The Crosslinguistic Defaultness of *be*

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1. Introduction

There is a long-standing intuition in linguistic analysis that auxiliaries such as BE are in some sense default verbs. In this paper I present a formalization of this intuition: auxiliary BE is not present in the syntax, but is instead a morphological strategy for realizing "stranded" inflectional features.

This approach provides a unified analysis of previously-undiscussed variation in the distribution of auxiliary constructions. In this paper we will see the system applied to superficially very different auxiliary distributions in English, Kinande (Bantu), and Latin. The patterns of the Kinande and Latin types, previously largely undiscussed, will be of particular interest, demonstrating the need for a default approach to auxiliary verbs.

2. Variation in Auxiliary Use

English exhibits a familiar pattern of auxiliary use, in which categories that occur with an auxiliary *always* occur with an auxiliary (at least in full clausal contexts). If two auxiliary-taking categories co-occur, two auxiliaries appear, as in the progressive passive in (1c):[1]

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

Latin and Kinande exhibit a very different pattern of auxiliary use, in which individual inflectional categories have synthetic forms, but certain combinations of categories require an auxiliary.[2]

In Kinande, (past) tense and aspect (progressive, incompletive, or inceptive) can both be expressed synthetically in isolation (2a-b), but require an auxiliary in combination (2c):[3]

(2) a. tu-nému-húma
        1PL-PROG-hit
        'We are hitting'
    b. tw-á-húma
        1PL-PAST-hit
        'We hit (recently, not today)'
    c. **tw-á-bya**   i-tu-nému-húma
        1PL-PAST-be LNK-1PL-PROG-hit
        'We were (recently, not today) hitting.'

In Latin, similarly, passive and perfect categories require an auxiliary *only* in combination (Embick, 2000).

(3) a. amavi
        love.1SG.PERF

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[1]This pattern is widely attested outside English: it is found in Romance languages, other Germanic languages, Basque, Finnish, Hindi, and many others.

[2]This pattern is widely attested in Bantu languages, as well as in Ancient Greek, Russian, Arabic, and many other languages.

[3]In addition to a several-way contrast among aspectual forms, Kinande (like related Bantu languages) has a complex system of past tenses, varying in remoteness. The examples in this paper all involve the *recent non-hodiernal past*, which expresses a recent past that is nonetheless earlier than today.

'I loved, I have loved.'
b.   amor
    love.1SG.PASS
    'I am loved.'
c.   amatus   **sum**
    love.PERF.PASS be.1SG.PRES
    'I was loved, I have been loved.'

Despite the apparent differences between the English pattern on the one hand and the Latin and Kinande patterns on the other, this paper argues that it is possible to provide a unified analysis for both, once we assume that auxiliary verbs realize "stranded" verbal inflection, rather than being subcategorized for by particular syntactic environments.

While it is natural to assume on the basis of languages like English that some languages arbitrarily associate certain inflectional categories with syntactically-represented auxiliaries heading AuxP, this approach would be problematic for languages like Latin and Kinande, where no *single* category is correlated with the presence of an auxiliary. In Latin and Kinande, a syntactic licensing account of AuxP would look something like the following:

(4) a.   * [AuxP [XP]]
    b.   * [AuxP [YP]]
    c.   ✓ [AuxP [XP [YP]]]

The subcategorization relationship in (4c) is impossible if heads can subcategorize only for their immediate complement, as is widely assumed. This presents a direct challenge for any syntactic approach to auxiliary patterns of the Latin and Kinande type.

This paper sketches an alternative approach to auxiliaries that does not encounter this difficulty. I argue that combinations of inflectional categories in languages like Latin and Kinande give rise to auxiliaries because these involve more complex structures. Greater complexity makes it more difficult for inflectional features to combine with a lexical verb; when features are unable to combine with the verb they are *stranded*. Auxiliaries are inserted in a post-syntactic morphological component (I adopt Distributed Morphology: Halle & Marantz, 1993, 1994; Harley & Noyer, 1999) to realize these stranded inflectional features.[4] Section 3 describes the proposed system in more detail.

3. The System

As just stated, languages like Latin and Kinande provide evidence in favour of the view that auxiliaries occur to realize inflection that was unable, for some reason, to be realized on the main verb. This section develops an analysis of verbal inflection that allows the Latin and Kinande pattern to be unified with the pattern familiar from English. The proposed model of verbal inflection has three basic components: the uncontroversial idea that inflectional material is introduced in a separate position from a lexical verb; the possibility that inflectional material may fail to combine with a verb; and a morphological mechanism for realizing these stranded features with a default verb – i.e. BE.

Implementing the first of these components, I assume that verbal inflection is represented syntactically as inflectional features that are introduced on functional heads (Asp^0, T^0, etc.). These features combine with the verb via Agree (Chomsky, 1998).

Inflectional features may *fail* to combine with the verb, however, when a functional head is not local to V^0. I propose that this locality restriction is due to Relativized Minimality (Rizzi, 1990, et seq.): if all inflectional features are merely possible values of a single feature type (Adger, 2003, a.o.), then an inflectional head such as X^0 in (5) will not be able to Agree with V^0 across an intervening inflectionally-specified head Y^0.[5]

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[4]Space prevents these considerations from being discussed at greater length; the reader is referred to Bjorkman (2011) for further arguments against a syntactic approach to auxiliaries in Latin, Kinande, and similar languages. Proposals in a similar spirit can be found in Dik (1983), Dechaine (1993, 1995), Schütze (2003) and Cowper (2010).

[5]The view that inflectional features are introduced higher than V^0 requires adopting a formulation of Agree in which feature values can be passed downward: much recent work has proposed such a view of Agree, including

(5)

XP

X^0 YP

X^0 → [iINFL : x]

Y^0 VP

Y^0 → [uINFL : _] [iINFL : y]

V^0

V^0 → [uINFL : _]

Taken alone, this locality restriction would predict that verbs could Agree only with the lowest functional projection in the clause. The strict locality of Agree can be (apparently) overcome, however, in one of two ways. First, if the intervening head Y^0 in a structure such as (5) is not specified for inflectional features (because its features are *default/unmarked*), the head will not be visible for Agree and will thus be "skippable", as in (6a).[6]

(6)   a.

XP

X^0 YP

X^0 → [iINFL : x]

Y^0 VP

Y^0 → —

V^0

V^0 → [uINFL : _]

b.

XP

X$^0_{[i\mathrm{INFL}:x]}$ YP

Y$^0_{[i\mathrm{INFL}:y]}$ – V^0 VP

t_{V^0}

Second, as illustrated in (6b), *head movement* may bring the verb into the domain of Agree with higher inflectional heads: just as languages differ in whether they exhibit V^0-to- T^0 or T^0-to- C^0, etc.), here we will see that they may vary in whether they exhibit more short distance head movement, between V^0 and functional projections such as Voice^0, Asp^0, and T^0. I assume that head movement, like phrasal movement, is dependent on a pre-existing Agree relationship.

Auxiliaries occur when morphologically interpreted inflectional features do not Agree with a head that contains a verb, as in (5). At the morphological interface, such stranded inflectional features trigger insertion of an empty V^0 node. Lacking lexical content, this empty V^0 is spelled out by an elsewhere verb: this least-marked verb, a verb with no properties other than its categorial specification, is BE.

Section 4 illustrates how the two points of variation in this system – the distribution of head movement, and the features a language identifies as default – account for the patterns of auxiliary use in English, Kinande, and Latin.

Baker (2008), Zeijlstra (2010), and Wurmbrand (2011). This departs sharply from the original definition of Agree in Chomsky (1998), in which feature values could only be passed upward.

[6]The identification of some inflectional features as marked or unmarked is well established (Jakobson, 1939; Greenberg, 1966; Comrie, 1976; Dahl, 1985; Olsen, 1997).
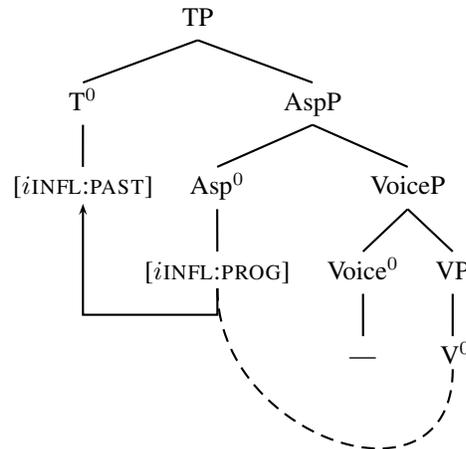
4. Illustration

4.1. Auxiliaries in English

Let us begin with the familiar pattern of auxiliary use in English. The sequence of relevant functional projections in English is $T^0 \gg Asp^0 \gg Voice^0$. To account for English auxiliaries – in which progressive and passive categories always occur with an auxiliary – all that is necessary is to propose that V^0 remains *in situ* in all environments, as widely assumed since Emonds (1978), and that non-progressive Asp^0 and active $Voice^0$ are featurally unspecified and therefore non-visible to Agree.

To account for the position of tensed auxiliaries in English, I propose that Asp^0 and $Voice^0$ both move to T^0. This movement does not play a role in determining the contexts in which auxiliaries appear, however.

In the progressive, illustrated in (7a), T^0 and Asp^0 will have specified inflectional features. Because there are no specified features on $Voice^0$, it does not intervene between Asp^0 and V^0 for the purposes of inflectional Agree. V^0 remains *in situ*, however, and so Asp^0 does intervene between T^0 and V^0. T^0 Agrees with Asp^0. The [INFL:PAST] features are stranded, triggering post-syntactic morphological insertion of *were*.

The passive derivation in (7b) proceeds in much the same fashion. Being featurally unspecified, non-progressive Asp^0 is non-visible for purposes of inflectional Agree. $Voice^0$ and V^0 Agree for [INFL:PASS] features. $Voice^0$ intervenes between T^0 and V^0, however, and so once again [INFL:PAST] features are stranded, resulting in the insertion of an auxiliary *be*.
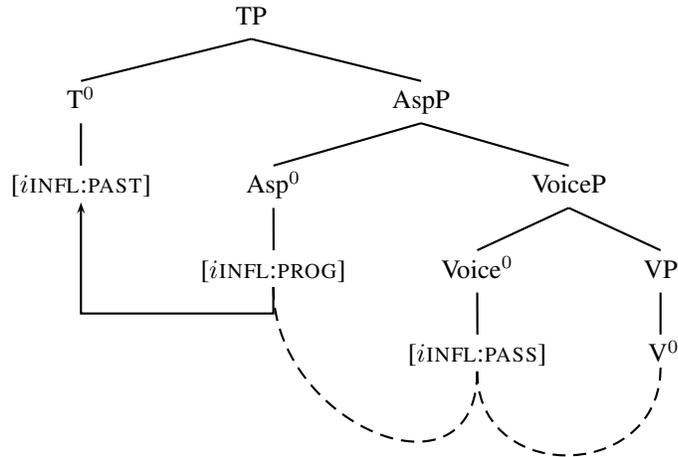
(7) a. were eating (Progressive)   b. was eaten (Passive)
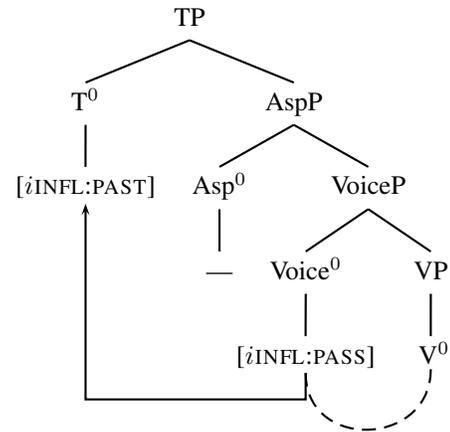
Two auxiliaries occur in the progressive passive because two heads end the derivation with stranded inflectional features, as illustrated in (8). In this tree, both $Voice^0$ and Asp^0 have specified inflectional features, and thus both are visible for purposes of Agree. $Voice^0$ is able to Agree with V^0. Asp^0 Agrees with $Voice^0$, while T^0 Agrees with Asp^0; as a result, both [INFL:PAST] and [INFL:PROG] features are stranded, resulting in the insertion of two auxiliaries:
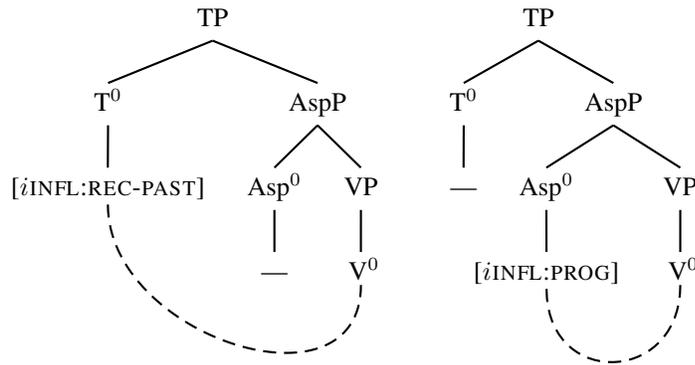
(8)   was being eaten (Progressive Passive)

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                          TP
                 _____/  _____
               T⁰                    AspP
               |              _____/    _____
         [iINFL:PAST]       Asp⁰               VoiceP
               ↑            |             ____/     \____
               |      [iINFL:PROG]     Voice⁰           VP
               |_____|            |               |
                                  [iINFL:PASS]          V⁰
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On this account, two factors contribute to the pattern of auxiliary occurrence in English. The first is the fact that all finite clauses have specified inflectional features in T^0: there are no unspecified tense values. The second is that the main verb remains *in situ*. As a result, any additional inflectional specifications will always strand the features of T^0.

4.2. Auxiliaries in Kinande

The pattern of auxiliary use in Kinande can be accounted for if, as in English, we assume that V^0 always remains *in situ*,[7] and that both present tense and perfective aspect are unmarked, and therefore non-visible.[8]

In a past perfective or present progressive clause, as a result, only one syntactically active head is present in the structure: T^0 in the past perfective in (9a), and Asp^0 in the present progressive in (9b). In both cases the single visible inflectional head Agrees directly with V^0, and no stranded features result.

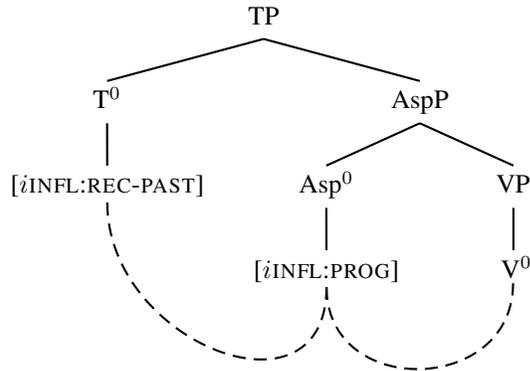(9)   a. Past: tw-á-húma 'we hit (recently)'   b. Progressive: tu-nému-húma 'we are hitting'

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          TP                                TP
      ___/  \___                        ___/  \___
    T⁰         AspP                    T⁰         AspP
    |        _/   \_                   |        _/   \_
[iINFL:REC-PAST] Asp⁰  VP              —      Asp⁰    VP
    |            |      |                       |      |
    |            —     V⁰              [iINFL:PROG]    V⁰
    |_____|                     |_____|
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In the past progressive in (10), by contrast, both T^0 and Asp^0 are specified for inflectional features. Asp^0 is able to Agree directly with V^0, but V^0 remains *in situ*. When T^0 seeks to establish an Agree relationship, it is prevented from targeting V^0 by the intervening Asp^0 head, due to Relativized Minimality. As a result, the [iINFL:REC-PAST] feature on T^0 is stranded, and is realized by an auxiliary.

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[7] The assumption that V^0 remains *in situ* is a simplification: it abstracts away from argument-structure-related layers of clause structure in the *v*P domain, which are highly active in Bantu and through which I assume the verb does move, following much previous work.

[8] The unmarkedness of present tense is supported as a cross-Bantu generalization by Nurse (2008).

(10)   Past Progressive: tw-á-bya i-tu-nému-húma 'we were (recently) hitting'

$$
\begin{array}{c}
\text{TP} \\
\diagup \quad \diagdown \\
\text{T}^0 \qquad \text{AspP} \\
| \qquad\qquad \diagup \quad \diagdown \\
[i\text{INFL:REC-PAST}] \quad \text{Asp}^0 \qquad \text{VP} \\
\qquad | \qquad\quad | \\
\qquad [i\text{INFL:PROG}] \quad \text{V}^0
\end{array}
$$

The contrast between English and Kinande, in terms of their auxiliary patterns, does not arise from any radical structural contrast between the inflectional systems of the two languages. Instead it arises from differences in the feature values each language chooses to specify.

4.3. Auxiliaries in Latin

The pattern of auxiliary use in Latin resembles that of Kinande, in that auxiliaries occur only in certain *combinations* of inflectional categories, not when those categories occur in isolation. It is more complex, however, in that it involves more inflectional categories: not merely tense and aspect, but voice as well.

In Latin, recall, both the perfect and the passive have simple forms (regardless of tense), but the perfect passive requires an auxiliary followed by a participle.
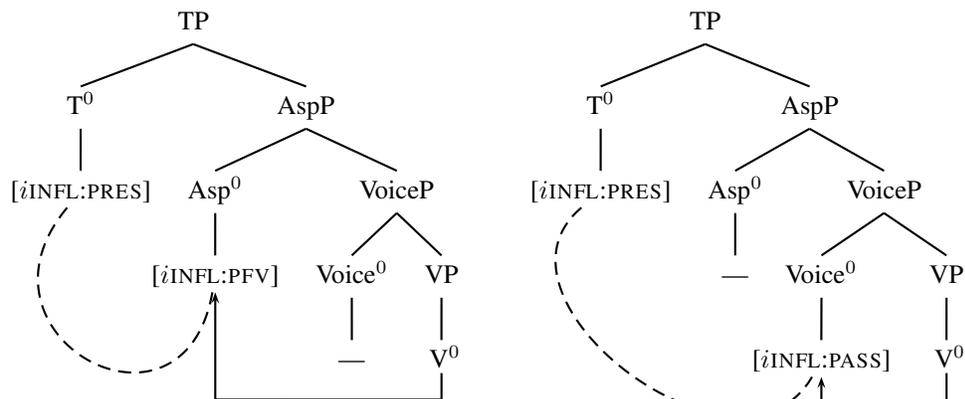
To account for this pattern, I propose first of all that both imperfective Asp^0 and active Voice^0 are unspecified, and thus non-visible for Agree. It is only when both heads have specified values – perfective and passive, respectively – that they interact to produce an auxiliary pattern.

The fact that the simple perfect and simple passive shows inflection for tense as well as for aspect or voice requires that V^0 moves to Voice^0 or Asp^0 whenever either of those heads Agrees directly with the verb. If V^0 remained *in situ*, the features on T^0 would be stranded (as they are in the English progressive and passive).

The structures in (11a) and (11b) illustrate the derivation of the present perfect and present passive:

(11)   a. Perfect: amavi 'I (have) loved.'   b. Passive: amor 'I am loved'

$$
\begin{array}{c}
\text{TP} \\
\diagup \quad \diagdown \\
\text{T}^0 \qquad \text{AspP} \\
| \qquad\qquad \diagup \quad \diagdown \\
[i\text{INFL:PRES}] \quad \text{Asp}^0 \qquad \text{VoiceP} \\
\qquad | \qquad\quad \diagup \;\diagdown \\
\qquad [i\text{INFL:PFV}] \; \text{Voice}^0 \; \text{VP} \\
\qquad\qquad\quad | \qquad\quad | \\
\qquad\qquad\quad — \qquad\quad \text{V}^0
\end{array}
\qquad
\begin{array}{c}
\text{TP} \\
\diagup \quad \diagdown \\
\text{T}^0 \qquad \text{AspP} \\
| \qquad\qquad \diagup \quad \diagdown \\
[i\text{INFL:PRES}] \quad \text{Asp}^0 \qquad \text{VoiceP} \\
\qquad | \qquad\quad \diagup \;\diagdown \\
\qquad — \qquad \text{Voice}^0 \; \text{VP} \\
\qquad\qquad\qquad | \qquad\quad | \\
\qquad\qquad [i\text{INFL:PASS}] \; \text{V}^0
\end{array}
$$

In the present perfect in (11a) Asp^0 agrees with V^0 across the unspecified (and hence non-visible) Voice^0, and V^0 raises to Asp^0 on the basis of that Agree relation. Because the verb raised, T^0 is able to agree directly with the Asp^0-V^0 complex. Similarly in the present passive in (11b), Voice^0 agrees with V^0, V^0 raises to Voice^0, and both are accessible to Agree with T^0.

To account for the auxiliary in the perfect passive, all that is necessary is to assume that Latin lacks head movement between Voice^0 and Asp^0 themselves. This becomes relevant only when both are inflectionally specified.

In the perfect passive, the lowest inflectional head, Voice^0, is able to Agree with V^0; as in the simple passive, V^0 raises to Voice^0. Asp^0 is then able to Agree with V^0 in its raised position in Voice^0, so its [INFL:PFV] features are not stranded.

By assumption, however, Agreement between Asp^0 and Voice^0 is *not* accompanied by movement. As a result, V^0 remains in Voice^0. When T^0 establishes an Agree relation, it will Agree with Asp^0, being prevented by relativized minimality from Agreeing directly with V^0. As a result, the [INFL:PRES] feature on T^0 is stranded, leading to its being realized by a form of *esse* (BE).

(12)   Perfect Passive: amatus sum 'I was/have been loved'
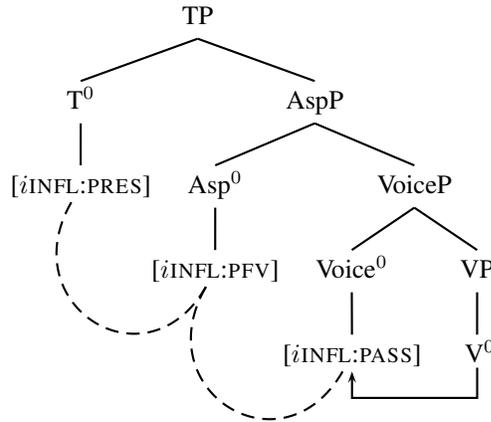
The appearance of the auxiliary in the perfect passive hinges on the lack of movement between Voice^0 and Asp^0, though its absence is relevant only when both heads are visible for Agree (i.e. when both are specified for inflectional features). If there were movement between these two positions, then T^0 would be able to Agree directly with the verb in Asp^0, and there would be no stranded features and thus no auxiliary.[9]

5. Implications: Reduced Relative Clauses

The analysis of auxiliary BE presented here has implications for the analysis of reduced relative clauses. In English, reduced relative clause formation is traditionally referred to as *Whiz*-deletion. As its name suggests, *Whiz*-deletion involves the deletion of a relative pronoun and (following) *be*; it is impossible with non-*be* auxiliaries.

(13)   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. Looking at perfect construction,s Iatridou et al. (2003) observe that in at least some languages with auxiliary selection (alternation between *be* and *have* in the perfect), only verbs that take auxiliary *be* allow reduced relative formation.

On the present analysis, in which *be* is simply the realization of stranded inflectional features, this is exactly an environment in which we would expect no auxiliary to appear: if reduced relatives lack higher inflectional structure (as in Williams, 1975, et seq.), then there is no source for the stranded features *be* would realize.

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[9]Embick (2000) proposes a similar analysis of Latin, but assumes that tense inflection is stranded whenever the verb fails to move all the way to T^0 (as opposed to when the verb is simply not available for direct Agreement with T^0). This requires Embick to frame a very complex condition on verb movement from Asp^0 to T^0, in which the movement is prevented only when the verb has *both* perfective *and* passive features. Moreover, the assumption that auxiliaries arise in Latin when *head movement* fails eliminates the possibility of unifying the account of a language like Latin with accounts of English, where the verb is assumed to remain in a very low position (the same is true of a language like Kinande).

If we assume that non-*be* auxiliaries – specifically *have* – involve additional material in the position that would otherwise be realized as *be* (Freeze, 1992; Kayne, 1993), we can account for the lack of non-*be* reduced relatives by assuming that these additional features require licensing or realization independently.

By contrast, were auxiliaries such as *be* to occupy AuxP, the special character of *be* with respect to reduced relatives would be comparatively arbitrary.

6. Conclusion

This paper has outlined an approach to auxiliaries in which they are morphological realizations of stranded inflectional features: when inflectional features occur in a position that does not contain a verb, the morphological component is able to insert a totally default verb (BE) to "rescue" the stranded features.

The advantage of this approach is that it is able to *unify* superficially very different patterns of auxiliary use: on the one hand, the auxiliary pattern in English, where certain categories always occur with an auxiliary verb, and on the other hand, the auxiliary pattern in Kinande or Latin, where auxiliaries occur only in *combinations* of inflectional categories.

Proposing that auxiliaries occur to realize inflection that failed to combine with the main verb relies upon a model of verbal inflection in which this is possible. The model adopted here is one in which verbal inflection is manipulated via Agree, and that Agree is subject to a locality constraint and cannot be established across an intervening inflectional head. This is a proposal of strong cross-linguistic uniformity, and it contrasts with the traditional view that languages differ considerably in how they manipulate verbal inflection (e.g. V^0-to-T^0 head movement vs. Lowering, Pollock, 1989, a.o.). I have attributed variation among languages – particularly variation in auxiliary patterns – to two sources: the distribution of specified ('marked') inflectional features in a language, and the instances of head movement it allows in the inflectional domain. The auxiliary patterns of English, Kinande, and Latin result from differences in these two respects.

Implications of this view were shown in one specific domain, that of reduced relative clauses. I argued that the failure of a BE auxiliary to appear in such environments follows straightforwardly on the current account: if a structure lacks higher inflectional projections, it will also lack strandable inflectional features, and no auxiliary will be called for. Minimally extending the approach to BE to another auxiliary, HAVE, moreover, suggests a reason why auxiliary HAVE *cannot* be ommitted in reduced relative clauses.

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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