Some Notes on Head Movement

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1. Introduction

1.1. The Issue: Chomsky's Critique

Since the advent of the Chomsky's Minimalist Program (MP), it has been widely claimed that traditional head movement (HM) is problematic for the minimalist hypotheses in several respects. Some (MP-internal) criticisms of head movement as traditionally formulated as adjunction onto a higher head are:[1]

1. It violates the Extention Condition: movement must target the root and extend the structure
2. The moved head doesn't c-command its trace (without amending the definition of c-command)
3. It violates the chain uniformity condition: under the Bare Phrase Structure (BPS) hypothesis the moved category is a head in its base position, but after moving, since it doesn't project, it is a phrase.
4. It violates the A-over-A hypothesis: e.g., if a probe attracts [+V] it should be the maximal V (i.e., the VP) that moves.
5. It violates anti-locality under some formulations, although as Dékány notes, this is not uncontroversial.
6. If movement is triggered by (uninterpretable) features, then head movement needs a special type of feature, different from movement to the root (Spec position).

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[1] After Dékány (2018), p.5 ff.

Gisbert Fanselow's Contributions to Syntactic Theory, 255–270
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7. HM complicates checking domain: spec-head for phrasal categories, adjunction for HM.

8. HM does not seem to affect semantic interpretation.

Chomsky (2001) broached the possibility that many "head-raising" phenomena may fall outside core syntax and be located in the phonological component. This has unleashed two decades of syntacticians either (1) trying to demonstrate that HM does in fact belong in core syntax or (2) trying to "fix" HM so that it doesn't violate the above restrictions. (It should be noted that not all syntacticians find HM problematic – long HM within a clause in verb-second languages comes to mind, even though it is only associated with the meaning in changing a subordinate to a main clause.)

The purpose of this squib is to draw attention to three sets of phenomena which may be construed as evidence against objection 8, i.e., cases of HM which are associated with meaning change, hence must take place in core syntax, which feeds LF. There have been several other attempts to demonstrate this, for example Lechner (2007), a concise summary of which is in Roberts (2010), who makes his own argument: V-fronting of a negative Aux over a subject licenses NPIs. Arguments involving changing scope are attested, Matyiku (2014, 2017) examines a scope change in dialectal English. For other references and challenges, see Dékány (2018), p.33 ff. In view of the plethora of arguments in the literature, one hopes that the arguments below don't replicate similar arguments in various languages that have already been discussed.

1.2. Gisbert's Take

The genesis of this squib was twofold: Gisbert's (2009) approach to fixing HM technically by reprojection, and an old paper of mine, Thiersch (1981), based on a 1974 article by Mark Liberman.

It should be noted that the arguments here turn on the assumption that head movement is a uniform phenomenon, and hence is either in the core syntax or not in core syntax but rather a phonological process. There have been several recent approaches which note that there seems to be evidence on the one hand that many cases of "head movement" seem to behave as though HM is a syntactic rule, but nevertheless has phonological exponence, and so propose that HM is not a unified process but should be split into two different processes; e.g., Harizanov & Gribanova (2019), Svenonius (2016, 2018) and

following work for the concept of *span*, and Bayer (2023, esp. § 8-9, & *in preparation*) for an approach splitting the syntactic movement (features) and the phonological material (in part by epenthesis).

Rather than evaluating these proposals, I concentrate here on the empirical evidence for interaction with syntax/semantics, focussing on auxiliary movement creating new configurations where other syntactic and semantic operations can take place.

2. Negative Inversion in English

2.1. Evidence that Negative Auxiliaries are "Words"

The first set of data involves so-called subject-aux-inversion (SAI[2]) in English involving negative auxiliaries in various contexts (as opposed to "Negative Inversion" discussed by Matyiku (see below), which involves movement of only the auxiliary verb in declarative sentences).

The first not entirely uncontroversial assumption is that negative auxiliaries in English are *words*, i.e., heads, going back as far as Zwicky & Pullum (1983). While we can't go into all of the evidence in this complicated controversy, one can cite one piece of evidence that negative so-called "contractions" are simply a set of negative auxiliary verbs (as opposed to real contractions like *could've*, which have a different behavior), namely that some negative auxiliaries have suppletive forms:

(1) a. will + not → won't
    b. do [du] + not → don't [do:nt]
    c. must + not → mustn't [mʌsənt]

2.2. Some New Cases in English

2.2.1. Scope Inversion

A case noted some time ago in Williams (1994a), is that movement of *mustn't* causes change in the availability of scope readings [his (14) & (37)]:

(2) a. John mustn't be there (necessity > not)
    b. Mustn't John be there (not > necessity)

[2]SAI is used throughout as a term of convenience for similar constructions in English, Bantu, and Warlpiri involving alleged head movement of a finite verb to a (second) position and the fronting of another constituent (or constituents) to its left.

While much has been written in the mean time about the fact that combinations of modals with negation don't reflect the surface order, in this case movement *changes* the relative scope. We need to distinguish between the deontic (volitional) reading and the epistemic (existential) reading. Francis (2017) cites deontic *must* as a modal which obligatorily scopes over negation. But if we limit ourselves to the deontic reading it would seem that the first indeed means that it is obligatory that John attend, whereas the second questions whether it is not the case that John is obliged to attend.[3] I think it is even clearer with *can*:

(3) a. Fred can't be there
→ Either "he can't attend" (deontic) or "he's probably not there" (epistemic)
b. Can't Fred be there?
→ Strongly preferred reading: the speaker is asking if he can attend (volitional/deontic); *Isn't he present?

So while this needs to be tested with other speakers and other verbs, for our purposes, in agreement with Williams, SAI changes the meaning, in this case one of the readings is lost. (See similar examples below.) [4]

Williams himself proposes a solution to (2) in which the *musn't* in the (a) example is *must* + *not* like *could've*, whereas in the (b) example, it is a negative auxiliary as in (1-c). Being created by word-formation, in this *musn't* the negative is the head of the word, and hence has wide scope. This is is not obviously applicable in general to other cases: as we will see below the phenomenon is more pervasive.

[3] At least to this (former?) native speaker.

[4] It should be noted that, in a recent comprehensive article, Jeretič & Thoms (2023) (henceforth: J&T) discuss the relation between quantifier scope and "movement". However, although they cite Roberts' (2010) defense of HM as a syntactic phenomenon, they go on to present a mechanism of scope determination *in situ* without "movement". However, Roberts was defending *overt* movement as a syntactic operation, and in their analysis they are primarily concerned with *covert* movement, i.e., QR; i.e., they are discussing mod-over-neg movement, as oposed to SAI. It remains to be seen if their system for determining quantifier scope with respect to negation can correctly derive the effects noted in (2) above and the following cases discussed below; indeed they assert their approach predicts the scope facts to be "largely insensitive to the variety of syntactic configurations of negations and modals" (p.45), which would seem to contradict the data discussed here.

For example, Potsdam (2013) in discussing scope in general, cites a case where the scope of negation follows the auxiliary inversion [his (19)]:

(4) Don't at least two women candidates realize they are being used to split the vote?
   a. Is it not the case that at least two women candidates realize that they are being used to split the vote? NEG > AT LEAST 2
   b. *Are there at least two women candidates who don't realize that they are being used to split the vote? *AT LEAST 2 > NEG

Cf.:

(5) At least two women don't realize they are being used to split the vote.
AT LEAST 2 > NEG [*my example, CT*]

What is relevant for us is that the scope seems to track the structure in the case of inversion (HM), i.e., the HM must take place in the syntax to feed LF.

2.2.2. Missing Scope

As mentioned above, Matyiku (2014, 2017) discusses another case where just the HM of the auxiliary affects scope: in certain American dialects from Apalachia through the Southern states to Texas the following declarative sentences alternate [her (1.8)]:

(6) a. Don't many people like you!
   b. Many people don't like you.

The (a) sentence is *not* a question, is spoken with a falling intonation and has the interpretation "There aren't many people who like you." [The present author can attest to this from friends, and has heard the construction often on TV.] Matyiku's point is that here as well, the logical scope tracks the surface structure, so HM affects LF.

A similar but not identical case, long known and discussed in the generative literature, is the aforementioned observation by Liberman (1974), that Negative XP Inversion (which involves SAI) also affects the scope in a surprising way.[5] A sentence like (7-a) has two readings, (c) and (d):

[5] See discussion of Liberman (1974) in Pullum & Wilson (1977) § 2.1, p.7 ff. It should be noted that these readings in (7-a) are also linked to the intonation.

(7) a. Fred would be happy with no job.
b. Rough mapping of syntactic structure:
Fred$_i$ BE (e_i happy) (e_i with NO job)
c. Narrow: ($\forall$ j, Job(j), $\neg$ WITH (F, j)) $\rightarrow$ HAPPY(F)
$\Rightarrow$ Fred is happy to be unemployed
d. Wide: $\neg(\exists$ j, Job(j) s.t. (WITH (F, j) & HAPPY(F))),
or equivalently $\forall$ j, Job(j), $\neg$ (WITH (F, j) & HAPPY(F))
$\Rightarrow$ Fred is unsatisfied with every job

Ignoring the details of how the wide and narrow scope are calculated from something like (7-b), interesting for us is the peculiar long-known fact involving fronting of the negative PP:

(8) a. With no job, Fred would be happy = (7-c)
b. With no job would Fred be happy = (7-d)

With no SAI the sentence has ONLY the interpretation with the negative having narrow scope over the PP, while the sentence with SAI has ONLY wide scope negation.

It perhaps comes as no surprise that (8-a) has only the narrow scope reading; from the intonation and lack of "subject-aux-inversion" (SAI), it seems clear that the PP is in some sentence external position.[6] What is surprising is that the sentence with SAI has lost with narrow scope reading, and has only the reading with wide scope of negation.

It has been noted in the (semantic) literature that in fronted negative phrases negation outscopes everything else.[7] Here it isn't the SAI *per se* which causes the change in meaning (loss of narrow scope), but the direct (moved) presence of elements in some left peripheral projection, perhaps Spec,FocP, in Rizzi's terms. Summarizing,

(9) a. "Base" structure: [$_{\text{XP}}$ ... V ... ZP] has two interpretations, perhaps due to different positions of ZP.

[6] Ott (2014) suggests parataxis with deletion, but this is perpendicular to our concerns here.

[7] Cf. Potsdam (2013) among many others. However, J&T note that Francis (2017) presents evidence that necessity (*must*) may under certain circumstances scope higher: "At no point must the server's feet move in front of the baseline [...]" J&T, p.16, (32). Discusssion of the details goes beyond this squib; it's sufficient for our argument that the inversion in (8-b) *loses* the other scope interpretation. As mentioned, in Williams (1994b) this is due to the the fronted elements now being the "head" of the construction; how this should be stated in modern terms is unclear.

b. After SAI: [$_{YP}$ ZP [$_{V^0}$ V_i] [$_{XP}$ ... e_i ...] has only one interpretation.

So for the argument here, if the FocP (YP) is built in the core syntax, the finite verb – or some of its features, as in Bayer (*op cit.*) – moves in the syntax to licence the projection.

2.2.3. Conditional Inversion

A final case of SAI influencing the meaning comes from Bhatt & Pancheva (2006). There are two types of conditionals (in English, German, etc.): the *if*-type, with no SAI, and bare condionals whose status as a conditional is determined by SAI (in English; verb-second and subjunctive tense in German). Bhatt & Pancheva note, building on Iatridou and Embick (1994), that the two have somewhat different meanings. The implied extension of the *if*-clause can be temporarily "cancelled" and resumed by a positive statement; a SAI conditional cannot be "cancelled" and hence sounds infelicitous in such contexts [their (63)]:

(10) If he had broken his leg in his childhood, which, in fact, he did, he would have exactly this type of scar.

(11) #Had he broken his leg in his childhood, which, in fact, he did, he would have exactly this type of scar.

Here the SAI clearly influences the interpretation, marking the sentence as a conditional *and* causing a different interpretation as a non-cancelable given.

There are two other potential cases which deserve to be mentioned: Bantu and Warlpiri.

3. Bantu

An entirely different kind of syntactic interaction with (syntactic) SAI is found in certain Bantu languages. In fronting non-subject constituents, the auxiliary verb appears to the left of the subject, and agrees not with the subject, but with the fronted constituent. Here is an example from the Bantu language Kilega, showing WH-in-situ (a) and fronted WH (b):[8]

(12) a. Bábo bíkulu **b**-á-kás-íl-é mwámí bikí mu-mwílo?
2that 2woman 2SA-A-give-PERF-FV 1Chief 8what 18-3villiage
"What did those women give the chief in the village?"

[8] SA = Subject agreement, CA = Complemetizer agreement.

b. Bikí **bi**-á-kás-íl-é bábo bíkulu mwámí mu-mwílo?
8what 8CA-A-give-PERF-FV 2that 2woman 1chief 18-3village
(from Carstens (2005) [her (1)])

This also extends to long-distance fronting:

(13) Bikí bi-á-ténd-ílé bána bi-á-gúl-ílé nina-bó?
8what 8CA-A-say-PERF 2child 8CA-A-buy-PERF mother-their
"What did the children say their mother had bought?"
(Carstens (2005) [her (47)])

On first glance, this would appear to be a straightforward case of a finite verb moved to C^0 and agreeing with the constituent in Spec,CP, hence supporting the claim that the movement of the head (or at least its features) is in the syntactic component.

However, as Carstens notes, Spec-Head agreement has been banished from the Minimalist program, and replaced by (long distance) Agree under c-command, accounting straightforwardly for formerly problematic examples like (14):

(14) There $\text{seem}_{\text{plur}}$ to be some $\text{mice}_{\text{plur}}$ in the bathtub.

One might suppose that, under this assumption, Agree takes place between the tensed verb and the object while it's still in Spec,vP (otherwise the actor subject ought to be an intervenor by Minimality). But looking more careflully at (13) and more complex examples like (15), a different picture emerges [Carstens (2005), fn.7, p.228]:[9]

(15) Bikí$_i$ by-éte bí-ku-ténda bána bi-tw-á-kít-ílé e_i
8what 8CA-ETE 8SA-KU-say 2child 8CA-IPL-do-PERF
"What are the children saying we had done?"

As one can clearly see in (15), the WH-phrase *bikí* (class 8) has moved to the Spec,CP position via vP-CP-vP, triggering agreement along the way as in Dinka; cf. van Urk (2005). And the subject *bána* has stayed verb-phrase internal. As Carstens puts it, no subject or other non-WH XP (e.g., a locative as in the inversion construction) can appear in Spec,TP, otherwise there would indeed be a Minimality intervention effect. Hence we might assume that the

[9]ETE = aspectual auxiliary.

Aux (or its features) are in C^0 triggering agreement, here not via Spec-Head agreement but by c-commanding the WH-phrase in the matrix vP before it moves to Spec,CP [∼ her (9), p.223].

(16) $[_{CP}\ XP_i[+WH]\ [_{C^0}\ t_j[\underline{\phi_i}]]\ [_{TP}\ T^0_j\ [_{vP}\ \mathbf{e}_i\ [_{vP}\ DP_{subj}\ ...\ e_i\ ]]]]$

Here t_j represents the head corresponding to T^0_j and its features [ϕ] (here: class) agreeing with the boldfaced trace[10] $\mathbf{e}_i$ adjoined to the matrix vP, leaving open whether the whole T itself moves or just its features, as in Bayer (*op cit.*). It should be noted that Carstens (2005) subsequently argues for a non-movement analysis: she treats the verbal *prefixes* as independent heads, so agreeing C^0 is base-generated and amalgamated with the verb in the phonology. (Hopefully, future research will resolve the conflict.)

4. Warlpiri

The last case involves the Australian language Warlpiri, which also exhibits second position phenomena. Traditionally, since Hale's (1983) analysis, Warlpiri has been assumed to have non-configurational "free word order" with the initial tense/mode/clitic-pronoun cluster usually appearing in second position (it needs to cliticize on the first XP, and is a typical "second position" phenomenon, like Germanic verb-second).

However, Legate (2001, 2002) and Laughren (2002) have shown that there is nevertheless hierarchical structure in the clause: in addition to various positions in the "Mittelfeld"[11], i.e., after the Aux-position, that there are at least two distinct sentence initial positions, as in the German example in (17):[12]

(17) Den Mann, den kenne ich nicht
the man him know I not
"I don't know that man!"

Although Legate presents evidence for a complex left-peripheral hierarchy, for the purposes of this argument, we simplify and consider just two, the topic and

[10] As Jan Koster once said, "Old habits die hard"; in Minimalist terms, a copy of the WH-phrase is externally merged here.

[11] "Middle field": The area between the finite verb or complementizer and the final verb cluster in German and Dutch.

[12] Cf. Rizzi (1997).

focus positions. As in many other languages, when both are present, the first, P1, is a topic, the second, P2, usually a focus position; cf. Malagasy:[13]

(18) Ity radary ity dia ny Rosiana no nanan azy
this radar this TOP the Russians FOC PST.AT.have it.ACC
"As for this radar it was the Russians who had it."

As in Malagasy, the situation is further complicated by the presense of certain "Vorfeld"[14] adverbs in Warlpiri, which can intervene between these positions, such as the bound morpheme *-lku* ("then"),[15] which is repeated if a DP is split (a), and the free adverb *marda* "perhaps", which can cause the Aux-complex to appear in third position (b):

(19) a. Walyka-**lku** ka ngurrju wangka-mi-rni payi-**lki**
cold-**now** PI[16] good blow-NPST-hither wind-**now**
"a nice cool breeze is now blowing my way"
(Legate (2001), (35b))

b. Ngurrju-ngku-**lku marda** ka-ju,
good-ERG-now perhaps PI-1SG.OBJ
yarnirnpa-wangu-rlu-lku marda nya-nyi-rni.
unwilling-without-ERG-now maybe look-NPST-hither
"Approvingly perhaps now, not unwillingly perhaps now, she's looking my way"[17] (*ibid.* (39))

As Legate points out, the "AUX" (generated in situ in TP) generally moves to X^0 of the highest projection which is present, excluding the "hanging topic" posisition. So in a sentence without position P1 or the "Vorfeld" adverbs, we

[13]Keenan (1976); he originally translated *nanan* with 'do'. We leave aside the complex arguments about the structure of the sentence following *no* [nu].

[14]"Vorfeld" (prefield) refers to the constituent(s) left of the finite verb in German and Dutch. Although generally limited to exactly one, there are exceptional cases and much current research is being devoted to the conditions under which this can occur, see G. Müller (2018) and references therein, as well as Bildhauer (2011). Evidently, the same applies to Warlpiri.

[15]Recall that the Aux-complex is phonologically bound to the preceding word. Following Legate, I've underlined it in the examples.

[16]PI=Present Imperfective, not to be confused with positions indicated by P1 and P2; NPST = Non-Past.

[17]Legate also gives the translation "She's looking my way perhaps approvingly now, perhaps not unwilling (to have me) now." Note the *ka-ju* is missing from the second clause and the verb from the first clause. A case of Warlpriri ellipsis?

can see that the AUX cluster usually appears after P2, but if P1 is realized, it moves to a position after P1. We can see this because, as in German, the same word can be either a question word or an indefinite pronoun, depending on whether it is in the focus position P2 or in the "Mittelfeld":

(20) a. **Was** hast du dem Hans zum Geburtstag geschenkt?
what have you the-DAT H. to-the birthday given
"**What** did you give Hans for his birthday?"

b. Zum Geburtstag hat auch Susanna dem Hans **was** geschenkt.
to-the birthday has also S. the-DAT H. what given
"For his birthday Susanna also gave Hans **something**."

Warlpiri is similar [from Legate (2002), (276)–(277); *-rlangu* = 'for example']:

(21) a. **Nyiya**-rlangu kaji-ka-lu nyina
what-e.g. PC[18]-PI-3PL be.NPST
wampana-piya-ju?
spectacled.hare.wallaby-like-TOP
"What ones for example might be like the spectacled hare wallaby?" (Hale field notes)
→ **nyiya** in Spec,FocP

b. Kaji-lpa-ngku wanti-yarla **nyiya**-rlangu milpa-kurra …
NfactC-PastImpf-2sg fall-Irr what-e.g. eye-All …
"If something were to fall into your eyes …" (Warlpiri Dictionary Project 1993; cf. English "Were something to fall …)
Not: *"What might have fallen into your eyes?"
→ **nyiya** in "Mittelfeld"

In the following example, the first constituent is a topic followed by the AUX *-npa*. However, the only interpretation is as a WH-question, indicating that *nyarrparla-* is in P2 (Spec,FocP) and not in the "Mittelfeld", hence the AUX *-npa* has moved to the head position behind P1 (Spec, TopP) [Legate (2002), (278) from Laughren (2002), (24)]:

[18] PC = Potentiality Comp; *pija* = 'like', Legate had "?"

(22) a. Pikirri-ji=npa **nyarrparla**-rla
spearthrower-TOP=2SG where-LOC
warungka-ma-nu-rnu?
forget-CAUSE-PST-hither
"Where did you forget the spearthrower on your way here?"
→ Schematically [$_{\text{TopP}}$ XP[+top] AUX$_i$ [$_{\text{FocP}}$ YP[+WH] e_i [...

b. A better paraphrase indicating the discourse functions might be "As for the spearthrower, where did you forget (it) ..." [CT]

Although previous analyses have claimed that the positioning of the Aux-complex is phonological,[19] Legate argues that it involves movement from one position to another in (22-a). That is, it at least moves from its normal position in the head of FocP, to the head of TopP. Of course this is just suggestive, and a lot depends on assumptions, for example how the interpretation of *was* in German is determined, and a more detailed study of left peripheral positions in Warlpiri. Various complications have been glossed over here, such as the position of the "Vorfeld" adverbs, cf. (19)), but this seems to be a perpendicular problem, if anything strengthening the case that the Aux has moved in the syntax.

5. Possible Solutions

If the above cases (and the others mentioned) indicate that HM (at least finite verb movement) is in core syntax, then one needs to extend the assumptions of the Minimalist program. Many of these are discussed in Dékány (2018), such as interarboreal movement (Bobaljik & Brown 1997), remnant movement (G. Müller 2004), and reprojection (Surányi 2005, and of course Fanselow 2009), plus splitting head movement phenomena into syntactic and phonological processes as mentioned earlier. In this light, Richards (2016) deals with HM (chap. 4) and suggests the issue may be mute if phonology and syntax operate in parallel. We leave discussion of these to a future article.

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[19] Cf. Hale (1983).

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