

*Negation, polarity and V positions in English**

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Abstract

The distribution with respect to negation of verbs and auxiliaries in English needs a new analysis. Using data from the behaviour of modals, we argue for three negation positions: Echoic, Polarity, and Adverbial. The main claim we make is that Polarity Negation and Echoic Negation (and their Positive counterparts) have a categorial feature [V]. This fact explains why a verb cannot, but an auxiliary may, occur higher than Pol[NEG]. Soft constraints on the distribution of the Infl with which each [V] head must be associated determine the PF positions of the inflected heads.

1 Introduction

From Pollock 1989 to Lasnik 1995 and Roberts 1998, there have been various accounts of the distribution of verb, auxiliary, modal, and negation, in English. We think that all the accounts are flawed, and we intend to offer a more satisfactory one. The initial contrasts to be accounted for are as in (1).

- (1) a John often snores
b * John not snores
c John will not snore
d * John snores not

However, the full range of data that need to be invoked is much larger, because we have to take account not only of the surface distribution but of the relative scope interpretations of negation, modals, auxiliaries, and adverbs. Consider (2) and (3), where under a DEONTIC reading, the scope of the operators is as shown. An element with higher logical scope is always to the left of the one with lower scope. The relative scope of the relevant

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elements is shown to the right of the example.

- (2) a John **may not** come home late MAY NOT NOT MAY
 b Edwin **should not** eat peanuts SHOULD NOT #NOT SHOULD¹
- (3) a **Shouldn't** you be at work? *Q SHOULD NOT Q NOT SHOULD
 b **Should** you **not** eat meat? Q SHOULD NOT Q NOT SHOULD

Why is (2a) ambiguous, when (2b) is not? Why can (3a) and (3b) have the NOT SHOULD scope order, when (2b) cannot? Why is the SHOULD NOT order of (2b) missing in (3a)?

It is sometimes suggested that the readings are due to ‘lexical preferences’, with the implication that alternatives are determined by pragmatic interpretation. However, the ‘preferences’ of modals with particular classes of interpretations are not constant across languages, or even within English, as we shall see, so this is inadequate as the only locus of explanation. Within syntax, two approaches are possible. We could postulate post-Spell-Out operations which derive the correct LF scope orders, in somewhat the manner of QR for noun phrases. Or we could assume that LF interpretation relates to the initial merge position of the head, and is unaffected by subsequent movement. We will be pursuing the second option.

This will necessitate distinguishing three negation positions: sentential or ‘Polarity’ negation (Pol[NEG]), as in (4), adverbial or constituent negation (Adv[NEG]) as in (5), and echoic negation (Echo[NEG]) as in (6).²

- (4) a Leslie did not scream C T Pol[NEG] Aux VP
 b Leslie didn't scream
- (5) The burglar might have not been in a hurry C T modal Aux Adv[NEG] VP
- (6) Shouldn't you be at work? Echo[NEG] C T modal VP

¹ This reading is in fact obtainable under a ‘denial’ interpretation, with negation under Echo: see section 10.1.

² The position of the subject has been omitted from the schemata to the right of the examples. It can be assumed that it is always immediately above T.

Similarly, we need to distinguish two modal positions, Modal₁ and Modal₂, as in (7) and (8a). The position of Modal₂ could alternatively be filled by an auxiliary, as in (8b).

- (7) Peter shouldn't laugh Scope order: C T Modal₁ Pol[NEG] VP
 (8) a Peter couldn't laugh Scope order: C T Pol[NEG] Modal₂ VP
 b Peter hasn't laughed Scope order: C T Pol[NEG] Aux VP

The LF-interpretable sequence of heads we argue for is as follows, where further Aux's and Adv's, and adverbial negation may appear before V.

- (9) Echo **C T** (Adv₁) Modal₁ **Pol** (Adv₂) Modal₂/Aux (Adv) **V**

Instead of movement, we have proposed that the LF-interpretable part and the PF-interpretable part of a sign may be merged in distinct positions (Cormack and Smith 1997). When there is no Modal₁, and Pol[NEG, *not*] is present, as in (2a) and (1c) or (4a), Modal₂, or Aux, MUST have its PF in a pre-Pol position. Alternatively, for the *-n't* versions of e.g. (4b), a suitable pre-Pol PF of a modal or Aux may be amalgamated with the PF of Pol[NEG]. Otherwise, as we will show in section 11.2, this displacement is optional.³

We need to distinguish the syntactic behaviour of Pol[NEG] from that of adverbs such as *often* (1a vs. 1b), and to explain why the PF part of Modal₂/Aux, but not V, can occur to the left of Pol (1c vs. 1d). We propose that the relevant distinction is categorial: Pol has the category V. Like any other V head, and like Aux or Modal, Pol must have an associated Infl, and can bear either [default] or [bare] inflection (both phonologically null).⁴ For (1c), T checks two Infl projections as in (10); the PF-contents of NEG and Aux 'will' are Merged in their associated Infl positions, and can be checked in relation to their respective LF positions. In (10), and below, italics mark the position of a PF-interpretable item, and capitals the position of an LF-interpretable item.

- (10) [**T**PRES [**Infl**^{Pres}*will*] [**Infl**^{default}*not*] [**Pol**[V]NEG [**Aux**WILL [**V***snore*SNORE

The account needs to be supplemented by a set of "soft" ('*ceteris paribus*')

³ We use the term 'displacement' to indicate a situation where the PF-part of a sign is not merged at the position of the LF-part.

⁴ Bare inflection is checked for example by infinitival *to* and modals. Default inflection needs no checking: it arguably appears on adjectives in resultatives (Cormack and Smith 1997).

constraints. Thus a constraint needed independently for serial verb languages, rules out the sequence $\text{Infl}^{\text{default}} \text{Infl}^{\text{Pres}}$, where both inflections are checked by T (so excluding (1b)). These assumptions account for the whole range of data.

2 Background

In the work we did on checking theory in relation to serial and quasi-serial constructions (Cormack and Smith 1966,1997), we argued for a number of proposals that will be relevant here. The various claims will be given further substantiation as we see how they contribute to the explanations we are proposing for the oddities of the behaviour of negation in English.

- (a) There is no movement. Rather, the LF-interpretable part of a head is merged where it is semantically interpreted; the PF-interpretable part of a head is merged where it is phonologically interpreted. That is, a head (or a constituent) may be merged in a tree as a ‘split sign’. 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 selectional properties of a sign, such as its affixal properties, are PF properties relating to the PF-interpretable part of a sign.⁵ The correct relation between the LF-interpretable and PF-interpretable parts of a sign is ensured by checking.
- (b) Verbal inflection relating to Tense, Aspect, Mood etc. (TAM heads) is mediated by Infl heads. For example, perfective *have* must be associated with an Infl whose PF-interpretable part is the *-en* inflection on a verb or auxiliary. We envisage that the lexicon makes available, either by listing or by rule, a PF-interpretable item say *eaten*, which is associated simultaneously with two LF-interpretable parts, V[EAT] and $\text{Infl}^{\text{Perf}}$.
- (c) The proper relation between a head and its associated Infl is determined not by selection, but by checking. This allows for a head to check more than one Infl, as is required in serial and quasi-serial structures. It further allows a certain amount of

⁵ These proposals are close in effect to those of Beard 1995 (see p 368). But Beard argues that the rules governing where the PF-part of a head will turn up are part of morphology; for us, at least the checking constraints are part of syntax. However, the permitted combinations of a PF-interpretable form and its associated LF-interpretable heads is reasonably viewed as part of morphology.

flexibility in the position at which LF-Infl is merged. The heads checking Infl in English include T, as well as modals, auxiliaries, and lexical heads selecting non-finite clausal complements.

- (d) The standard Minimalist assumption is that the checking configuration is necessarily Head-Head under adjunction, or Spec-Head. We argued instead for ‘checking at a distance’, under an appropriate configuration with Minimality restrictions.⁶ We suggest below that the local mechanism is percolation and selection.
- (e) We eschew specifiers (Cormack forthcoming), so that explanations depending on placing a negative element in a Spec position are not permitted. In addition, we assume that adjunction is a form of Merge permitted only under selection (by the head of the adjunct), so that adjunction structures cannot be formed by movement.

Since we treat ‘movement’ as the Merging of PF-forms at positions distinct from that of their LF counterparts, the syntactic structure stripped of PF interpretable forms should give the LF directly. We will not have anything to say about the scope interpretations of quantified noun phrases in this paper, but will confine our attention to ‘head movement’ structures. We claim that the relative LF positions of modals, temporal operators, and negation gives the scope order of these elements. If the PF order is different, it is because the PF-interpretable part of some item has been merged in a position away from its matching LF-interpretable part.

With this in mind, we will offer an explanation of the problems associated with such data as that in (1), elaborated here as (11).

- (11) a John often snores
b * John not snores
c John did/will/must not snore
d * John snores not

This array of data gives rise to the following questions:

Q1: Why is (11b) ungrammatical? In particular,

⁶ For independent arguments that ‘checking at a distance’ is needed, see Simpson (forthcoming).

Q2: What accounts for the difference between *often* and *not* in (11a) vs. (11b)?

Q3: Why can an Aux or modal precede *not*, while a V cannot ((11c) vs. (11d))?

We investigate these problems for several reasons. First, there are long-standing problems associated with the distribution of data, as discussed by Lasnik (1995). Second, Lasnik's own solution has a serious defect, and is incompatible with our checking theory for English quasi-serial structures. Third, not all the relevant data has been accounted for. It will turn out that the data and our assumptions force some surprising conclusions.

Lasnik postulates that T can be freely an affix or a set of abstract features.⁷ Verbs other than *be* and *have* are bare in the lexicon, and need to acquire affixes under PF-adjacency with T, while auxiliaries come complete with affixes, but need to check features of T. He has no real explanation why auxiliaries can raise to (strong) T across *not*, as in (12):

(12) John can not leave early

A more serious problem with Lasnik's solution (one he himself acknowledges) is that in accounting for the ungrammaticality of (13a) by invoking the necessity for T and *can* to be PF-adjacent, he is obliged to claim that T and the auxiliary count as PF-adjacent in examples like (13b), despite the intervention of *often* (Lasnik 1995, 261 and fn. 11).

(13) a John not leaves early
b John often leaves early

This is implausible: PF-adjacency should not be insensitive to phonological material. In fact, we take (13) to show that whatever is to account for the position of an auxiliary with respect to adverbs or negation, it cannot be the attraction of Aux to T. We offer an alternative account, based on checking and on the properties of a Polarity head Pol. However, we first need to motivate some of our assumptions, and explore some further data. The arguments we put forward have implications for pragmatics, feature theory, and the form of constraints in a grammar, as well as for the problem we

⁷ Lasnik refers to Infl, but as he says in the Appendix, this Infl involves Tense, and possibly AgrS; for consistency with our later discussion, we use T here.

have posed.

3 Infl

For a clause with several inflected heads, we utilise Infl projections as shown informally in (14).

- (14) Rosa *might have been given* an armadillo.
 T[PAST] Infl^{past} Aux[MAY] Infl^{bare} Aux[HAVE] Infl^{perf} Aux[BE] Infl^{pass} V[GIVE]

Apart from the introduction of the Infl^{past}, this is an updated version of the proposals of Chomsky 1957. The lexicon supplies a PF-interpretable item *might* associated with the pair consisting of the LF-interpretable Aux[MAY] and the LF-interpretable Infl^{past}. We will argue that the PF is inserted at the Infl^{past} position. Aux[MAY/*may*] is split, and the two parts must be in a proper checking relation.

T-related Infl positions are crucial for our explanation of the negation facts. We argued in Cormack and Smith 1997 for a dual ‘T plus Infl’ structure in accounting for quasi-serials such as that in (15), with the T and Infl heads as in (16):

- (15) John ran and bought a newspaper

- (16) John T[PAST] [**Infl^{past} ran** [and **Infl^{past} bought**]] a newspaper

In Cormack and Smith 1994 and 1996, we argued that serial and quasi-serial structures essentially consist of an asymmetric conjunction of two X⁰ verb-projections, where both verbs are within the scope of a single instance of T (as is standardly argued for serial structures). Asymmetric conjunction is closer to adjunction than to coordination. It is clear here that T and its associated inflections are not in one-one correspondence, so that separate functional heads need to be invoked. Intuitively Infl here is rather like agreement: it gives possibly redundant information, which may be distributed over several items.

The relation between the T content and the Infl content is ensured by checking. We envisage that this checking is accomplished via feature-percolation and constraints on

selection, rather than by feature movement.⁸ A checking-feature may percolate from daughter to mother until it is a feature on a sister (complement) to some head which could in principle check it: at this point, checking either succeeds or fails.⁹ Thus a kind of relativised minimality is imposed on checking. Checking features relevant to this paper emanate from Infl (to be checked by a TAM head), and from the LF-part of a head (to be checked by its PF-part) or vice-versa. The conditions on checkability are then effectively c-command and minimality.

Hence, in (17), equivalently (13b) which was problematic for Lasnik, we would not expect the presence of the adverb *often* to interfere with the proper relation between the V and its Infl, or to block the checking of the Infl by T.

(17) John T[PRES] often Infl^{pres} snores

What now needs explaining is why *not* in the same position as *often*, as in (1b), DOES cause checking to fail. Our solution trades on the postulated categorial difference between *not* (with a categorial V-feature), and *often* (an Adv).

4 Clausal structure

4.1 Functional heads below C

We cannot deal with the behaviour of modals, auxiliaries, and negation, without demonstrating the LF ordering of the various elements. We claim that the order of selection of successive obligatory heads, starting from C, is given by UG and must be as shown in (18):

(18) C T Pol V

Whereas the order of these elements is fixed, each may be subject to language-specific variation: in English, for instance, Pol has a V-feature. By implication, any other

⁸ For the purposes of this paper, movement of FF would probably give identical results. However, features can percolate out of adjunction structures, where movement would normally be impossible, and this is required in our analysis of serial and related structures such as (16) (Cormack and Smith 1997).

⁹ A restriction to heads which could potentially check is also postulated by Ferguson and Groat 1994.

projections such as those headed by Adverb, Modal or Auxiliary, are optional. C, T and Pol are functional heads. All the heads except V are operators, and set up ‘adjunct’ projections.¹⁰

Selection is sensitive to the functional status of the heads. If a head selects for say Pol, then it will be satisfied by a Pol projection including additional optional adjuncts, but it cannot be satisfied by a Pol projection with an adjoined functional T. Thus selection for Pol entails occupying a position below T, but perhaps above an adverb.

We will first argue for Pol (Polarity), and its positioning.

4.2 Polarity head (Pol), and its position

We begin by arguing for Pol[NEG], and Adv[NEG]. We defer discussion of Echo[NEG] and interpretive use until section 10.

The usual head postulated in the position Pol in (18) above is Neg. However, there have been sporadic arguments (Chomsky 1955/75: 448 and 1957: 65, Laka 1994, and others) that there should be a single head which may be realised either as Neg or as Aff (the ‘affirmative’ of Chomsky 1957). Consider (19):

- (19) a The cat DOES enjoy warm weather.
 b I told you that Mary DIDN’T like broccoli

It is intuitively clear that the stress in (19a) is to be interpreted as focusing on positive polarity. There could be no reason for assigning focal stress to *do* itself, because *do* is semantically trivial. The focus then must be assigned to some head whose PF-part is incorporated in *does*. The contrast may be with Tense, or Polarity, according to context and interpretation.¹¹ Hence at least focussed positive polarity must exist; so we expect that neutral Pol[POS] exists. In section 11.2, we give distributional evidence for neutral Pol[POS]. Similarly in (19b), it is [NEG] rather than *does* which is focused. Accordingly, we take [POS] and [NEG] to be alternative semantic (i.e. LF-interpretable) heads which belong to the category Pol. In English, the PF effect

¹⁰ Following Cormack and Breheny 1994, an ‘adjunct’ projection for a one-place operator *a*, which selects for *b*, has the category {*a,b*} —that is, although it is a projection of the selecting head, it is still a projection of *b*.

¹¹ We take the examples to be viable on a non-echoic interpretation. If they are not, we rely only on the distributional data in section 11.2 for the existence of positive polarity.

associated with POS is null, and that associated with [NEG] is *not* or *-n't*. The exact status of the PF parts of these signs will be discussed further in section 11. (We differ from Chomsky 1955/75 in allowing for predicate negation, and from Chomsky (1957) and Laka (1994) in having stress as focused positive polarity, rather than as an independent content of Pol).¹²

We place Pol below T because of the distribution of temporal adverbs in relation to T and Pol. First, building on an argument from Stroik (1990), we note that temporal phrases may occur low down in the clause, where they must be within the scope of T, as in (20). Similarly, in (21), the temporal phrase must be in the scope of both the modal and Pol[NEG], and hence of T too.

(20) John gave *each* of his daughters a present [on *her* birthday]/[often]

(21) You can't [drink good claret [while your guests drink plonk]]¹³

Secondly, temporal adverbs can occur at LF higher than Pol negation. In (22), the scope order, corresponding to the LF positions of the heads, is OFTEN MUST NOT; i.e. the temporal adjunct has scope over the *-n't*, where *-n't*, as we will show in section 4.3, is associated with Pol[NEG].

(22) (Because of his hayfever,) Hamish *often mustn't* play in the field

We would expect the temporal phrases to be consistently placed with respect to T, and indeed, always to be within the scope of T.¹⁴ Then in (22), Pol[NEG] is in the scope of *often*, which is itself in the scope of T. Then Pol[NEG] must be within the scope of T, so that the ordering given in (18), [C [T [Pol [V]]]], is the one required.

¹² In addition, we assume that the PF-part of Pol[POS] is always null (apart from focal stress): unlike Laka (1994), we do not allow for the American English *so* under this head.

¹³ This is based on an example from Siegel 1984, where an 'operator raising' process is proposed to account for the scope.

¹⁴ Topicalised temporal phrases then must be 'reconstructed', or must be the PF-part of a split sign, where the LF-part is within the scope of T. That this is possible is clear with for instance *On Friday, we went/will go to Brighton*.

Note also that for (22) we must now have the ordering shown in (23):

(23) C T *often must* Pol V

That is, the PF position of the modal *must* in (22) cannot be T; we will be arguing below that it is an Infl position.

In order to show that *-n't* may be associated with Pol[NEG], but never with Adv[NEG], we need to establish some facts about the scope of modals.

4.3 LF positions of optional heads

It has been noted in the literature that with a very small number of exceptions, the scope positions of heads such as modals, adverbs and negation appearing before the main verb correspond exactly to their surface positions (Baker 1991, Ernst 1992, McCloskey 1997). The best known exceptions correspond to movement of a modal or auxiliary across negation or an adverb or both, as in (24).

(24) a	John can not come home late	NEG CAN
b	Sylvia can never climb that tree	NEVER CAN
c	You can't often bribe officials in England	NOT OFTEN CAN

The obvious interpretation of such data is the standard one, that it is the modal which is PF-displaced. There seems to be no reason to complicate the explanation by assuming that the LF-interpretable part of any head is merged in a position other than its scope position. We take this as axiomatic – but note that quantifier scope can be explained in a variety of ways, some of which allow *in situ* interpretation.¹⁵ It follows that we are postulating at least two possible adverb positions: one above Modal₁, which was needed for (23), and the one for (24c), below Pol. We differ here from Cinque 1997, who argues on the basis of the distribution of various adverb classes in Italian, and on the basis of UG orderings, that adverbial heads, and epistemic vs. root

¹⁵ The question of the scope of the subject with respect to the various negations needs further investigation, considering in particular NPIs in subject position (Laka (1994:28,29), Williams (1994a:190-191), McCloskey (1997:207), raise relevant questions).

between necessity and possibility, where obligation patterns with the former, and permission with the latter. Consider the English modals in (28) and (29), under a deontic reading.

- | | | |
|--------|---|---------------------|
| (28) | Edwin should not / shouldn't eat peanuts | (deontic) |
| | ≠ 'It is not the case that Edwin should eat peanuts' | * <i>NOT SHOULD</i> |
| | 'It is obligatory that Edwin not eat peanuts | <i>SHOULD NOT</i> |
| | | |
| (29) a | John can not eat vegetables | (deontic) |
| | 'It is not the case that John is permitted to eat vegetables' | <i>NOT CAN</i> |
| | 'It is permitted that John not eat vegetables' | <i>CAN NOT</i> |
| | | |
| b | John can't eat vegetables | (deontic) |
| | 'It is not the case that John is permitted to eat vegetables' | <i>NOT CAN</i> |
| | ≠ 'It is permitted that John not eat vegetables' | * <i>CAN NOT</i> |

(28) with *should* is unambiguous: the modal *should* has scope over negation. (29a) is ambiguous: the negation may have scope over the modal, or vice versa. (29b) is unambiguous, with negation necessarily having scope over the modal *can*. We postulate that modals fall into two classes, Modal₁ and Modal₂, and that each class is merged in a fixed position. *Should* is an example of Modal₁, and is merged higher than Pol; *can* is an example of Modal₂, and is merged lower than Pol, where Pol may be realised as *not* or as *-n't*. This accounts for the reading of (28), for (29b), and for the matching (NOT CAN) reading of (29a).

For the other (CAN NOT) reading of (29a), we assume, like Ernst (1992), Williams (1994a: 49), Zanuttini (1996), de Haan (1997), and earlier authors, that there is available a 'constituent negation' or 'adverbial negation', which may appear lower than the Modal₂ *can*. This adverbial negation can only be realised as *not*; otherwise (29b) would be ambiguous like (29a). In other words, as we claimed in the last section, *-n't* is never Adv[NEG], but may be Pol[NEG].

Suppose we investigate English in a similar fashion to Catalan, using *-n't* as a probe for POL. As in Catalan, we do find two classes of modal. We take as our exemplars of the two classes *should* and *can*, each in both deontic and epistemic uses. We have already seen their deontic uses, in (28) and (29). Epistemic uses pattern as shown in (30) and (31). The glosses are intended only to indicate the scope with respect to POL negation.

- (30) Brunhilde shouldn't be late (epistemic)
 'It is predictable that Brunhilde will not be late' SHOULD NOT
 * 'It is not predictable that Brunhilde will be late' *NOT SHOULD
- (31) Gillian can't have left (epistemic)
 * 'It is possible that Gillian has not left' *CAN NOT
 'It is not possible for Gillian to have left' NOT CAN

Both epistemic and deontic *should* are always interpreted as outside the scope of Pol and Adv negation, and both epistemic and deontic *can* are interpreted as falling inside the scope of Pol negation. The English modals which are like *should* with respect to Pol negation include almost all the 'necessity' operators: *will*,¹⁷ *would*, *shall*, *ought +to*, *is +to*, and *must*.¹⁸ The only exceptional item is *need* (without *to*), which is interpreted as inside the scope of negation.¹⁹ Of the 'possibility' operators, *could* behaves like *can*, above, in systematically being in a post-Pol position, as does modal *dare* (which has only a root meaning). For the majority of modals, the pre-Pol/post-Pol split in English appears to correspond to the 'necessity' vs. 'possibility' contrast, rather than to the epistemic vs. deontic contrast.

We have not yet mentioned *may* and *might*. Surprisingly, they behave like the Catalan modals. From (32a) and (33), we see that the interpretation for deontic *may*, is inside the scope of Pol[NEG] and outside it for epistemic *may*. For those who reject *mayn't*, and allow only *may not*, (32b) shows that in addition to the possible Adv[NEG] interpretation in (i), there is another interpretation, (ii). This is only accounted for by assuming the LF order with deontic MAY inside the scope of Pol, whereas in (33b), no such interpretation arises, allowing us to infer that epistemic MAY is necessarily pre-Pol.

- (32) a Cyril mayn't go to the party (deontic)
 ≠ 'It is permitted that Cyril not go to the party' *MAY NOT

¹⁷ Futurate *will* (and the related *would*) also fall with *should*..

¹⁸ There are restrictions on the occurrence of epistemic *must* with negation: see section 11.

¹⁹ *Need* has some NPI properties: **You need leave*; *You needn't leave*; *Need I leave?* It is not any longer licensed in all NPI contexts as for instance *anyone* is: **Everyone who I need see must come to my office*. **I will phone if I need leave late*.

- | | | |
|--------|--|----------|
| | ‘It is not the case that Cyril is permitted to go to the party’ | NOT MAY |
| b | Cyril may not go to the party (deontic) | |
| | (i) ‘It is permitted that Cyril not go to the party’ | MAY NOT |
| | (ii) ‘It is not the case that Cyril is permitted to go to the party’ | NOT MAY |
| (33) a | David mayn’t be at home (epistemic) | |
| | ‘It is possible that David is not at home’ | MAY NOT |
| | ≠ ‘It is not the case that it is possible that David is at home’ | *NOT MAY |
| b | David may not be at home (epistemic) | |
| | ‘It is possible that David is not at home’ | MAY NOT |
| | ≠ ‘It is not the case that it is possible that David is at home’ | *NOT MAY |

Might is like *may* in changing its Modal category according to its interpretation as epistemic or deontic.²⁰ There are also Raising verbs with modal interpretations, including *need+to* and *have+to*, with which we will not be concerned.

If we assume that the position of a modal with respect to Pol[NEG] is fixed by selection, then the default assumption is that what is relevant for selection is simply Pol. We have referred to pre-Pol modals as Modal₁, and to the post-Pol modals as Modal₂. As far as we have discovered, there is no difference in syntactic behaviour relating to Pol between Modal₂ and non-modal Aux, so it might be that a single category label, with distinct selection features for individual items (i.e. selecting for Pol or not), is all that is needed. We leave that open.

A summary of the LF positions for modals is given in (34). The position of the PF-part of the sign is discussed in the next section.

²⁰ The deontic possibility judgements for *could* and *might* are less certain than the others. We refer here not to the past tense forms of *can* and *may*, but to the ‘conditional’ uses. We have not in this paper considered whether there should be a Mood head accounting for the *can/could* contrast where it is not one of tense (and similarly for *should, would*).

(34)

Pre-Pol (Modal ₁)	necessity	<i>shall, should, must, will, would, ought + to, is + to,</i>
	possibility	epistemic readings only: <i>may, might</i>
Post-Pol (Modal ₂)	necessity	<i>need</i>
	possibility	<i>can, could, dare</i> deontic readings only: <i>may, might</i>

The arguments we have used above to distinguish Pol[NEG] from Adv[NEG] have depended on the relative scope of a modal and [NEG]. However, interpretive differences arise even without a scope difference.²¹ Consider (35):

(35) You should not answer

There are two readings, paraphrasable as ‘what you should not do is, answer’ and ‘what you should do is, not answer’. The associated structures will be respectively ‘C T Modal₁ Pol[NEG] [V ...]’ and ‘C T Modal₁ Pol[POS] [Adv[NEG] V ...]’, where in both the scope is SHOULD NOT. It appears that the content of the injunction lies in the (maximal) VP, which does differ in the two cases, with Pol providing the required orientation to this content.

6 Displacement of PF-Modal₂ across Pol

We showed above that for a Modal₂ like deontic *may* in (32), exemplified again in (36), the LF position of the modal must be lower than Pol. The PF position of the modal is however at or higher than Pol.

- (36) a Edwin mayn’t climb trees (deontic; Pol[NEG]) NOT MAY
 b Edwin may not climb trees (deontic; Pol[NEG]) NOT MAY

²¹ The example is based on those in Brown 1991: 87-88.

We adhere to a structure preserving principle (Emonds 1976), in the sense that the PF part of an item cannot be realised on the tree except at a position produced by the Merge of some LF-interpretable object. PF-displacement cannot generate syntactic structure. What position does the PF-Modal₂ *may* in examples like (36b) occupy? It is either at Pol itself, at T, or at some head between T and Pol. Where Pol is [*not*], the position cannot be Pol. Further, just as with Modal₁ (e.g. *must*, in (22) above), the position cannot be T, as we see from (37):

(37) Hamish usually may not play in the field in June (deontic; Pol[NEG])

If as argued earlier, temporal adverbs like *usually* are within the scope of T, then *may* is in a position X lower than T, as shown in (38):

(38) C T (Adv*usually*) X*may* Pol[NEG]*not* Modal₂MAY....V

What then is X? There are two answers compatible with our assumptions so far. PF-*may* is at the position of LF Modal₁ (cf. (9) above). This would entail that there is a Modal₁ whose LF-part is semantically trivial, and whose PF-part is phonologically empty, and affixal—inelegant at best. Or, the PF-*may* is at the LF position of the T-related Infl (which we know to have an affixal PF-part).

We can determine which option is right by considering the possibility of displacement of PF-Modal₂ or Aux when Modal₁ is present. If the “landing site” is Modal₁, this should be impossible, but in fact, there is evidence that it may occur. Consider the pair in (39):

(39) a The patient must not have eaten (deontic)
b The patient must have not eaten

In the context of some sort of medical test, there is an interpretation for each of these ‘it is necessary that it is not the case that at some time in the (relevant) past, the patient ate’. That is, both these PF-orders are compatible with the LF-order MUST NOT PERFECT. Cormack and Smith 1997 showed that the perfect content resides in the auxiliary *have*, rather than in the associated Infl *-en*. This means that PF-*have* is displaced over *not* in (39b). We can see that the interpretation requires Pol[NOT], because Adv[NEG] would give rise to the improbable interpretation ‘It is necessary that there is some time in the (relevant) past at which the patient did not eat’.

However, because of uncertainties associated with the interpretation of the perfect,

this evidence is not unequivocal. Clearer evidence can be obtained from a dialect where modals need not be tensed. Scottish English has untensed modals, and such sentences as (40a) and (40b) occur.

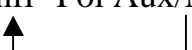
- (40) a He must no can do it
 b He must can no do it
 c MUST (epistemic) – NOT – CAN (deontic)


Brown (1991: 98) states that both these may have the interpretation ‘I conclude he is 40b) may be interpreted as having the scope order as in (40c), so that we can see that for (40b), PF-*can* is raised over Pol[NEG] to some position lower than that of Modal₁. Similarly, John Anderson (p.c.) states that (41a) can have either of the two meanings in (41b) and (41c).

- (41) a Edwin **might could not** eat peanuts
 b It's **possible** that Edwin would be unable/**not allowed** to eat peanuts
 c It's **possible** that Edwin would be able/**allowed** to **not** eat peanuts

If we continue to assume that the deontic *could* is merged below Pol[NEG] in Scottish English, then in (41b), the PF of the deontic *could* must have been displaced across Pol[NEG], even though there is an epistemic Modal₁ present.

We propose that where some PF must be displaced over Pol[NEG], for (36b) and (39b), (40b) and (41b), an Infl is merged above Pol, and this Infl hosts the PF of Aux/Modal₂, as shown in (42) (for cases without Modal₁, such as (36b)), and (43) (for cases with Modal₁, such as (39b), (40b) and (41b)).

- (42) C T (Adv) Infl^T Pol Aux/Modal₂ ... V


- (43) C T (Adv) Infl^T Modal₁ Infl^{bare} Pol Aux/Modal₂ ... V


However, it is important to note that the raising of modal₂/Aux in the presence of Modal₁ is not obligatory. This can be seen both in Standard and Scottish English, in the (a) versions of examples (39) and (40). We defer discussion to section 9, where we consider the question of what drives these choices of Infl position, and the occurrence in an Infl position of PF-Modal₂. The status and position of the *-n't* forms is discussed

in the next section.

7 Can't and won't

The crudest treatment of *-n't* postulates that it is a clitic, which attaches leftwards.²² An alternative has *-n't* as a morphophonological operator, to allow for the irregularity when it cliticises to *can* or *will*. However, a clitic should not have irregular phonological effects, so that the first suggestion is unhelpful (see Zwicky and Pullum (1983) for systematic argumentation against the clitic hypothesis). A morphophonological operator should affect only a head for which it selects, and we have argued that Modal₁ (which includes *will*) selects for Pol, rather than vice versa. In addition, we had examples like (39b), repeated here as (44a), with PF-displacement of Aux across Pol[NEG] *not*, and where there is a sharp contrast with the ungrammatical (44b).

- (44) a The patient must have not eaten
 b * The patient must haven't eaten

It appears from this that *-n't* is not willing to attach to an untensed head — or rather, given our analysis, it must attach to a PF-Aux/modal which is also attached to the PF-part of Infl^{Tense}. Given this, and the irregular forms, the appropriate and traditional move is to assume that items such as *can't* and *won't*, and indeed regular forms like *mustn't* and *hasn't*, are entered in the lexicon. We agree; but the form we postulate for the lexical entry is not the standard one. In particular, we claim that the phonological form *can't* has no meaning, in the regular sense of 'having a meaning'. To see why, consider (45a), with the scope interpretation as indicated in (45b).

- (45) a Lionel can't (often) climb that tree
 b NOT (OFTEN) CAN²³

If no adverb intervenes, we could assign a meaning to an element *can't* which could be

²² We are grateful to John Harris for discussion. He is in no way responsible for our conclusions.

²³ The impossible scope order OFTEN NOT CAN could correspond to (45a) only if InflT were inserted above *often*, to host PF-*can* and PF-*not*. But this is ruled out by the constraint in (55) of section 9.

an instance of Modal₂ (but it must not fall in the scope of Pol[NEG]). The meaning could be given as $I_p[\text{NOT}(\text{CAN } p)]$, where p is a variable over predicate meanings (compare Gazdar et al. 1982, rule 15). However, for the case where the adverb is present, even if we could have the adverb selected by the modal, the latter would have to have a meaning $IaI_p[\text{NOT}(a (\text{CAN } p))]$, where a is a variable over adverb meanings. The consequent disjunctive lexical entry is bizarre.

Our alternative proposal (see section 2, item (b)) is that a lexical item consists of an association of a PF-interpretable form with ONE OR MORE LF-interpretable forms. In particular, *can't* is a PF-interpretable item associated simultaneously with each of the LF-interpretable items CAN, Pol[NEG], and Infl^T, and as such must be in a checking relation with each of those heads. However, nothing in the lexicon dictates how those heads should be arranged in relation to each other, so the relative positions of LF-modal and LF-Pol may vary according to the class of modal.²⁴

The inclusion of a PF-Infl with the PF part of a lexical head is obligatory (see Cormack and Smith 1996 and 1997 for arguments within our framework), but the particular restriction to Infl^T is stipulated to eliminate (44b). We assume that this is a historical accident, perhaps arising from an earlier stage in which only pre-Pol heads could host *-n't*.

8 Checking and the Head Movement Constraint

We will now show how our assumptions can give a natural answer to questions Q2 and Q3 of section 2.

Suppose some inflecting head must be PF-displaced to an Infl above Pol. It seems that the HMC cannot be correct, since Pol[NEG] *not* intervenes between the LF- and PF-positions of a displaced Modal₂/Aux, and we cannot (by hypothesis) circumvent the HMC by placing *not* in a Spec position. Further, intervening adverbs do not disrupt the checking. However, we do need an explanation which can provide an alternative to the HMC to account for the impossibility of examples like (46) (some Infl information has been omitted for clarity in (46b)).

²⁴ Note also that we say nothing whatsoever about the Mirror Principle (Baker 1985). In fact, *can't* lexicalises [NOT ..[CAN ...]], while *mustn't* lexicalises [MUST.. [NOT...]], so it is not possible to retain the principle strictly.

(46) a *John been not has swimming

b [T [Infl^Tbeen [PolNEGnot [AuxHASHas [Infl^{-en} [AuxBE [Infl^{bare} [swimming

The LF-interpretable and PF-interpretable parts of ‘be’ need to be in a checking relation. We proposed (cf. section 3) that the feature, in this case LF-Aux-*be*, percolates up the tree until it is the sister of a head capable in principle of checking it under selection. For LF-Aux-*be* to check successfully, we would need this feature to raise to the node above Pol, where it will be selected by PF-Aux-*be*. However, before it percolates so far, it will be a feature on the complement of PF-Aux-*have*. A head of the same category is in principle capable of checking the LF, so that the derivation crashes when there is a mismatch of lexical item where PF-Aux-*have* has as a feature on its complement, LF-Aux-*be*. This is our minimality effect.

It is now immediately obvious why intervening Adverbs do not disrupt the checking: they do not have category Aux, and so do not interact with checking LF-Aux. This is our answer to Q2 of section 2. It follows also, of course, that Pol itself cannot have category Aux in English.

This also suggests a possible parameter setting which will account for why V in English cannot split across Pol[NEG] giving rise to such examples as (11d): we may assume that in English, Pol has the category V. This answers Q3 of section 2. We will see later that this hypothesis has further explanatory potential. What we need to consider now is the exact category matching required for the checking.

We assume as usual that a ‘category’ may consist of a bundle of categorial features. If LF-[V, Pol] is a potential checker for PF-V, as hypothesised, then a checker’s categorial features either include, or intersect with, those of the checkee. The more natural choice would seem to be inclusion, so that all the features of the checkee are taken into account. This entails that an ordinary ‘lexical’ verb cannot for instance have the categorial features [V, Lex], but an auxiliary could have the features [V, Aux].²⁵ If so, the V feature could be used to identify inflectable categories.²⁶ We will tentatively assume that these suggestions are correct.

²⁵ The notion ‘categorial feature’ is essential, since the complete set of features of a verb will not be a *have* and *be* are categorially non-distinct from auxiliaries and modals, but they are distinguished by the fact that canonic auxiliaries and modals are operators, while main verbs are not.

²⁶ We argued in Cormack and Smith 1996 that in Japanese, Verbs and a subset of Adjectives are T/A inflectable. We could postulate [V] and [V, A] for these, with [A] or [A, N] for the other adjectives.

The idea that Pol is a verb is not in itself very strange. There are for instance languages where polarity negation is only adverbial, but in others it may be an auxiliary, or a lexical verb (Payne 1985).²⁷ Here, we propose that polarity negation is instantiated as a functional V, perhaps with the features [Pol, V, [/V]], where [/V] indicates selection for a V-projection.

9 Deriving PF-displacement across Pol[NEG]: soft constraints

It is now possible to ask what drives the displacement of PF-Aux/Modal₂ across [Pol, V][NEG]. The situation is that this displacement is obligatory when Modal₁ is absent, but optional when it is present. An explanation entirely in terms of strong features is not possible. We argue in this section that the position at which elements may be merged is partially regulated by a set of constraints whose function is to eliminate optionality in syntax except in those cases where a particular language exploits apparent optionality for semantic or pragmatic purposes. We surmise that the syntactic processing device does not function effectively if faced with an arbitrary choice of options.

Under the hypotheses we have put forward, the positioning of Infl elements is free. We made use of this flexibility in our 1997 account of serial verb morphology. Similarly, the positioning of PF elements is constrained only by the minimality constraints. However, there need to be sufficient constraints on this flexibility to ensure that in a particular case, the outcome is determinate. We have already tacitly assumed that a PF element will be merged at the same position as its LF part unless some other constraint forces it to be elsewhere, i.e. the sign should not be split. There is then a (soft) constraint as in (47).²⁸

(47) Signs are unsplit

²⁷ The V instances Payne gives (section 2.1.1, p 208). are lexical main verbs subcategorising for full complement clauses.

²⁸ There are clearly both similarities and differences between our proposals here and those of Optimality Theory. For a general introduction to OT in syntax see Pesetsky 1997; for particular proposals concerning negation and inversion, see Grimshaw 1997 and Bresnan 1997.

Consider a verb and its associated Infl. Does the amalgamated PF V+Infl merge at V or at Infl? We propose that there is a constraint as in (48) which takes precedence over (47) (necessarily, since it is more specific):

(48) Infl is unsplit

Now suppose we have C^{inv} , that is a C which is the locus of inversion. This C has an affixal feature requiring its PF part to amalgamate with the PF-part of a [V] element. The inversion requirement is stipulated in (49).

(49) C^{inv} is unsplit

Since PF-C and PF-V are amalgamated, PF-Infl must be part of the same complex. There is then a conflict between (48) and (49). This will be resolved in favour of (49) by the constraint in (50).

(50) **Raise** (rather than lower)

A further constraint, (51), keeps relevant elements close to each other. (51) is ranked below (47).

(51) Checker and checkee are **adjacent**

We assume that these constraints originally had a functional motivation, but that they have been grammaticised. We also assume that since ‘the grammar can’t count’, no constraint of the form ‘checker and checkee must be as close as possible’ or ‘shortest move’ is available: we have adjacency or nothing.²⁹ Since in certain situations, either one of two constraints might reduce indeterminacy, we expect that the set of constraints is partially ordered – the processing device does not have to choose which to apply. They are all ‘ceteris paribus’ (i.e. soft) constraints, that is any one is inoperative if a more highly ordered constraint makes it impossible to fulfil the condition. We expect the ordering to have functional motivation too. It follows that the

²⁹ Chomsky (1995) eliminates the economy condition ‘shortest move’ of p 191 in favour of the MLC, an inviolable condition on movement (p 296).

constraints will be part of UG.³⁰

In addition to the five constraints in (47) to (51), we need two more. In serialising languages, as we noted in section 3, two verbs come within the scope of a single T or other TAM operator. Each verb has an associated Infl, to be checked by the TAM head. It is very frequent that serialising languages allow one of the two verbs to bear a reduced form of the inflection, usually null. It is intuitively natural that the more informative inflection is associated with the first of the two verbs, as required by (52).

(52) **Infl-Precedence**

Infl^a must precede Infl^b, where both Infl are checked by the same head, and **b** is a reduced form of **a** or is [default].

With these constraints in mind, consider first a structure with Pol[NEG] where Modal₁ is absent.

- (53) a Fido has not come with us (reading: NOT HAS)
 b *Fido not has come with us.
 c T[PRES] Pol-V[NEG] Aux[HAS] [VP come with us]

T checks for one or more Infl heads. The normal Infl head checked is Infl^{pres}, which is partly responsible for the *has*. However, we argued in Cormack and Smith 1996 that it is also possible for T[PRES] to have Infl^{default} in its checking domain, since Infl^{default} does not project any feature for checking. The phonologically null inflection on Pol[NEG] *not* in (53) must be determined either by Infl^{pres} or by Infl^{default}: we postulate that Pol-V*not* can NEVER be related to Infl^{Tense}. In this, Pol[*not*] will be the reverse of a modal, which in standard English can be related ONLY to Infl^{Tense}.³¹

The task now with respect to (53c) is to place Infl^{pres} and Infl^{default} into the tree in such a way that checking can take place, and the constraints are met as far as possible. So far as we are concerned here, the Infl-Precedence constraint MUST be met. This entails that one or other of the Infs associated with Pol and Aux cannot be adjacent; the optimal arrangement has Infl^{pres} adjacent to T, and Infl^{default} adjacent to Pol. The

³⁰ This is under the assumption that for example the fact that some language is substantially head-final cannot affect the constraints.

³¹ Unlike other heads which select for V, Pol does not itself check an Infl (e.g. as perfective *has* checks Infl^{en}).

Raise constraint of (50) ensures that $\text{Infl}^{\text{default}}$ is positioned above rather than below Pol. This leads to (54), as required for the PF order of (53a). The operation of the constraints thus provides our answer to Q1 of section 2.³²

(54) T[PRES] $\text{Infl}^{\text{pres}}$ $\text{Infl}^{\text{default}}$ Pol-V[NEG] Aux[has] [_{VP} come with us]

If there were an adverb such as *often* above Pol, where would the two Infs stand in relation to this? The decision here rests on preserving the correspondence between PF order and LF scope where possible, as encapsulated in the final constraint in (55):

(55) **Preserve-Scope:** Preserve LF-scope order in PF-order

Since *often* has scope over both Pol and Modal_1 , it should be placed above the associated Infs. The constraint in (55) is ranked lower than the Infl Precedence constraint (as witness the non-correspondence of PF order and scope for NEG and *Modalmay*), but above Adjacency, (51), since $\text{Infl}^{\text{pres}}$ will now be separated from T.

The situation when there is a Modal_1 present may be parallel, except that the two Infs involved would be $\text{Infl}^{\text{bare}}$ and $\text{Infl}^{\text{default}}$, checked by Modal_1 .

(56) T[PRES] $\text{Infl}^{\text{pres}}$ Modal_1 [MUST] $\text{Infl}^{\text{bare}}$ $\text{Infl}^{\text{default}}$ Pol-V[NEG] Aux-V[HAVE] ...

This leads to the inversion effects as in (57b); though here the uninverted form in (57a) is equally acceptable.

- (57) a The patient must not have eaten
 b The patient must have not eaten
 c MUST NOT HAVE

³² There are many languages, such as Italian, where PF-Pol[NEG] is systematically higher than a modal (see de Haan 1997 section 3.3.2, p 92). One possibility is that rather than parametrising the Infl Precedence condition, we assume that the opposite choice is made with respect to which of the two uninflected heads may be associated with $\text{Infl}^{\text{default}}$, so that Pol may be associated with Infl^{T} , while Modal may be associated with $\text{Infl}^{\text{default}}$ but not with Infl^{T} . Another possibility is that the Pol[NEG] is cliticised to PF- Infl^{T} , somewhat like *-n't* in English. Similarly, the case of head-final serialising languages which have overt inflection only on the final verb of the series might seem to cast doubt on the lack of parametrisation. However, it might be that what we have is null Infl combined with overt T or Asp heads. In this case, we predict that there can be no irregular morphology on the verbs.

If, as suggested above, PF-Pol-V may be associated with any Infl except Infl^{Tense}, this is exactly what we expect. When the numeration contains Infl^{bare} associated with Pol, no inversion is required under the Infl-Precedence constraint (52), as the Infl associated with the Aux may be merged adjacent to the Aux.³³

(58) T[PRES] Infl^{pres} Modal₁[MUST] Infl^{bare} Pol-V[NEG] Infl^{bare} Aux-V[HAVE] ...

The Scottish English data of (40) and (41) are accounted for in exactly the same way.³⁴ The constraint we have not so far used, (49) will come into play in section 11, when we consider inversion to C.

10 Another negation position

10.1 Negation in echoic use

There are some exceptions to the generalisation that Modal₁ takes negation in its scope (see Gazdar et al. 1982, fn.17, Brown 1991, Williams 1994b). Consider the following:³⁵

(59) A to B: **Shouldn't** you be at work?
 Interpretation: Is it not the case that you (B) should be at work?

(60) A: You should eat more vegetables

³³ This means that the set of constraints is strictly syntactic: it does not determine what items are selected for the numeration, although selecting Infl^{bare} for Pol rather than Infl^{default} leads to a derivation with more constraints met.

³⁴ The discussion has tacitly assumed that the placing of the Infl was a matter of semantic indifference. For the Infl concerned, Infl^T and Infl^{bare}, this is true, because as argued in Cormack and Smith 1997, these Infl have the semantically trivial identity function as their meanings. But we argued that for *be -ing* and *be -en*, the semantic content PROGRESSive or PASSive is contained in the Infl rather than in the Aux. However, since *be* is post-Pol, we cannot have Pol between *be* and the host for the Infl it checks. Thus no interesting, or untoward, cases can arise.

³⁵ We are grateful to Keith Brown for insisting on our taking these data seriously.

B: No I **shouldn't**

Interpretation: No; it is not the case that I (B) should eat more vegetables.

(61) You should eat more vegetables, **shouldn't** you?

It is clear that the natural interpretation of each of these requires the *should* to be in the scope of the negation. But there are robust data indicating that *should* is a Modal₁ head, falling always outside the scope of negation in ordinary contexts. There are two problems then: what contexts require that *should* falls inside negation, and how is this accommodated within our framework.

A first hypothesis might be to do with the surface position of the negative morpheme. However, for a negative element to have scope over *should*, it is neither necessary nor sufficient that such an element c-commands *should* at surface. In (62), a negative element c-commands *should*, but the scope order is as usual, with the only interpretation being SHOULD NEVER.³⁶

(62) Never should anyone have entered the room

In (63), there is an interpretation entirely parallel to that of (59), yet the negation is on the surface lower than *should*.

(63) Should you not be at work?

'Is it not the case that you (B) should be at work?'

Borrowing from Relevance Theory (Sperber and Wilson 1995), we characterise the contexts exhibited in (59), (60) and (61) as ECHOIC USE. The echoic nature of the reply in (60) is clear: the content 'you should eat more vegetables' is an echo of the original given by speaker A. Tags, as in (61), are always echoic. The idea with (59) is that the belief, or at least, expectation, 'B should be at work' is held by A, and the question asks whether that belief should be revised to its negation. We call the negation which is external to an echoed proposition echo-negation. By contrast, the example in (62), like those in previous sections, shows no echoic use.

There is now a syntactic question to be answered. If Merge constructs LF, and if

³⁶ The scope order 'NEVER SHOULD ..' would indicate for a deontic reading that there is never an obligation ... Such a reading is not obtainable.

should is Merged above Pol, then how is echo-negation to be accounted for? If, as we have postulated, Merge gives the scope position of a head, then there is only one possible answer: there must be a syntactic position, Echo, for echo-negation, somewhere above Modal₁. This in turn leads to questions about the *not* in (63). It could be a PF-part merged at a position lower than its matching LF-part, as is compatible with our checking theory (Section 2: (c)). Or, it could be some sort of negative agreement or concord marker, where the actual echo-negation head is phonologically empty.

First, let us consider the LF position and content of the head. For the latter, it seems likely that like Pol, the head could have either positive or negative content. At least for questions, there is a close relation between the echo-negation questions and rhetorical questions, such as those in (64), which are also echoic (see Smith and Tsimpli 1995: 64).

- (64) a Who **does** have any money?
 b Who **shouldn't** eat less junk food?
 c **Aren't** I clever!

If this is right, note that even in positive questions, there probably needs to be 'lowering' to account for the position of the stress in (64b). Tags, which are echoic, may be either positive or negative. We therefore assume possible values [POS] and [NEG] for Echo.³⁷

The position of Echo is lower than that of the *wh*-phrase, but presumably above the Case-position of the subject. The echo is normally confined to root environments, but can, as one would expect, appear embedded under heads which select for representations of thoughts or speech, such as (65).

- (65) Nora asked/wondered whether (on a weekday), Jo should not be at school
 (66) If a man owns a donkey, mustn't he feed it?

In (65), what is echoed can and must include the fronted [*on a weekday*], so it seems that the Echo may precede a Topic/Focus position. However, if topics are reconstructed, or if the topic position contains only the PF-part of the topicalised

³⁷ Echo-questions, such as 'he said he'd done *what*?' or 'He said he'd *whatted*?' presumably have Echo[POS].

phrase, as suggested in footnote 14, this tells us nothing about the LF position of Echo. The Echo is lower than the adjoined *if*-clause in (66). We stipulate that the Echo head selects for C, and hence occurs freely with respect to other optional adjuncts such as Topic. If as argued in Aoun and Li (1993:232), Cormack (forthcoming), *wh*-phrases are headed by an item of category W, where W is another functional head, then Echo will fall inside W, as required.³⁸

The arguments we have used to distinguish Echo[NEG] from Pol[NEG] have depended on the logical scope of modals and negation.³⁹ However, Cattell (1973: 616-619) arrived at much the same conclusion on the basis inter alia of the possible readings of examples like that in (67):

(67) Sally isn't pregnant, is she?

He paraphrases the readings as 'It is correct that Sally isn't pregnant, isn't it?' and 'It isn't correct, by any chance, that Sally is pregnant, is it?'. We would assign to them structures based on 'Q [C T Pol[NEG] Aux-V ...]' and 'Q Echo[NEG] [C T Pol[POS] Aux-V ...]' respectively. The NEG Aux scope order is the same in both, but it appears that the assertion on which the question is based is the content of CP, which differs in the two cases.

Carston (1994, 1998) argues that all Metalinguistic negation is implicitly echoic. She rejects any semantic ambiguity in the negation operator itself, and asks of metarepresentational use 'If it is not part of the grammar then how does it arise in interpretation?' (1994: 338). We now have a novel answer to this question: echoic use IS represented in natural language syntax.⁴⁰

10.2 Concord or lowering?

We have postulated Echo[NEG] at a higher position than the subject, but no

³⁸ Recollect that an adjunct cannot adjoin to a functional projection unless the head of the adjunct selects for the functional head (section 4.1).

³⁹ Compare this discussion with the discussion of (35) in section 5.

⁴⁰ It seems that at least Adv[NEG] can also have an echoic interpretation:

(i) The roses had been not cut, but torn, off the bush.

This should be compared with the Romance 'presuppositional' negations discussed in Zanuttini 1997.

phonological content appears there. In any language, the number of elements with null phonological content has to be limited. The majority have trivial (i.e. the identity) semantic content; but arguably, null heads with non-trivial content include subordinating conjunction, PRO, and T, in English. The last of these correlates with the generally overt PF-content of Infl; if Echo is a TAM type element, we might assign it an Infl-type correland. Otherwise, Echo[NEG] seems unsuited to being PF-null.

The idea that there is concord might appeal because of possible connections with languages that have rampant concord, and with earlier stages of English. The mechanism would require something with the properties of an Infl head: it percolates its features for checking, and produces a PF which is realised along with the PF of some designated category. Let us call the head NC, for ‘negative concord’. The hypothesis then will be that Echo[NEG] must select for a complement bearing among other things the feature [NC^{not}], which itself can only be checked by Echo. NC is such that its PF can only appear in the *-n’t* form along with a [V, Aux], or if in the *not* form, somewhere in the region of Pol, as required by examples such as those in (59), (60), and (63). The most likely position for NC would be at PF-Pol[POS]. However, no explanation as to why this should occur suggests itself.

Let us consider the alternative, lowering. Lowering in a transformational framework has generally been considered dubious, largely because of complexities arising from the (now discarded) ECP. However, McCloskey (1996) has recently argued convincingly for Irish that C has to be lowered, as has Henry (1992) for Belfast English. It should also be noted that with respect to our proposed checking mechanism, the cost of lowering is negligible or nil. For exclusively upward displacement, we would stipulate that only an unchecked feature corresponding to the LF-part of a split sign can percolate a copy up the tree for checking, whereas for upward or downward displacement, an unchecked feature corresponding to either part of a split sign can percolate a copy up the tree for checking. In the latter case, we need to appeal to the constraint (50), favouring raising.

The strongest argument in favour of lowering is that it allows a very simple explanation of the PF-placement of Echo[NEG]. We have argued that Pol has the categorial feature V. Suppose that Echo does as well, since it is so similar, having both POS and NEG values. Then there must be an Infl head associated with Echo. As with Pol, assume that this may not be Infl^T. We are concerned just with tensed clauses, so the Infl Precedence Constraint of (52), and the other constraints, will determine that the array of Infl must be as in (68a), parallel to (54), for Modal₂ without Modal₁, and as in (68b), parallel to (58), for instance for Modal₁. The first Infl^{default} is the one associated with Echo.

- (68) a [Echo, V] C T Infl^T Infl^{default} Infl^{default} [Pol, V] Modal₂ ...
 b [Echo, V] C T Infl^T Infl^{default} Modal₁ Infl^{bare} [Pol, V] ...

Given the minimality condition, PF-Infl^{default} cannot be displaced across Infl^T to reach LF-Echo, even if Infl^{default} were split. PF-Echo MUST lower to Infl^{default}. This is a welcome result, since it otherwise seems perverse for Echo not to be PF-realised in its LF position. The Concord suggestion is essentially arbitrary, and makes no such prediction.

Horn (1989: 461) expresses some surprise that if there is a wider scope negation as well as the ordinary sentential negation, the negation morpheme for the former never turns up in the expected position i.e. at the periphery of the clause (citing Dahl's sample of 240 languages). His observation leads us to infer that Pol[NEG] and Echoic[NEG] must bear inflectional features in the majority of languages — hence being forced to occur in the vicinity of some T.

He is also (op. cit. 366) surprised that if there is ambiguity, the same morpheme is used for both forms of negation. Our account for this is that the two may well be distinguished only by their selection properties. That is, the Pol and Echo distinction we have been using is to be taken as mnemonic rather than real, like Modal₁ and Modal₂, which should just be [Aux, V]. If the two negations are categorially distinguished as [Pol [/V]] and [Pol [/C]], we would expect them to have the same morphological realisation, just as we do for instance for *seems*, [V[/C]] and [V [/V]]. However, if this is correct, the selection features must themselves be selectable, so that Modal₁ may be characterisable as [V, Aux [/[Pol [/V]]]].

11 Gaps in the paradigm

11.1 The lexicon and *-n't* gaps

There appear to be both arbitrary and systematic gaps in the distribution of *-n't* forms. We compare these gaps with the availability of full *not* examples. The arbitrary gaps concern epistemic *mustn't* in British English, and first person *aren't*.⁴¹

⁴¹ There are more gaps in Scottish English.

Consider the data in (69), with epistemic *must* in each case.

- (69) a (i) *If his car isn't in the garage, John mustn't be at home.
 (ii) #John must not be at home, must he?
 b (i) Mustn't John be out, if his car isn't there?
 Must John not be out, ...
 (iii) Must not John be out?⁴²
 (iv) A: You must be joking
 B: No I mustn't.

The example in (69a ii) is unacceptable with a reversed polarity tag. This shows that the negation in [John must not be at home] can only be Adv[NEG]. The generalisation then is clear: *must* is not available with Pol[NEG]. This is specified in the lexicon by requiring that *must* select for Pol[POS]. All the examples in (69b) are echoic, as can be ascertained by considering the absence of a 'MUST NOT' scope order. These then have Echo[NEG] and Pol[POS].

About the behaviour of *aren't*, there has been considerable controversy, and no satisfactory solution (see Gazdar et al. 1982: 611, Bresnan 1997). We take it that *aren't* is historically *amn't* (cf. the pronunciation of *can* vs. *can't*).

- (70) a * I aren't cold
 b I'm not cold
- (71) a (i) Aren't I allowed to see it?
 (ii) What aren't I allowed to touch?
 (iii) Aren't I clever!⁴³
 b A: You are silly
 B: * I aren't silly!

The required lexical information about *aren't* can be stated as in (72):

- (72) There is a PF-item *aren't* associated with V[BE][1 sg], and C^{inv}

⁴² This formal style of Echo[NEG] in questions is discussed in section 11.2 below.

⁴³ Syntactically, this is a question, and interpretively, a rhetorical question.

There is no other PF-item *aren't* associated with V[BE][1 sg]⁴⁴

A comparable characterisation is impossible under a 'movement' analysis.

The systematic gaps appear in three relevant inversion environments (omitting those not allowing negation at all):

- (73) Question: a # Shouldn't Theo eat ice-cream?
 b Should Theo not have been singing?
 c # Susie should be asleep, **shouldn't** she?
 d Who shouldn't we forget to invite?
- (74) Conditional inversion: a *Weren't Harry so cross, Maria would apologise
 b Were Harry not so cross, Maria would apologise
- (75) Negative inversion: a # Seldom doesn't it rain in April
 b Seldom can it not have rained in April

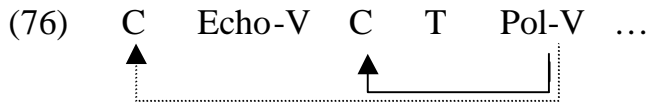
The examples marked with a hash, #, are only available with Echo negation. It appears that inversion of an *-n't* form is highly restricted. With a single exception, it cannot occur with Pol[NEG]. The exception is that of (73d), where we have not a root question but a *wh*-question.

We know of no analysis of this surprising range of data. The story we will tell is speculative, and requires independent justification for the extra postulations we make, which we cannot provide here.

Within the subtheory which we have put forward, there is one obvious form of explanation for such a distribution. If PF-Pol[NEG] cannot reach a certain position, it is because some other head with the feature [V] intervenes, and prevents checking. Echo is such a head. Suppose then that we assume some form of split C, where the higher C, selects for Echo.⁴⁵ In (76), the PF-displacement shown with a dotted line will be unavailable, so that any negation appearing above the subject must be Echo[NEG].

⁴⁴ The descriptions here are like that given for *aren't* in Gazdar et al (1982: 610) in including a feature for inversion. Some dialects are more restricted.

⁴⁵ For split C see Rizzi 1997 and various CP recursion theories e.g. Vikner 1994. It seems possible that only 'bridge' verbs select for C[Echo].



Assume further that all inversion is into the upper C, C[/Echo], except that the inversion called for by *wh*-movement is to the lower C, C[/T]. The inversion feature, giving C^{inv} , will be imposed on the appropriate selected C by the ‘specifier’ i.e. by a W head for *wh*-questions, by Q for root questions, by the conditional head for conditional inversion (recollect that this selects for its host clause), and by the adjunct head for negative inversion.⁴⁶ Constraint (49), C^{inv} is unsplit, now ensures that the inversion does take place (rather than affixal PF-C lowering). Note that this means that all the environments in (73) to (75) except for *wh*-questions are asserted to be Echoic. This seems to us plausible, but again we would like independent justification, from the pragmatists. The only further restriction required is an ‘accidental’ gap, forbidding even echoic *-n’t* in example (74a). Since conditional inversion is in any case limited to *be*, *have* and *shall* in their conditional forms, an exclusion of the *-n’t* forms is not problematic.

The (a) and (c) examples in (73) to (75) are now accounted for. The (b) examples are unproblematic, in that the constraints we have discussed permit either a Pol[NEG] or an Echo[NEG] interpretation, as required.

If this explanation can be substantiated, it will provide strong support for our theory which explains the distribution of Aux/Modal displacement across negation, vs. the absence of V-displacement in terms of a [V] feature on Pol.

11.2 Formal Echo negation in questions

As well as the negation positions discussed in previous sections, there are occurrences like those in (77):

(77) **Why could not** more of the lectures be on the same day? (THES, 29/5/98)

(78) **Will not** this hypothesis be upheld? (Warner 1993:86)

⁴⁶ Aoun and Li (1993:232) distinguish two distinct categorial features for an interrogative head, Wh and Q, but assign them the same base position in the clause.

It has been suggested that the *not* is simply the pronunciation in full of the *-n't* morpheme. However, the distribution of uncontracted and contracted forms is not identical, as witness the conditional inversion in (79a) vs. (79b):

- (79) a Were not aloe so bitter, one might consume more of them
 b *Weren't aloe so bitter, one might consume more of them

We propose an alternative analysis. In section 9, we took it that the Infl-Precedence constraint (52) operated on the LF parts of the Infs. But it is plausible that the original motivation for the constraint was to do with information processing: the Infl carrying the maximum information should be presented to the listener first. This would lead to a pragmatically based PF constraint.

In a clause with inversion, the position of PF-Infl^T is with the modal, at C^{inv}. This means that if we interpret the Infl-Precedence condition as a PF constraint, the position of the Infl^{default} for Echo[NEG] is constrained only to be below C. Because Infl^{default} does not project for checking, it may be above the T to which it is related.⁴⁷ We will show that this not only explains the new position for *not*, but accounts for systematic gaps in the interpretive possibilities.

By the argument of section 11.1, the root question in (80a) will be associated with the array of heads in (80b), and the *wh*-question in (81a) with that in (81b).

- (80) a # **Should not** Theo have been singing? (Echo[NEG] only)
 b Q C^{inv} Echo C T Modal₁ Pol Aux ...
- (81) a Why **could not** more of the lectures be on the same day?
 b W Echo C^{inv} T (Modal₁) Pol (Modal₂/Aux) ...

Suppose in (80) or (81), we try to associate the *not* with Pol[NEG]. In order to satisfy the Raise and the Adjacency constraints, (50) and (51), the Infl^{default} for Pol should appear adjacent and above it; since there is no reason to deviate from this, the optimal position will not permit PF-Pol[NEG] to appear before the subject. This is the correct

⁴⁷ Normally, an Infl cannot be above its checker, since it would fall in the checking domain of a higher checker. (The checking domain of a checker is that region from which features could percolate for checking, subject to Minimality). However, there IS no higher checker here, so the Infl falls in the checking domain of T by default.

prediction for (80a), which only has an Echo[NEG] reading. For (81a), it is not possible to ascertain which NEG is present, so we will assume that the prediction that Pol[NEG] is uniformly impossible is correct. Now suppose the negation we have for example in (80) is Echo[NEG]. Under the PF-version of the Infl-Precedence constraint, the Infl^{default} associated with Echo may be immediately above Echo, satisfying the Raise and Adjacency constraints. This leads to the PF order shown by the examples. For (81), the Infl^{default} associated with Echo cannot be adjacent to it, because we have to satisfy the Infl-Precedence constraint. To satisfy the Preserve-Scope constraint (55), the Infl should be above T (LF-Echo has scope over LF-T). If we assume that subjects must, for other reasons, be immediately above T, then the Infl, and hence PF-Echo, will fall between C and the subject, as is required for (81a).

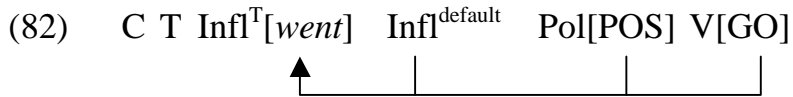
Given its success in accounting for the data, we assume that the PF version of the Infl-ordering constraint may still be used, although the grammaticalised LF version is preferred.⁴⁸

12 Pol[POS] and Adverb positions, and a Pollockian problem

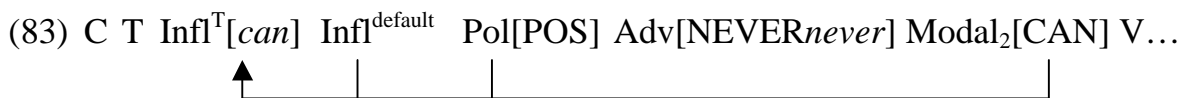
According to what we have argued so far, if Pol[POS] has a categorial V feature, then we should expect obligatory *do*-support in positive sentences with no other auxiliaries or modals. This is not correct. However, Pol[POS] is phonologically empty, so PF-Pol[POS] and PF-V might be merged in the same position. That is, just as the lexicon allows for PF-items such as *can't*, associated with Pol[NEG], Infl^T, Infl^{default}, and [V, Aux], so the lexicon could accommodate PF-items associated with Pol[POS], Infl^T, Infl^{default}, and V.⁴⁹ Such a PF-item would be merged at Infl^T, in accordance with the 'Raise' constraint, (49).

⁴⁸ Formal echo negation with Conditional inversion and Negative inversion is predicted to pattern as for Root questions. The unavailability of any *-n't* version of an Echo question, as (79b), may be regarded as due to accidental gaps, since only three Aux verbs (*be*, *have*, and *should*) can occur in the conditional form required for this kind of inversion.

⁴⁹ There are dialects where *do* is used without emphasis in declaratives. For these we assume that the lexical items suggested are absent (and that most speakers handle two dialects), so that *do* support is obligatory, or present but that the more complex form with *do* has some pragmatic import, so that it may be used in appropriate circumstances. See Bohnacker 1997 for evidence that both L1 and L2 learners optionally use *do* in all declaratives.



In fact, the expected interpretation of the feature notation would also allow a [V, Aux] item to be associated with Pol[POS] in the same way.⁵⁰ This would give rise to a structure such as that in (83), associated with sentences like (84).



(84) Tom can never eat strawberries

This is correct, in as much as (84) can indeed have a reading ‘It is never permitted for Tom to eat strawberries’, with the NEVER CAN scope order. This is not due to *never* being in Pol, since exactly the same displacement is observable if *never* is replaced by *sometimes*.

The possibility of an adverb position following Pol, together with the PF-displacement of PF-V to Infl^T above Pol, immediately confronts us with the problem of (85), with a putative analysis as in (85b).



We do have an answer to this problem, but we are not going to do more than sketch it here, since it would involve more theoretical background, and at least part of a theory of adverbs. Our proposal depends on the claim that contrary to what we have tacitly assumed, adverbs in English are not adjoined to maximal projections at all. They are left-adjoined at an X⁰ level, to any item with a categorial feature V, including auxiliaries, modals, and functional Pol, with Discourse orientated adverbs possibly adjoined to Echo.⁵¹ The PF of the resulting complex V⁰ may be merged in some

⁵⁰ We assume that the only reason that Pol[NEG] forms are restricted to association with [V, Aux] is that only [V, Aux] items contract, for reasons which are nothing to do with syntax.

⁵¹ If an adverb is adjoined to Pol, a displacement of Aux/Modal₂ across Pol will be to a position below the

position other than that of the LF. The LF position of lexical V is lower than that of the object (Cormack forthcoming), so that the PF-order in (85) cannot be derived.

13 Conclusions

We have argued that there are three kinds of negation relevant to the clause: Echo[NEG], Pol[NEG], and Adv[NEG], each with its characteristic selection requirements. All these have a categorial [V]feature; Pol is in addition a functional head (as probably is Echo). On the basis of this assumption we have accounted for a wide range of otherwise puzzling facts about the interaction of modals and adverbials with the scope of negation. We have further shown that 'strong features' is not the mechanism driving head-movement. Rather we have suggested a set of 'soft' (*ceteris paribus*) constraints on the distribution of features in a checking relation to account for the merge positions of the PF-parts of signs, and indeed for the splitting itself. Checking features seem to be confined to those for Infl-like elements (perhaps including agreement), which can be in a many-one relation to their checker, and parts of split signs, which must be related to the other part. We require percolation rather than movement, for the checking mechanism.

Although we have accounted for a great variety of phenomena, including both arbitrary and systematic gaps in the morphosyntactic distribution of negation, we have been obliged to omit discussion of negation in infinitives, imperatives and subjunctives. We leave these as an exercise for the reader, noting only that it is no longer clear that Pol is absent from infinitives. There is also a need to account for apparent main verb inversion in locative inversion (Bresnan 1994) and quotative inversion (Collins and Branigan 1997); these inversion cases are incompatible with Pol[NEG].

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adverb, as discussed under example (54).

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