative verbs. The participle in such cases shows subject agreement not found in a full clausal perfect, however (Iatridou et al., 2003), indicating that a different structure may underly such constructions.

- If BE is triggered only by the presence of stranded features, this is **exactly** the environment in which we would **expect** no auxiliary to occur: the semantics of aspect or voice are provided by Asp^0 or $Voice^0$, but the absence of T^0 means that no tense features are stranded.

The absence of reduced relatives with *have*:

- Following Freeze (1992) and Kayne (1993), I assume that non-*be* auxiliaries – specifically *have* – involve *additional material* in the position that would otherwise be realized as *be*.

  ○ stranded $[\text{INFL} : F] \longrightarrow$ BE

  ○ stranded $[\text{INFL} : F] + X \longrightarrow$ HAVE

- The lack of non-*be* reduced relatives suggests that this additional material X requires licensing or realization by some $[\text{INFL} : F]$.

- Note that reduced relatives with an uninflected V^0 are likewise impossible, suggesting that V^0, like the element X, requires inflectional licensing: **[The children eat the cake] are happy*

7   Conclusion

- This talk has outlined an approach to auxiliaries that claims they are morphological realizations of "stranded" inflection.

- This **unified** two superficially very different patterns of auxiliary use: the **additive** pattern of languages like English, Basque, and Finnish, and the **overflow** pattern of languages like Kinande, Latin, and Arabic.

- If generally successful, this approach turns auxiliary constructions into a structural **diagnostic** that can illuminate properties of the inflectional domain of the clause.

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