Checking features and split signs[*]

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Abstract

Serial and quasi-serial constructions pose an interesting problem for Checking Theory, as the inflectional morphology relating to Tense may appear on two verbal heads. We argue that a head may occur as a 'split sign', with its LF-interpretable and PF-interpretable parts merged at different positions in a derivation. The PF-interpretable part determines the morphology on V, the LF-interpretable part determines the appropriate interpretation. We show that Tense must check one or more accessible Infl heads: that is, checking is not essentially one to one, and the parts of a split sign are subject to checking in a configuration which may be non-local.

1 Introduction

We begin by offering some preliminary motivation for 'split signs', and presenting our analysis of serial and quasi-serial constructions. This is based on a treatment of functional heads as syntactic and semantic one- or two-place operators. The main argument is in section 3, where we argue for a set of Infl heads for English whose PF-interpretable content determines verbal inflection. Heads such as Tense and Aux, which select for a verb phrase, are required to be in specified checking relations with a specified Infl. The LF-interpretable part of these heads may have substantive content (as in the case of the Progressive), or it may be trivial (as in the case of the Perfective). We use this distinction to explain the distribution of quasi-serials in English, and we generalise the analysis to serialising languages. Section 4 discusses how and why Checking theory must be changed to accommodate the data, arguing that the required checking configuration is scope, where scope is determined by selection. Section 5 discusses parametrisation, and section 6 reiterates our conclusions.

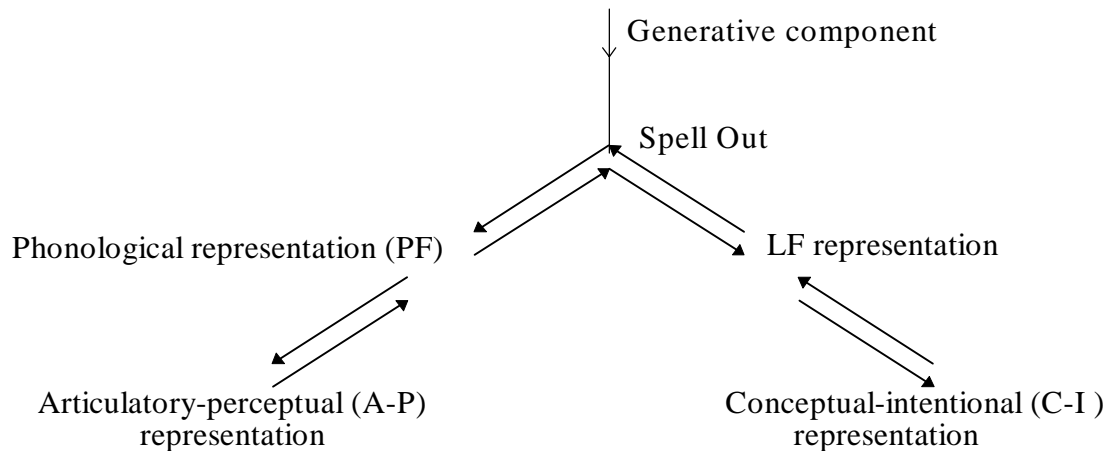 Our point of departure is the contrast between the grammatical and ungrammatical

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'quasi-serial' structures in (1).

(1) a   John has just run and bought a newspaper
      b * The newspaper has just been run and bought

In order to provide a principled account of this distinction, we presuppose some version of Minimalism, and then make two inter-related theoretical claims. We assume a Minimalist structure of the grammar which generates structures by Merge (and perhaps Move). These structures are separated into PF- and LF-interpretable parts at the point Spell Out, as in (2), after Cormack and Smith (1996: 244), by a process we refer to as Separation. Our two main theoretical claims are as follows. First, we argue on the basis of serial and quasi-serial structures that a lexical item does not necessarily appear at Spell Out as a Saussurian sign (i.e. including both PF- and LF-interpretable information), but that it is possible for the morphophonological (PF-interpretable) and the semantic (LF-interpretable) parts of a category to be realised, and indeed merged, in different places on a tree, as what we call a 'split sign'.

(2)

Generative component

Spell Out

Phonological representation (PF)

LF representation

Articulatory-perceptual (A-P)
representation

Conceptual-intentional (C-I)
representation

   Second, we claim that the proper relation between the morphophonological and semantic components of the sign is ensured through checking. In particular, we argue (*contra* Chomsky 1993) that checking may and often must be 'at a distance', rather than in the standard checking configurations involving local adjunct-head or spec-head

configurations, and that the checking head need not be functional. We further argue that there is no additional LF-movement, nor additional PF-movement, though morphological realisation after Separation may apparently reorder morphemes.

To give our suggestions about split signs some initial plausibility we begin with an example of VP ellipsis. Consider (3):

(3) a %　　Mary [lost her temper] yesterday, and John will [$_{VP}$ *e*] today
　　 b %　　First every girl [lost her temper], and then every boy did [$_{VP}$ *e*]

We are concerned here with the dialect of those speakers (not including ourselves) for whom the sentences in (3) are grammatical. We assume that the PF-null VP of the second clause obtains its LF interpretation by matching with the LF of the VP of the first clause. As we see from (3b), the possessive pronoun is a bound-variable pronoun.

In order to obtain the only rational reading, where John does not lose the temper of some female, but loses his own temper, we claim that the φ-features of the bound-variable pronoun must be SPLIT. Attached to the pronoun, there is PF- but not LF-φ-feature information. A simplified representation of the first clause will be as in (4) below, where the LF content of the split signs is shown in capitals and the PF content in italics. The semantic (LF interpretable) information relating to the φ-features is located only at the subject (i.e. at D or AGR relating to the subject), which is outside the VP, as partially shown in (4). This allows the LF interpretation of $_{VP}$[*e*] to exclude spurious gender information.[1,2] Since bound-variable pronouns may be embedded indefinitely far away from their antecedents, an account in terms of LF-movement seems implausible.

Somewhat similarly, the LF interpretation of $_{VP}$[*e*] in (3) must have no semantic tense content: the morphology relating to tense on the verb in the first clause must be due solely to a PF feature. Its semantic counterpart must appear outside the VP, at some Tense-related node, as in (4). A checking relation must hold between the PF and LF parts of such split items.

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[1]To account for our 'strict' dialect, we assume that the lexical entry for a bound variable pronoun intrinsically includes gender.

[2]Strictly speaking, the matching of VPs is at a level where reference assignment and other resolutions of semantic under-determination have been made. Even the strict dialect allows the dialogue 'A: *You have dropped your hanky*. B: *So I have* e'; here, *You* in A's remark and *I* in B's have the same referent.

(4)   Mary**[FEM]** [$_{TP}$**[PAST]** [$_{VP}$ lose**[*past*]** [$_{DNP}$ poss-bound-pronoun**[*fem*]** temper]]]

The empty VP of the second clause will have as its meaning the LF-interpretable part of the VP in (4): strip off the PF information in italics. We are not concerned with just what goes on in the second clause, but with the checking relations needed in the first clause. If T were amalgamated with V at LF, as suggested by Chomsky (1995: 195), then the explanation for the 'sloppy' deletion of the verbal inflection is lost.[3] As regards the pronoun, to require that the checking be done in one of the standard checking configurations (i.e. adjunct-head or spec-head) would be perverse: the required configuration is just that which licenses bound variable pronouns in the first place i.e. c-command, or semantic scope. We suggest that some more precise form of this is the correct configuration for ALL checking, including the checking relating the Tense content [PAST] to its morphophonological reflex [*past*] on the verb. More evidence will appear.
  An instance of a lexical, rather than of a functional split sign is suggested by head movement. Suppose that a verb has 'moved' from V to C. We can characterise this as movement of just the PF part of the V sign, since the semantic interpretation must be *in situ*. Alternatively, let the strong V-feature of C be interpreted as a requirement for PF V-content, (as suggested by Roberts and Roussou (1997)), while the selection by T for V is solely for LF V-content.[4] This would allow the two parts of the V sign to be generated apart during merge, as in (5). The PF and LF parts of V are properly associated by checking.

(5)   Who C[$_V$ ***do***[*past*]] Bill T[PAST] [$_{VP}$ [$_V$ **DO**] see *t*]?

This proposal eliminates head movement. Further, under this form of checking, there is no need for variables, i.e. traces.

2 Background

In the work we did on checking theory in relation to serial and quasi-serial constructions,

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[3]See Lasnik (1995) for discussion, and footnote 44 for an explanation as to why ellipsis of VP-*ing* is impossible in examples like *John ate earlier, but Mary is* [VP] *now*.

[4]'V to C movement' is discussed in more detail in section 5.

Cormack and Smith (1996), we argued that Tense was a 'split sign' head. That is, the LF-interpretable and PF-interpretable parts of the sign turn up in different positions in the structure, where the correct pairing is mediated by checking. We argued that there was no advantage, and considerable disadvantage, to the standard Minimalist assumption that the checking configuration was necessarily adjunct-head or spec-head. Instead, we argued for 'checking at a distance', under an appropriate configuration with Minimality restrictions. Here, we first show how this works for the English quasi-serial structures, and then show how the properties of Infl nodes can account for what was left as an unsolved problem in our earlier treatment. The unsolved problem was to offer an explanation of the different acceptability of quasi-serials, as shown in the difference between perfect and passive as in (1), or between tense and passive, as in (6).

(6) a   John ran and bought the paper
    b * The paper was run and bought

Our earlier arguments were based *inter alia* on the contrast between the examples in (6), as compared with the lack of contrast between the examples in (7).

(7) a   John ironed the shirt dry
    b   The shirt was ironed dry

Note that the ungrammaticality of (6b) is nothing to do with the putative unavailability of a passive of the verb *run*, as such a passive may appear in resultative serials like that of (8b).

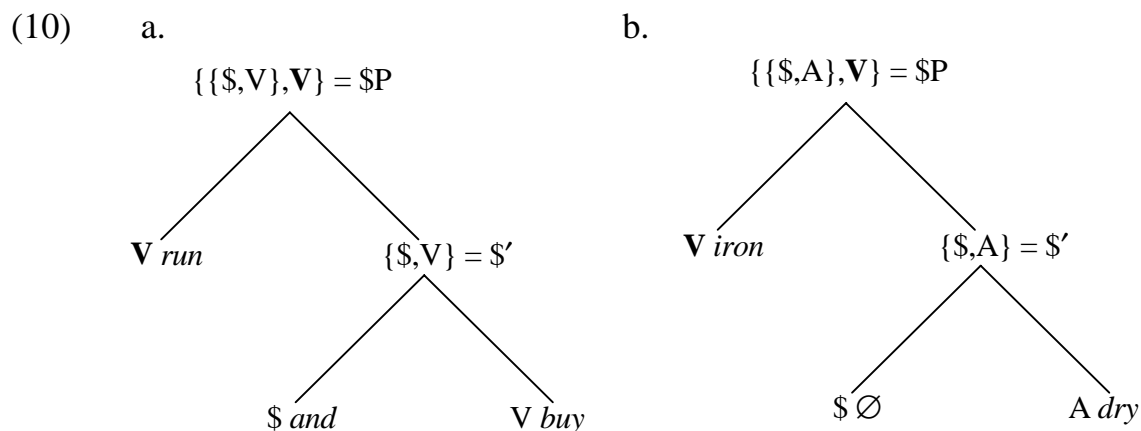(8) a   Greta ran her trainers bald
    b   The trainers were run bald

The serial nature of a sentence such as that in (6a) can be seen from the fact that it has the 'single activity' interpretation always found in serials. This is clear from the contrast with the distinctly odd (9), where the use of *both* forces a coordination interpretation rather than the required subordinating interpretation of *and*.

(9) John both ran and fetched a paper.

Other arguments can be found in Cormack and Smith 1994, which we assume here. Essentially, we argued that the two verbs, or the verb and adjective, of serial and resultative structures are merged as an asymmetric conjunction of the two heads, as in (10). The asymmetric conjunction head $ is realised overtly as *and* in English V-V serials, and as a phonologically null element in V-A serials. Whether overt or covert, $ is subject to the usual array of pragmatic interpretations of conjunction, giving rise to simultaneous, sequential or consequential readings.

  Apparent conjunction of a transitive and an intransitive is licensed just if the intransitive is unaccusative. The restriction to unaccusatives is well known for serial structures (see for instance Baker 1989). In our account, the unaccusatives are in fact transitives, assigning a vacuous semantic role to either subject or object.[5]
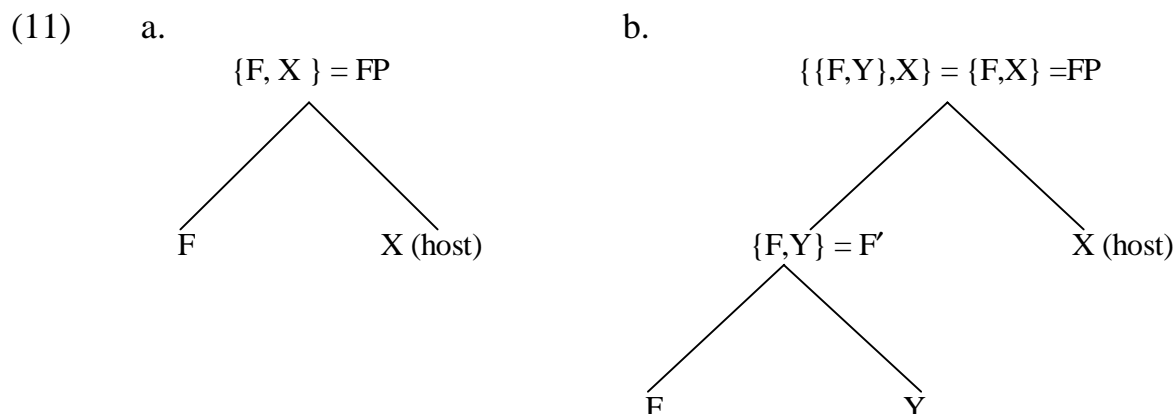
  The structures are based on the account of the projection of functional categories of Cormack and Breheny (1994), Cormack (1995), as in (11).

(10)   a.   b.

        {{\$,V\},**V**} = \$P   {{\$,A\},**V**} = \$P

      V *run*   {\$,V} = \$′   **V** *iron*   {\$,A} = \$′

              \$ *and*   V *buy*   \$ ∅   A *dry*

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[5]The transitive (unaccusative) version of intransitive *run* required is $\lambda x \lambda y(run'\,y)$; the transitive for an adjective such as *bald* is $\lambda x \lambda y(bald'\,x)$, where *run'* and *bald'* are the intransitive meanings. We give these the types $<nil,<e,t>>$ and $<e,<nil,t>>$ respectively. The latter is the type of a standard unaccusative, i.e. the 'real' role is assigned to the object position. The two operators deriving these types from the basic $<e,t>$ are semantically trivial in that they introduce no substantive content; they will not be shown in the syntactic representations. Because of the lack of substantive content, they are permitted inside \$P - see section 3.3.

(11)   a.   b.

{F, X } = FP   {{F,Y},X} = {F,X} =FP

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        /\                              /\
       /  \                            /  \
      F    X (host)          {F,Y} = F′      X (host)
                                  /\
                                 /  \
                                F    Y
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In (11a), we have a double-headed projection. The idea is that although the selection feature of the one-place operator F is satisfied when it is merged, and F projects as expected, because F is a functional head, the host category X is projected as well, to give the unordered pair {F, X}.[6] If X is a lexical projection, then the whole will be a lexical projection. In (11b), F is a two-place operator, selecting for Y and then for X. At F′, one selection is still unsatisfied, and F′ is still a functional projection. If X is lexical, FP, the highest node, will again be a lexical projection of the host X. The F in (11a), and the F′ in (11b) are what are usually described as adjuncts.

It will be important to note that a two-place operator head like F in (11b), has scope over each of its operands X and Y, and that neither of the operands has scope over the other. Similarly, $ in (10) has scope over the two lexical categories, neither of which has scope over the other. For the operands of a two-place operator, logical scope and c-command diverge; and it is logical scope (given by selection) which is the significant relation.[7]

A simple verb phrase will typically be constructed as follows. A determiner, which is a two place operator, selects its host operand to the right, so that it corresponds to F in (11b). In a verb-object structure, Y is the noun phrase, and X the verb. That is, an object

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[6]In a more detailed notation, the undischarged selection categories and the semantic type would be specified as well, as argued in Cormack (1995).

[7]Note that these proposals are not compatible with the word order proposals of Kayne (1994), but rather assume that order is determined by the directional selection properties of functional heads. This order may in fact be uniformly head-initial for English, as in (11), so that the trees in (10) are a simplification.

merges to the left of the verb. In order to get the surface order in (7a), the PF part of the host verb *ironed* is merged in some position X, where X is higher than the object, as indicated in (12a). The identity of X in the various cases need not concern us here.[8] Similarly, merging of the host verb's PF at a position higher than the object will account for typical VOV serial structures in classical serialising languages like that in (12b) from Nupe. For (6a), the PF of the whole $P, which is simply a complex V^0 category, is merged in the higher position, as in (13).[9] The double headed arrows indicate the PF-LF relation in each case.

(12)   a John ironed the shirt dry

John [$_{XP}$ [$_X$ PF-$_V$*ironed*] [$_{VP}$ [$_{D'}$ the shirt] [$_{\{V,\$\}}$ LF-$_V$IRONED [$_\$$ $\$\varnothing$ dry]]]]

↑_____↑

b Musa du eci gï

Musa cook yam eat

'Musa cooked and ate a yam'

Musa [$_{XP}$ [$_X$ PF-$_V$*du*] [$_{VP}$ [$_{D'}$ eci] [$_{\{V,\$\}}$ LF-$_V$DU [$_{\$'}$ $\$\varnothing$ $_V$gï]]]]

↑_____↑

(13)   John ran and bought a paper

John [$_{XP}$[$_X$PF-[$_{\{V,\$\}}$ *ran and bought*] [$_{VP}$ [a paper] LF-[$_{\{V,\$\}}$ RAN AND BOUGHT]]]]

↑_____↑

The analysis for quasi-serials we offered for contrasts such as those in (1), and in (6) and (7), was as follows: lexical heads like verbs and adjectives can be extracted from the

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[8]In some cases, X could be a Larsonian shell verb (Larson 1988a); in others, including Nupe, X is T. Other possibilities would be Johnson's μ (Johnson 1991), or Bowers' Pr (Bowers 1993). X must have a 'strong feature': see section 5.

[9]Note that it is possible to 'move' the PF part of the whole of a V-A $P, in the presence of a heavy object: *John ironed dry all the wet shirts*. This corresponds to the 'Light Predicate Raising' of Larson (1988 a, b). Note also that it is possible in principle to 'move' just the host V in a V-V $P, as in the following from the Trøndelag dialect of Norwegian (example from Tor Åfarli (p.c. 1996). See Åfarli and Creider (1987)).

Jon knekket noetter og spiste   'Jon cracked and ate nuts'

Jon cracked nuts and ate

Jon knekket $_i$ [$_{VP}$ noetter [$_{\$P}$ t_i og spiste]]

lexicon only with an attached morphophonological operator as a feature.[10] As a language particular fact, Adjectives in English, but not Verbs, are extracted with a default morphophonological operator, which adds no phonological material to the stem. The default operator by hypothesis needs no checking. Other morphophonological operators are the PF-interpretable reflexes of tense, aspect, passive, and so on, and must be in a checking relation with the LF-reflexes of these heads. The effects of this gave rise to the structures shown schematically in (14). We assumed a setting for each head of what Baker (1996: 7) calls 'micro-parameters', determining whether SINGLE or MULTIPLE checking was available.[11,12] Tense did (potentially) have multiple checking; Passive did not: correctly describing the distribution of grammatical and ungrammatical examples in (6) and (7), as indicated in (14).

(14)   a   Tense[**PAST**][$_{XP}$ [$_X$ $_V$*iron*[**past**]] [$_{VP}$ O [V IRON [$_S$∅ $_A$*dry*[**default**] DRY]]]]
       b   Infl[**PASS**]   [$_{XP}$ [$_X$ $_V$*iron*[**pass**]] [$_{VP}$ O [V IRON [$_S$∅ $_A$*dry*[**default**] DRY]]]]
       c   Tense[**PAST**][$_{XP}$ [$_X$ $_V$*run*[**past**] [$_S$*and* $_V$*buy*[**past**]]] [$_{VP}$O [RUN AND BUY]]]
       d   *Infl[**PASS**] [$_{XP}$ [$_X$ $_V$*run*[**pass**] [$_S$*and* $_V$*buy*[**pass**]]] [$_{VP}$O [RUN AND BUY]]]

The idea was that heads such as Tense and Passive were licensed to appear as 'split signs', i.e. with their LF and PF parts located in different places in the tree.[13] The proper relation between these parts was to be ensured by checking, under scope rather than under the normal adjunct-head configuration. At Separation, the LF-interpretable and PF-interpretable contents of the representation were directed to the C-I and A-P processing devices respectively.

   It was implicit in what we did that the LF position was the one from which

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[10]For arguments for a morphophonological interface between the lexicon and the computational device, see Cummins and Roberge (1994). For arguments as to the status of the feature, see Cormack and Smith (1996). Generally, we distinguish between morphemes and morphophonological operators by underlining the latter.

[11]The idea that parameters are to be associated with individual functional heads is due to Borer (1984).

[12]Collins (1995) uses single *vs.* multiple checking to distinguish serialising from non-serialising languages: however, he does not consider the English quasi-serials. Our terminology in Cormack and Smith (1996) was different (head-check vs. scope check).

[13]For arguments that passive is phrasal, see Bach (1980) and Keenan (1980).

interpretation took place, and that this could not 'move' in the course of a derivation. The LF position is the one at which the c-selection and s-selection properties must hold, so that the LF position of a sign is generally determined by such selection. Other properties of a sign such as its affixal status are PF properties; that is, they relate just to the PF-interpretable parts of a sign. The PF position of a sign, even if different from the LF position, was not seen as derived by movement, (though this is sometimes a handy metaphor),[14] but as merged where it is heard. Under this interpretation, checking relations substitute for movement chains, and there is no essential use of LF movement or any need for concomitant uninterpretable Formal Features (FF).

We now make the explicit claim that what is standardly seen as movement should be reinterpreted as the Merging of PF-forms at positions distinct from that of their LF counterparts.[15] Syntactic structure stripped of PF-interpretable forms should give the LF directly, and syntactic structure stripped of LF-interpretable forms should give the PF directly.[16] Although we think it is possible to generalise our proposals to quantified noun phrases, we will not have anything to say about the scope interpretations of these in this paper, but will confine our attention to 'head movement' structures. In the next section, we adduce these assumptions in the analysis of inflectional heads.

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[14]And under this metaphor, we would be re-claiming 'transformations preserve meaning' *c.f.* Partee (1971).

[15]The position that there is no LF movement has of course been argued for directly, and in particular by Brody (1995, and earlier papers). For a version which comes closer to what we are suggesting, see O'Neil and Groat (1995). We do not assume that it is checking that drives movement, so that there is no need to postulate LF-movement; and consequently there are no uninterpretable FF (which have nothing to do with LF-interpretable units). For related claims, see Roberts and Roussou (1997) and Holmberg (1997).

[16]Beard (1995;§15.4) suggests similarly that differences in positioning of the LF and PF portions of an item do not arise from movement in a derivation. However, he suggests that the PF positioning is determined during Spelling, and argues that the syntactic component contains no phonological material at all.

3 Inflectional heads

3.1 Inf heads and inflectional morphology

Consider a clause with several inflected heads, such as (15a). We take V[lex] to be the head of the phrase, with the Auxiliaries being optional functional heads (i.e. semantic operators). We are going to utilise Infl projections as shown informally in (15b).

(15)   a Rosa *might have been given* an armadillo.
         b T[PAST] Infl[-*ed*] Aux[*may*] Infl[-∅] Aux[*have*] Infl[-*en*] Aux[*be*] Infl[-*en*] V[lex]

We hypothesise that the inflection associated with a verb is due to the presence of a morphophonological operator which itself is the PF part of some other head (see Cormack and Smith (1996)). An auxiliary already has its own PF content, so the morphophonological operator must belong to some intervening head - an Infl head, by hypothesis.[17] The Infl heads following the Auxiliaries would in fact have been required by a theory such as that of Chomsky (1986), under which verbs rose to Infl to collect an inflectional affix.

   Note that contrary to what we had taken to be the case in our earlier foray into morphology, we are now assuming that there is an Infl head associated with Tense (previously, we took it that Tense was itself an Infl head). Independent (but theory internal) evidence of this is provided by the scope of negation with respect to a modal such as deontic *may*, which has a reading in which the LF position of *may* must be to the right of negation. PF-*may* must have some host, and since a temporal adverb may intervene between Tense and this landing site, we need a head between T and Neg.[18] We take this head to be an Infl associated with T.[19]

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[17]There is independent evidence for Infls associated with Auxiliary heads deriving from the 'movement' associated with Polarity negation and the possible positions for adverbs, but we do not have space to put that forward here. See Cormack and Smith (in preparation).

[18]We take it that temporal adverbs must be within the scope of T.

[19]Postulated Agr projections do not occur between T and Neg. Pollock (1989) argues for short verb movement to Agr lower than Neg. Chomsky (1995) has AgrO lower than Neg and AgrS higher than T. In chapter 4, Chomsky replaces the Agr projections by adjunction, which we reject.

(16)   Sue sometimes may not drink alcohol.
        'It is sometimes the case that it is not true that Sue may drink alcohol'
        Sue [$_T$PRES [sometimes [$_{Infl}$PF-***may*** [-*pres*] [$_{Neg}$not [LF-**MAY** [$_{VP}$ drink alcohol]]]]]]
                                    ↑_____↑

   The Infl-contents we have shown are just the PF-contents of each head. These are the morphophonological operators which select for, and hence must end up realised on, some [V] head (i.e. on a verb or auxiliary). We discuss the LF-contents of the Infls in a moment.

   We have assigned the various heads labelled 'Infl' to a single syntactic category so that a Relativised Minimality account (Rizzi 1990) is available for the fact that in English, a verb may not bear more than one of the inflections being considered (but may of course bear φ-features in addition to tense-morphology, so Agr if it exists is not an Infl).[20] We assume as before that the PF-content of a head may be realised at some position distinct from where the LF content is merged, and that the relation between the two contents of the 'split sign' must be ensured by checking.

   In a language where it is parametrically determined that the heads corresponding to English Infls belong to DISTINCT categories, a sequence such as that in (17) would give rise to a V[lex] with both morphophonological operators operating on it. An example is given in (18).

(17)   Infl$_1$[PAST] Infl$_2$[PASS] V[lex][*pass*] [*past*]

(18)   Tense[PAST] Mood[PASS] V[lex][*pass*][*past*]
        taaj-ïlïn-t-ta
        solve-[passive]-[past-3sg]
        'was solved' (Yakuts; from Spencer 1991)

The idea is that in (17), if the two Infls have the same category, minimality prevents the necessary checking from the position of Infl$_1$ to the position V where its PF-content is actually realised, since the category Infl$_2$ intervenes. If the heads are categorially distinct, as indicated in (18), complex inflections may result. Since in English by hypothesis all the Infls do have the same category, the presence of the intervening Aux heads is predicted to be necessary to achieve grammaticality.

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[20]The relation on which the Minimality is based will not be 'government' but 'selection'.

3.2 The LF content of Infl and Aux

Let us now consider the Infls in more detail, and in particular, their LF content. Consider for instance the progressive, *is leaving*, as in (19), which includes the semantic content PROG.

(19)   Aux[*be*]   Infl   V[lex] *leave* [-*ing*]

Is this PROG the LF content of the Aux, or is it the LF content of the associated Infl? Suppose it is the LF-content of the Aux. Then the Infl must have an LF content which has no semantic effect.[21] A suitable content is given by the identity operator ID = λX X (of type $<t,t>$, assuming that composition of functions is available for functional heads). If it is the Infl which has the substantive PROG content, then the simplest hypothesis is that the LF content of the Aux is this trivial identity operator ID. The same question arises with regard to the passive: is PASS the LF content of the *be* that introduces the passive verb, or is PASS the LF content of the associated Infl[-*en*]?

   We need to consider the LF content of the range of Infls postulated. We take it for granted that the tense content is at T, and that the associated Infl must have ID for its LF content.[22] Similarly, with a head such as the modal *can*, selecting for Infl, it is intuitively clear that the substantive semantic content is given by the Aux. Again, it is the associated Infl which has semantic content [ID]. An Infl with only trivial LF content could not turn up usefully as the head of a modifier, and will not turn up at all unless required for syntactic reasons.[23] For the non-finite forms, we argue that there is sufficient evidence available for the learner to establish that the Infls introducing passive and present participles, but no other inflections of the verb, have non-trivial content.

   One relevant kind of data is the range of inflectional forms with the expected meanings

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[21]We assume that every item in the lexicon has both PF and LF content. Apparently PF-empty categories such as 'pro' or some $ have null phonology ∅, while apparently LF-empty categories typically have identity content λX X. (There may be more type-complexity e.g. for an expletive).

[22]In Cormack and Smith (1996) we show that, as one would expect from the similar situation with serials (Baker 1989), Tense cannot be inside a quasi-serial $P.

[23]We expect a similar restriction on Aux [ID]. Generally, these will only occur when required for syntactic reasons.

which are available in the absence of a supporting Aux.[24] The data come in two varieties: non-finite complements (selected by a lexical head), and verbal or deverbal modifiers (which are selected only by $, which itself can licence no inflectional features). For the non-finite complements, the possibilities in English are infinitives with *to*, bare infinitives, *-en*P, and *-ing*P, as exemplified in (20) to (23). Notably absent is any head selecting for an *-ed*P. As modifiers, we find infinitives with *to*, *-en*P, and *-ing*P only, as indicated in (24).[25]

(20)   a Shelley hopes *to leave*
       b Viola forced William *to leave*

(21)   a Gerald saw/made the kitten *jump*
       b The teacher had the students *leave* early

(22)   The lecturer had the essays *marked/found* (by an assistant)

(23)   Marcia began/tried *wearing* a hat

(24)   a The [man [*standing* outside]]
       b The [man [*chased* by a bear]]
       c The [man [*to mend* the sink]]
       d The [man *[eaten the cake]]
       e The [man *[go]]

   We consider first the infinitivals. Following Pullum (1982) and Warner (1993), we take infinitival *to* to be an auxiliary verb. We further assume that (perhaps in consequence of its origin as a preposition), it falls within the domain of [default] inflection. This explains why the [$_{AUX}$ *to*] in (24c) bears no visible inflection.
   In (21), we appear to have infinitives without the *to* auxiliary. As is well-known, the passives of examples like (21a), typically with perception verbs, do have an overt *to*; we assume that there is a covert auxiliary in the active sentences. The *to* was present in the

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[24]This is not an original claim: see for example, Warner (1993: 75).

[25]We discuss and reject Bresnan's (1995) argument that there are past participial modifiers in Cormack and Smith (1997).

active in earlier stages of English, as we see in (25a). Examples like (25b) are still acceptable, even if mannered. An overt *to* was also present in examples like (21b), as exemplified in (25c). Examples (25) a and c are from OED2 (1994).

(25) a This was the first time that ever I saw her to wear spots (1665; Pepys)
      b She saw it to be a large house
      c What would your Grace haue me to do in this? (1591; Shakespeare)

We assume for (21b) too, then, that there is a phonologically null auxiliary present. If every infinitival verb is selected by [$_{AUX}$ *to*], then we take this evidence to justify the claim that the infinitival form of the verb cannot occur without an auxiliary; and hence that the LF content of an infinitival phrase resides in the Aux, with its associated Infl having trivial ID content. This auxiliary in (21) a and b is distinct in meaning as well as phonology from the one occurring in (20 a and b); we show it as $\varnothing_{to}$ below.

   The situation with the passive and present participles is more complicated. Verbal and adjectival passive phrases may look just the same; and a phrase like *falling* might be a verb, an adjective, or a nominal. We argue in detail in Cormack and Smith (1997) that - as others have argued before - there do occur passive and present participles of verbs in selected and modifying positions such as those indicated in the examples (22) to (24). The relevant complements and modifiers may either be IVPs, (i.e. {I,V} categories of type <e,t>) or APs where there is a phonologically null 'raising' A head selecting for an IVP complement.[26]   However, we may infer that the Infls associated with these participles contain the non-trivial semantic meaning directly from sentences like those in (26).

(26) a Dennis is eating fish
      b The fish was caught in the Atlantic Ocean

   Suppose we assume that 'Raising' *be*, equative *be*, and the progressive and passive *be* Aux's are semantically similar. The first two have LF content which is some variant of an identity function. Then the semantic content of the *be* Aux's will be ID. This immediately gives the required result, that is, that the Infls associated with the passive

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[26]Irrelevant instances would be APs where the A head is derived lexically directly from the verbal root, so that morphological similarity to participles is more or less accidental.

and present participles must contain the relevant semantic content.

The Infl postulated may be given as Infl[ING] and Infl[PASS]. The associated Aux, *be*, makes no substantive semantic contribution: its semantics is simply the identity operator [ID]. Since the Infl[ING] and Infl[PASS] have non-trivial content, it is to be expected that they may be utilised to express appropriate meanings in a variety of syntactic contexts: we expect, correctly, that at least some of the participial complements and modifiers exemplified in (22) to (24) will include phrases of the form $[_{\{I,V\}}$ Infl[ING] VP] (e.g. *wearing a hat*) and $[_{\{I,V\}}$ Infl[PASS] VP] (e.g. *chased by a bear*).

We suggest that the distribution of substantive and trivial content for the Infl-selecting heads is as shown in the table under (27). It is just in the cases of passive and progressive (i.e. the two Infls selected by Aux *be*) that the Infl has non-trivial semantic content (i.e. we have $[_{Infl}$ PASS] and $[_{Infl}$ PROG])): all the others have [ID] for their content. They vary, however, in their PF-content, so that there is a whole set of distinct Infl with [ID] LF-content. If the lexicon contains pairings of PF- and LF-interpretable material, such heads will be given as, for example, Infl<[-*en*], [ID]>.

features and split signs

(27)

Head	PF-Head	LF-head	PF-Infl	LF-Infl	quasi-serial?
Aux	(*be*)	ID	-*ing*	PROG	no
Aux	(*be*)	ID	-*en*	PASS	no
Tense	∅	e.g. PAST	e.g. -*ed*	ID	yes
Aux	*have*	PERF	-*en*	ID	yes
modal Aux	e.g. *can*	e.g. ◇	-∅	ID	yes
Aux	*do*	ID[27]	-∅	ID	yes
Aux	*to*	e.g. irrealis	-∅	ID	yes
Aux	∅$_{to}$	e.g. non-past	-∅	ID	yes
Tense	∅	imperative	-∅	ID	yes

The right hand column of the main table refers to the possibility of multiple occurrences of V under this Head in a quasi-serial (data are given in examples (28) to (34)). In addition to the items in the table, the Default Infl, Infl$_{default}$<-∅, ID>, which does not generally select for V, is always permitted in quasi-serials. As can be seen, it is only those Infl with non-trivial semantic content (PASS and PROG), that DISALLOW quasi-serial structures.[28]

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[27]Auxiliary *do* appears from this table to be totally useless. In standard English, it indeed occurs only when required syntactically (see Cormack and Smith (in preparation), for further discussion within this framework). However, in some L1 and L2 child language, in earlier stages of English, and in some dialects, it occurs much more freely (see data and references in Bohnacker 1997). Where it occurs unnecessarily, it will be syntactically and semantically interpretable, but redundant. We expect then that its omission or occurrence in these positions would be guided by rhetorical considerations or perhaps simplicity of production. An occurrence which appears to be syntactically unnecessary can be seen in: *Yes, he does SEEM to be trying*.

[28]Note the contrast between (29) and (31), where the [*run and bought*] phrase is passive versus perfective respectively. The differential behaviour casts doubt on the prospect of unification of the two, despite the uniform phonological identity of passive and perfective participles.

(28)   * John **is** running and buying a newspaper[29]

(29)   * The newspaper has just **be**en run and bought

(30)   John ran and bought a newspaper

(31)   John **has** just run and bought a newspaper

(32)   John **can**/**did**/wants **to**/   run and buy a newspaper

(33)   John saw Alex $\varnothing_{to}$ run and buy a paper

(34)   Run and buy a newspaper!

3.3 An alternative to multiple *vs*. unary checking

In the account given in Cormack and Smith (1996), sketched above, we proposed that Tense could multiply check for its associated morphophonological content [tense], to account for the acceptability of (30). Now we are postulating an intervening Infl, so that if multiple checking is to be used to account for serials, that multiple checking might in principle take place in one of two places: between *have* and its Infl, or between the Infl and its morphophonological realisation.

Checking as we conceive it is not intrinsically a one to one relation.[30] Rather it is a configurational relation, which holds between a pair of elements $<\alpha,\beta>$, (where α has scope over β). If it is stipulated that α must be in a checking relation with β, then nothing prevents there being more than one instance of β with which α is in a checking relation.

Consider first the checking between the LF-part and the PF-part of an item. If this can be other than one to one, as in our earlier proposals, then the two parts must be entered

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[29]David Adger observes that (28) is not as bad as (29). We propose that this is because an alternative, albeit strongly unpreferred, parse exists, with [*running and buying a newspaper*] as an AP instead of a VP (see footnote 35).

[30]Nor is selection: in the structure Aux Infl V[lex], both the Aux and the Infl will select for V, so that the relation may be many to one.

separately in the lexicon. If we revert to a more conventional view of the lexicon, they should be entered together, but we must then permit the parts to be Separated during a derivation. Given the desirable axiom that the generative device is compositional in its workings, and that Separation is a possible operation, this possibility is to be expected: that is, any constituent which has been formed may be subject to Separation into a PF and an LF part. We adopt this second view, which entails that the relation of the PF-part to the LF-part of a head or other constituent is always one to one. In implementing this, we suggest that a lexical entry of category X, entered into the numeration with index n as say $X_n[\text{LF-}X_n, \text{PF-}X_n]$, may be split into $X_n[\text{LF-}X_n]$ and $X_n[\text{PF-}X_n]$.[31]

The relation between a head and an associated Infl will be looser, however. If these are related simply by checking (which we discuss in more detail below), the relation will not necessarily be one to one.

Why should there be a checking relation between a head and an Infl? Informally, the reason seems to be this. It is always the case that one of the two has trivial semantic content, and is present in the structure as a kind of rescue device. This is because English verbs may bear only one morphological reflex of a Tense/Aspect/Mood operator. We propose then that "trivial content" is only permitted if it is associated with substantive content, in much the same way that the PF-content of a head (without even trivial LF content) must be associated with some LF-content.[32] We also tentatively propose that selection by a head of an item with only trivial LF content is impossible, and that a checking relation is the only other available relation to form an association between a head and an Infl.

If there may be more than one Infl associated with a given head, then there are two possible LF structures in relation to a serial $P, as shown in (35) and (36). The (a) versions are putative structures for examples like (1) or (6), and the (b) version for structures like (7). (The default Infls for the adjectives have been omitted for clarity; their position is discussed in the next subsection).

(35) a Infl [$_{\$P}$ V1 [$ V2]]
      b Infl [$_{\$P}$ V [$ A]]

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[31]For our purposes, the index is simply a token identifier for the lexical item. No commitment to economy based on the numeration is implied.

[32]It follows from this description that auxiliary *do* is somewhat anomalous, as noted in footnote 28.

(36) a [$_{SP}$ [Infl V1 [$ Infl V2]]
      b [$_{SP}$ [Infl V [$ A]]

There is no LF problem with the structures in (35). However, there might be with (36). A serial structure essentially takes two lexical heads - two verbs, or a verb and an adjective - and contrives from them a complex verb describing a single activity. Semantic input arising from heads other than the lexical heads is not possible unless they are within a complement.[33] For example, adverbs or infinitival *to* internal to the $P are not allowed. In (37) a and b, the serial reading is missing (coordination is still possible), but there is a serial reading for (37c), where the adverb can be construed as outside the $P. Similarly, there is no serial reading for (38).

(37) a #   Freda ran slowly and bought a paper
      b #   Freda ran and hastily bought a paper
      c   Freda hastily ran and bought a paper

(38)   #   Rosa wants to run and to buy a paper

We suppose then that in (36), if the content of the Infls is simply the identity operator ID, the LF is acceptable. If however the content is non-trivial, i.e. is PROG or PASS, then (36) will not be accepted as a serial structure at LF, leaving only (35) as a possible structure for these Infl values (as in (39)).

(39) a   Infl[PROG] [$_{SP}$ V [$ V/A]]
      b   *[$_{SP}$ [Infl[PROG] V1 [$ Infl V/A]]

Now consider the PF situation. The PFs of the heads will not appear on the tree exactly as in (35) and (36), but we can determine the possible availability of a morpho-phonological operator for each lexical head independently of the structure. An adjective A may be drawn from the lexicon with the default Infl, which is freely available, so there will be no problem relating to this, in the (b) examples. The PF of every verb must have an associated morphophonological operator applying to it, which is itself the PF part of

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[33]Thus *What did John run to the shop and buy?* is acceptable on a $P reading. It is necessary that the conjunction is a conjunction of transitive projections, however, so that any internal complement must be lower than the object.

some Infl. If the distribution of heads is as in (35), then only a single verb can be PF-licensed, because there is only one V-selecting Infl. If there are two Infl, as in (36a), then two verbs may be licensed.

Taking the LF and PF situations together, we see that if Infls LF content is ID, (36) is available, and two verbs in the $P can be licensed. If the LF-content of the Infls is PROG or PASS, then only (35) is available, and only one verb can be licensed. Thus we correctly exclude any serial V-V structure with PROG or PASS, while permitting any V-A serial, and a V-V serial with the ID content Infls.[34]

Under this explanation for the data, no micro-parameter has to be associated with the heads. The work is done by general principles relating to serials, together with normal lexical information relating to Infl heads - that is, their semantics. This is just as well, since the data required for differentiating directly the ungrammatical (29) from the grammatical (30) is hardly salient enough to provide input to the setting of any micro-parameters.

3.4 Middles

Middles, as exemplified in (40) and (41) appear to be problematic for the above analysis.[35]

(40)   a   These jeans don't wash clean easily
         b   Walnuts crack open easily

(41)   a *   Trout cooks and eats easily
         b *   Walnuts crack and open easily

The problem is that the verbs here have the morphological marking of tense, and tense

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[34]An account of the unexpected grammaticality of examples like *the* [*man* [*running and buying a newspaper*]], (due to Peter Sells) is given in detail in Cormack and Smith (1997). We argue that the modifier consists of a $-conjunction of two complex A projections, where the A is a null Raising A having a {I,V} verb phrase complement. Since each Infl[PROG] is in the complement of an A, rather than adjoined to it, it does not block the serial reading.

[35]David Adger brought the problem to our attention.

normally allows V-V $P, as well as V-A $P, as we have seen above. Middle formation itself adds no inflection to the verb. If English middle formation were lexical, as claimed by Fagan (1992), the contrast between (40) and (41) would be inexplicable.

Let us suppose that middle formation is due to a syntactic operation Mid<∅, MID>, where, following Fagan, the semantics, MID, converts a transitive of type <e,<e,t>>, into an intransitive (unergative) of type <e,t>. This operator is 'lexical' in the sense that its input must have category V, and not {I,V}.[36]

Consider the selection requirements of the various heads needed in (40) and (41), which determine their LF orderings. Mid must be higher than $, since it does not take A as input. Because serial $P requires object-sharing,[37] Mid must be higher than $ in the case of the V-V $P as well. Given that Mid cannot operate on a category {I,V}, Infl must be higher than Mid, so that the structure can only be as in (42). (The PF categories of the split Infls signs have been omitted for clarity; the category given as {I, Mid, $, V} is an abbreviation for {I,{Mid,{$,V}}}, and so on).

(42) $[_{\{I,Mid,\$,V\}}$ $[_{Infl<\underline{-s}, ID>}$ID] $[_{\{Mid,\$,V\}}$ $[Mid_{<∅,MID>}]$ $[_{\{\$,V\}}$ V[$\underline{-s}$] $[_{\$'}$ $ $[V[$\underline{-s}$]/A[-∅]]]]]]]]

The question now is whether a second instance of $[_{Infl<\underline{-s}, ID>}$ID] could be inserted anywhere, to license the inflection on the second V. Could such an Infl be adjoined to the lower V in the $P? The answer must be negative, in order to exclude (41 a and b). This entails that $ can have two operands of category V, or two of category {I,V} (as needed for ordinary tensed $P, as in the grammatical (36a) above), but not a mixture.[38] We take this to be true, and assume that $ having as operands one V, and one {I,A}, is likewise barred, thus excluding the lower position for a second Infl entirely. Suppose alternatively that a second $[_{Infl<\underline{-s}, ID>}$ID] is adjoined along with the first, outside MidP. Both these Infls would be required to be in a checking relation with their PF parts $[_{Infl<\underline{-s}, ID>}$-$\underline{s}$]; but Minimality would prevent the outer one from being in a checking relation with

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[36]As usual, the operand V will be drawn from the lexicon complete with a morphophonological operator (corresponding in the cases above to the PF part of present tense Infl). However, as has been implicit in earlier sections, this addition to V is not visible for selection, which is concerned with LF parts.

[37]Baker (1989).

[38]It seems likely that some binding is involved when I takes a [lex] projection as its operand, so that a mixed pair of operands would have distinct types, but that is outside the scope of this paper.

its PF part. Hence only one instance of $[_{Infl<\underline{-s},\ ID>}\underline{-s}]$ can be checked, and V-V $P is excluded. A Minimality violation can be avoided only if the second Infl is not of the same category as the first. We propose that Infl$_{default}$ is not of the same category as the V-related Infls, perhaps because its PF part selects for lexical categories other than V. Then Infl$_{default}$[ID] can check for its PF part Infl$_{default}$[$-\oslash$] on the A, in (42). Thus for middles, V-A $P is viable, but V-V $P is not, successfully accounting for the contrast between (40) and (41).

4 Checking

4.0 We turn next to a discussion of the nature of the checking between the relevant heads and their Infls, to show that it is actually licensed in the configurations needed.

4.1 Checking: split signs

We consider first a V-A $P such as *ironed dry* under a head *have*, as required for (43). The LF parts of the $P and its necessary Infls are assembled according to the pattern of either (44a) or (44b). Infl$_{default}$ is subject to the process of Separation, with its PF part appearing on A. Both the Infl selecting for V and the Verb are also subject to Separation, and the PF parts of each split sign are withheld (for merging later).

(43)   John has ironed his shirt dry

(44)   a Infl[/V] Infl$_{default}$ [$_{\$P}$ V [$ A]]
         b [$_{\$P}$ [Infl[/V] V] [$ [Infl$_{default}$ A]]]
         c [$_{V<iron,\ IRON>}$ *iron*][$_{Infl<\underline{-ed},\ ID>}$*$\underline{-en}$*][$_X$ $-\oslash$]
         d X[V$_{<iron,\ IRON>}$][Infl $_{<\underline{-ed},\ ID>}$] [*iron*][$\underline{-ed}$][$-\oslash$],

The withheld PF-parts are assembled into a head which is merged into the tree at the higher pre-object position X shown explicitly in (12) to (14). This gives for the PF content of X the complex in (44c). Since X selects for a complement containing all the material in (44) a or b, the contents of X consisting of the PF parts of V $_{<iron,\ IRON>}$ and Infl $_{<\underline{-ed},\ ID>}$ will be in a proper checking relation with their respective LF congeners, the LF-parts of V$_{<iron,\ IRON>}$ and Infl $_{<\underline{-ed},\ ID>}$. Separating out the categories from the

phonological representations gives us something like what is shown in (44d) (LF content for X is ignored).[39]

Consider next a V-V serial with Aux *have*, where the whole of the PF of the $P is merged at X higher than the object, immediately below the Aux, as in (45).

(45)   John has $[_{XP} [_X [_{PF-\$P[3]}$ *run and bought*$]]$ $[_{VP}$ the paper $[_{LF-\$P[3]}$ RUN AND BOUGHT$]]]$

It is not hard to see that the checking of the LF and PF parts of various heads cannot be done from the positions that they occupy in (45). In particular, PF-*bought* does not c-command or have in its scope LF-BOUGHT, so there can be no checking relation between the two. We conclude that the $P is assembled, and licensed, as an independent unit. It may then undergo Separation, which as we noted above may apply to any constituent in a derivation, giving PF and LF parts ready for assembly into a larger structure, as in (45).[40] It is the relation between the complete PF- and LF-parts of the $P that is subject to checking in (45). The matching parts are identified by their category plus the common numeration index of the outermost head in the category.
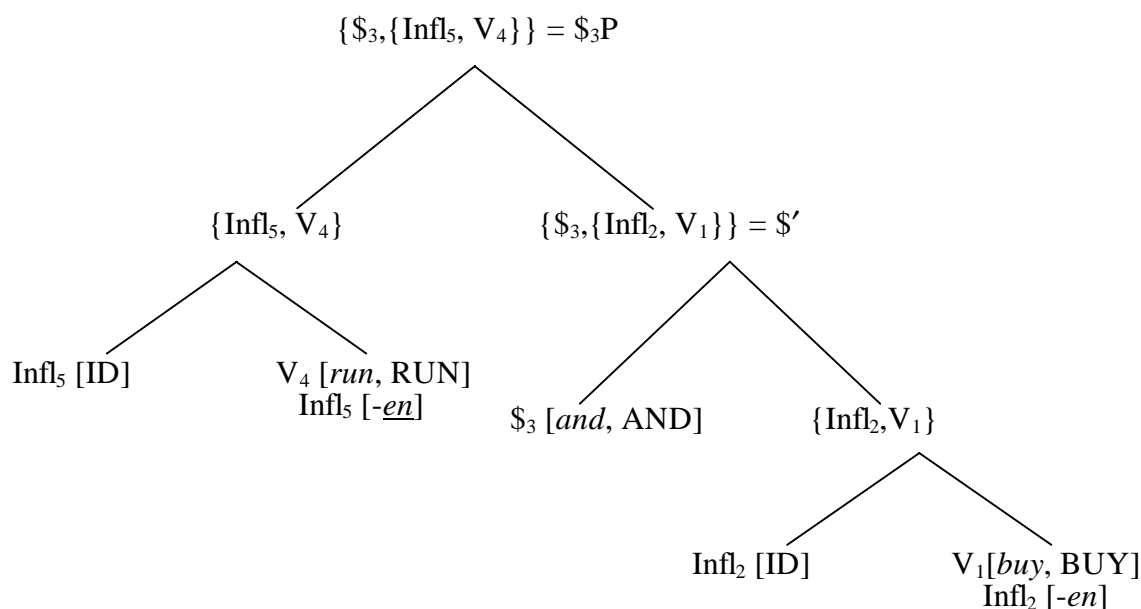
The structure for the initial $P will be as in (46).

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[39]Note that the mother category above X will necessarily have the form $\{X, \{...\{Infl...\{V..\}\}\}\}$. We might surmise that the nesting must be matched at X, so that if the morphophonological operators correspond to adding suffixes, the Mirror Principle (Baker 1985) will be observed.

[40]Separation as understood here is like a more restricted version of Copy-Move (Chomsky 1993). It is more restricted in that under Copy-Move, there must be some device which deletes unwanted portions of the repeated PF- and LF-parts.

(46)

$$\{\$_3,\{Infl_5, V_4\}\} = \$_3P$$

$$\{Infl_5, V_4\} \qquad \{\$_3,\{Infl_2, V_1\}\} = \$'$$

Infl$_5$ [ID]   V$_4$ [*run*, RUN]
Infl$_5$ [-*en*] $\$_3$ [*and*, AND] $\{Infl_2, V_1\}$

Infl$_2$ [ID]   V$_1$[*buy*, BUY]
Infl$_2$ [-*en*]

The Infl elements here are split signs. The requirement on the parts of split signs is that they should be in a checking relation with each other. In each {Infl, V} subtree, a checking relation between the LF-and PF-parts of the Infl will hold, since the Infl selects for and has scope over its sister V. No untoward checking relations are available. For the unsplit signs, we must allow the checking relation to hold trivially. The elements in the $P in (46) are all properly checked, and the $P may serve as required in (45).
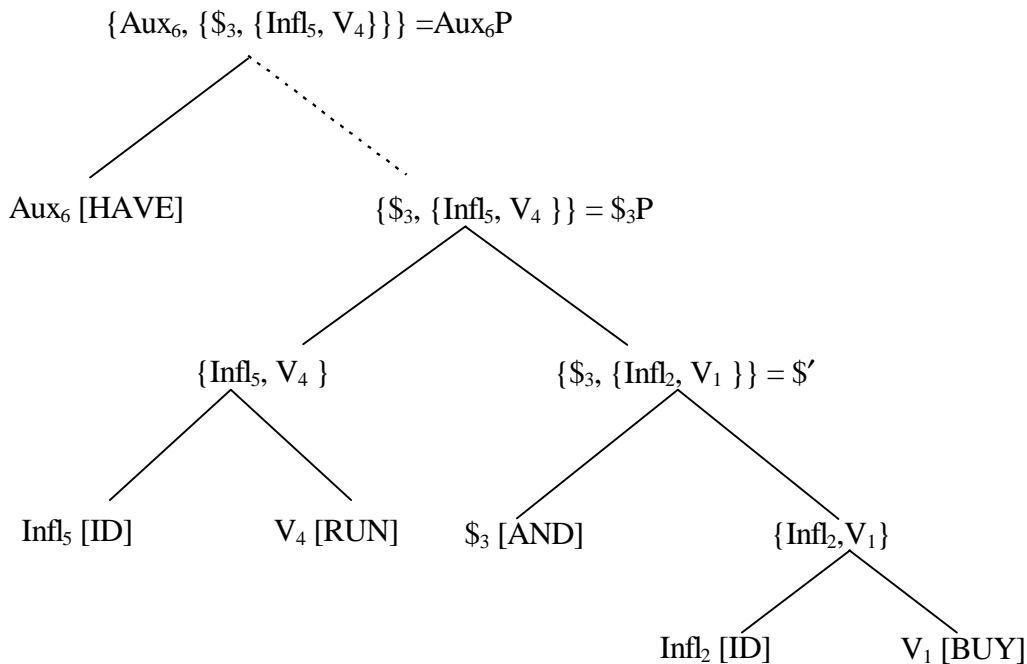
In the more general case, the same relation will suffice. If the PF part is lower than the LF part of the head, as in the example just discussed, then the appropriate relation is, as usual, scope constrained by Minimality. If the PF is higher than the LF, as in our original example (5), it corresponds to the relation of possible movement or possible chain-link in a movement theory: again, scope constrained by Minimality. The requirement for split signs is that the UNORDERED pair $\{PF\text{-}X_n, LF\text{-}X_n\}$ should be in a checking relation - this allows either to have scope over the other, giving, as required, both 'raising' and 'lowering' effects.

4.2 Checking: Infl

We next show how the Infls inside the $P are related to the superordinate Aux. Aux *have* has so far been assigned two relevant properties: it selects for a category with the feature V, and it has to be in a checking relation with Infl<-*en*, ID>. Given that a head may occur in a derivation as a split sign, the question arises as to what selecting a head, or checking a head, means. We take it that the answer is uniform. For selection, the requirement of the compositional interpretation of LF structures determines that selection must refer to the LF position of the head. Hence in the checking case too, checking 'of a head' refers to the LF position of that head. In (45), repeated below as (47) it is the relation between Aux and the lower $P that is relevant. This relationship is shown schematically in (48). Note that it is not the LF content of Infl[j] (or Infl[i]) that is at issue, but the fact that this LF content is indeed the content of Infl<-*en*, ID> (and not, for instance of Infl<-*∅*, ID>).

(47)   John has [$_{XP}$ [$_X$ [$_{PF-\$P[k]}$ *run and bought*]] [$_{VP}$ the paper [$_{LF-\$P[k]}$ RUN AND BOUGHT]]]

(48)

{Aux$_6$, {\$$_3$, {Infl$_5$, V$_4$}}} =Aux$_6$P

Aux$_6$ [HAVE]   {\$$_3$, {Infl$_5$, V$_4$ }} = \$$_3$P

{Infl$_5$, V$_4$ }   {\$$_3$, {Infl$_2$, V$_1$ }} = \$′

Infl$_5$ [ID]   V$_4$ [RUN]   \$$_3$ [AND]   {Infl$_2$,V$_1$}

Infl$_2$ [ID]   V$_1$ [BUY]

The well-formedness conditions in a structure like that in (48) are as follows. Aux *have* selects a projection with a feature [V]. This is satisfied by the sister projection: it is V *run* which is the lexical head selected. In addition, Aux<*have*, HAVE] is to be in a checking relation with Infl<-*en*, ID>. This is satisfied by the checking relation between Aux$_6$[HAVE] (the LF-part of Aux$_6$<*have*, HAVE>) and Infl$_5$[ID] (the LF-part of Infl$_5$<-*en*, ID>, an Infl<-*en*, ID>, as required). However, this is not strong enough: we need to ensure that apart from Infl$_{default}$, ONLY Infl <-*en*, ID> is in the checking domain of Aux *have*.[41] In particular, we need to exclude for instance Infl<-*ing*, ING>. This cannot be excluded by requiring that Infl<-*ing*, ING> check for [$_{Aux}$ *be*], because it may occur without an Aux.

We have just considered how the checking works for a grammatical V-V \$P under the head *have*. The situation for a V-A \$P such as *ironed dry* is somewhat simpler. The relevant LF parts will be as in either (49a) or (49b).[42]

(49)   a Aux Infl[/V] Infl$_{default}$ [$_{\$P}$ V [\$ A]]
       b Aux   [$_{\$P}$ [Infl[/V] V] [\$ [Infl$_{default}$ A]]]

As before, if Infl has non-trivial content, the pattern of (49b) will be ungrammatical. The higher head Aux[HAVE] will have in its checking domain the LF parts of both the Infls. The Infl selecting for V is the obligatory one, and must be the LF part of Infl<-*en*, ID>; the LF part of Infl$_{default}$ must be permitted, but cannot be required.

In the general case, the head (tense, aspect etc.) MUST be in a checking relation with Infl $_\alpha$, MAY be in a checking relation with Infl$_\beta$, and MAY NOT be in a checking relation with any other Infl.[43] In the case of Aux *have*, Infl $_\alpha$ = Infl <-*en*, ID>, and Infl$_\beta$ ∈ {Infl <-*en*, ID>, Infl$_{default}$}. By hypothesis, Infl$_{default}$ is universally a possible value for Infl$_\beta$. Just the two Infls in diagram (48) are in the checking domain of Aux (based on scope restricted by Minimality), and both these are of the correct kind. If one of them

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[41]By 'checking domain', we mean, that domain within which a feature might be checked.

[42]Where 'X[/Y]' is to be interpreted as 'X PF-selects for Y'.

[43]Notice that this analysis means that there must be two instances of Auxiliary *be*: one requires to be in a checking relation with Infl <-*en*, PROG>, and the other with Infl<-*en*, PASS>. For this reason, VP deletion after [$_{Aux}$ *be*] is not recoverable, and hence is disallowed, unless there is parallelism with the antecedent VP (see footnote 4, and discussion in Lasnik (1995)).

were of the wrong kind, the structure would crash.[44]

5 Parameterisation

The Infl system comes into operation whenever a lexical head (V, A, N, P) is to be taken from the lexicon. The item may or may not have the additional feature [lex], since Auxiliaries, which have feature [V] but not [lex], need inflection. Some lexical heads (A, P and N in English) are compatible with the default Infl; others, like V in English are not.

A head which selects for a V (in English) determines an Infl for it. The Infl is related to the head in a checking relation: for each head, there must be specified (i) obligatory and (ii) permitted Infls. Other Infls occurring within the checking domain of the head will cause the derivation to crash.[45]

We noted above that if the PF and LF parts of an item are paired in the lexicon, but may be subject to Separation during a derivation, then there is necessarily a one to one correspondence between the two parts. Thus although the parts are postulated to be connected only by checking, no counting mechanism need be set up to account for the one to one correspondence. We have also eliminated any need for a 'single' versus 'multiple' checking to distinguish the behaviour of examples like our original (1a) and (1b). The idea that the grammar can count is suspect: we expect that other postulated instances can and should be eliminated.[46]

The checking and associated heads that we have postulated allow for a certain amount of variation, properly due to micro-parametrisation. We noted the consequences of categorially non-identical Infl, in section 3.1. It might also be possible for a V-selecting head such as an auxiliary to fail to require an Infl, so that the V is checked by the Infl

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[44]Recollect that despite appearances, even under the scope command relations we assume, the Infl of *run* does not have scope over the Infl of *buy*, so that it does not constitute a barrier to checking. This is because neither of two operands of a two-place operator has selection-scope over the other.

[45]The formulation we have given here does not lend itself to implementation directly in terms of traditional checking features. We consider however that although the declarative specification of the necessary relations is part of the grammar, the provision of a procedural algorithm for ascertaining in particular instances whether the specification is met, is not.

[46]Icelandic 'multiple specifiers' (Chomsky 1995) are given an alternative treatment as 'Nil-1 transitives' in Cormack (1996).

features and split signs

above the Aux. This seems to happen in some Mainland Scandinavian dialects, as exemplified in (50). These are Swedish examples from Wiklund (1996): for certain matrix V, instead of the standard infinitival complement, the lower V is marked for Tense in the same way as the upper one.

(50) a Hans prövar och läser
          Hans try-PRS and read-PRS
          'Hans tries to read'
      b Sluta och strik!
          Stop-IMP and yell-IMP
          'Stop yelling!'

Note that the word shown as *och*, which Wiklund herself analyses here as an instance of T, is homophonous with, and may in fact be, the infinitival marker *att*.

   Some serialising languages are like Nupe, exemplified in (12b), in showing no tense/aspect morphology on the second verb in serial structures. One possible account would be that in Nupe, $Infl_{default}$ has V in its domain. Others show more elaboration via additions to the list of Infls which a head may optionally have in its checking domain.

   One such language is Akan, where it is obligatory with some Tense/Aspect choices for the second verb to bear a different (simpler) inflection than the first: Byrne (1990) calls this an echo.[47] The example, taken from Campbell (1989) is in the Kwawu dialect of Akan.

(51)   Yaw re-   pú   nsúo a-   gú   fɔm   hɔ
         Yaw PROG   -spit water CONS-drip floor LOC
         'Yaw is spitting water onto the floor'

If the first verb is marked with Progressive morphology, the second verb must be marked with the morphology otherwise known as 'Consecutive' (CONS). With other Tense/Aspect choices, such as Past, Perfect or Optative, both verbs show the same morphological marking, so that CONS cannot be due to $Infl_{default}$, and in this case, the Progressive extends over the whole $P. We need a head say Prog[-∅], which MUST

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[47]The distribution of standard and echo inflection is more complicated than suggested. We leave aside here the required explanations.

check for Infl[PROG], and MAY check for Infl[CONS].[48]

The question arises of how to distinguish languages like English and Nupe from Romance languages such as Italian which seem not to have any V-V serial or quasi-serial structures.[49] The obvious answer, in the context of our arguments above, is that such languages have no Infl with trivial ID content. We leave the question open for the moment.

Our proposals for 'Checking at a Distance', which allow the equivalent of both 'raising' and 'lowering', might appear to be too unconstrained to replace movement. There are two potential problems. One is that the PF-part of a sign might wander too far from its LF-part. Our answer to this is that the fine-grained Minimality condition on checking is sufficient to prevent this. Obviously, we cannot substantiate this until more analysed cases are available: we invite counter examples. The other problem is that in some cases, where standardly a 'Strong Feature' is postulated, the PF part of some sign must end up in a fixed position. If no Minimality constraints on checking ensure this, and uninterpretable features are to be eschewed, we need some alternative.

Within the framework we are proposing, one natural parameter is a restriction on split signs. In particular, we propose that a category or a head can be assigned the feature [Unsplittable], which indicates that Separation may not apply to this node.[50] Consider 'V to C Raising' in German. Suppose we assign to the phonologically empty C an affixal $\varnothing$- PF content, where the affix selects for PF-V. Then in principle, the amalgamated PF contents of C and V could stand at LF-V, or at LF-C (or somewhere between), since both 'raising' and 'lowering' of PF-contents of signs is permitted. In order to force the PF-content to be at C, we may assign the [Unsplittable] parameter to the 'empty' C. Then the amalgamated PF content can only appear at LF-C, as required. In as much as syntactic parameter settings have functional explanations, we might see the [Unsplittable] parameter as a device for identifying the LF-position of some head.

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[48]It is also necessary to explain why the obligatory Infl is associated with the highest possible verb in the $P.

[49]Spanish seems to be like English both in having quasi-serial verbs and in the range available. (José Camacho, p.c.)

[50]This feature is interpretable compositionally, in much the same way that a selection feature is.

6 Conclusion

We conclude by reiterating our major proposals. We have argued that lexical items may consist of 'split signs', whose PF and LF components may be merged in different places in the tree.

The correct relation between the two elements of a split sign is then ensured in terms of checking 'at a distance', departing thereby from the orthodox view that checking theory is restricted to adjunct-head or spec-head configurations. The checking domain of a head is given by scope (defined in terms of selection), restricted by Minimality.

We have spelt out the implications of this proposal for a variety of 'auxiliary' structures, providing a new, and we hope explanatory, treatment for the otherwise puzzling facts in (1), and for a range of serial and quasi-serial constructions, including a variety of parametric differences between English and other languages.

Further theoretical implications of our analysis are that we have more support for the asymmetric (subordinating) conjunction $ that we proposed earlier; that we need both Aux and Infl functional heads, but that in any pairing of an Aux and an Infl, only one of them may be associated with semantic content.

Finally we think that Movement is unnecessary, and that we have provided more evidence for an austere form of Minimalism.

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