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LF-movement of pronouns

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1. Introduction

In the literature on LF-movement of anaphors, it is often suggested (Lebeaux (1983, 726), Chomsky 1986, 175) that the movement at LF is identical to the S-str movement of reflexive clitics in Romance. An issue that immediately arises is: Why do both reflexive and pronominal clitics move at S-str, but only reflexives at LF?

One answer is that pronouns indeed move at LF in the same manner as reflexives. In this paper I present a theory that incorporates this possibility. The main empirical consequence that follows is that Norwegian pronouns have a property I will call anti-subject orientation, whereas this property is absent in English. Anti-subject orientation in Scandinavian was first discussed by Vikner (1985), and can roughly be described as follows:

(1) A pronoun is anti-subject oriented if it must be disjoint from the next higher subject, even if this subject is outside the binding domain of the pronoun

The presence of this effect in Norwegian and its absence in English can be illustrated as follows:

(2) $John_i$ ba Per_j fortelle Ola_k om $[_{NP}$ $hans_{i/*j/k/l}$ kone]
'John asked Peter to tell Ola about his wife'

Whereas in the English gloss, his is free to be coindexed with any c-commanding NP outside the containing NP, the Norwegian pronoun differ in that it must be disjoint from the next higher subject, Per. The same point can be illustrated in (3):

(3) $John_i$ ba Per_j kikke $[_{PP}$ bak $ham_{i/*j/k}]$
'John asked Peter (to) look behind him'

I assume that the PP is here the binding domain for the pronoun (cf. Hestvik 1989). Again, the pronoun must be disjoint from the first subject outside this domain, Per, but may be coreferential with the higher subject John.

If there is a subject inside the domain of the pronoun, disjointness from that subject satisfies the anti-subject requirement:

(4) $John_i$ bad $[_S$ Ola_j slå $ham_{i/*j}]$
'John asked Ola (to) hit him'

Finally, if a tensed S boundary intervenes between the pronoun and the subject, there is no anti-subject orientation, i.e. the pronoun may be coindexed withn the subjacent subject:

(5) $John_i$ tror at han_i er smart
'John thinks that he is smart'

The proposal has three components, which interact in a way that yields the empirical differences observed between Norwegian and English. They are (i) a generalized LF-movement theory, (ii) a particular definition of binding domain, and (iii) condition B application at S-str and LF. The core of the explanation will be that the ungrammatical coindexations between pronouns and subjects in Norwegian are induced condition B violations at LF.

2. The theoretical proposal

Pica (1987) proposed that there are two types of anaphors: Anaphors interpretable as heads (X0) by the grammar, and anaphors interpretable as XPs. X0-anaphors move to INFL at LF, whereas XP-anaphors adjoin to the immediately containing XP. Suppose that this division also holds for pronouns:[1]

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[1]This possibility was also raised in Pica (1987, 496, fn.11).

(6) Pronouns and anaphors divide into two types:
(i) X0-anaphors and X0-pronouns
(ii) XP-anaphors and XP-pronouns

The proposal is that Pica's LF-movement theory be generalized as follows:

(7) a. X0-pronouns/anaphors must move to INFL at LF
b. XP-pronouns/anaphors must move to the Spec of their governor at LF

Why does this movement have to take place? I hypothesize that anaphors and pronouns are operators at LF (cf. Bach and Partee 1980, Enc 1989), and that they therefore must occur in operator positions for scope reasons. X0-operators must then be interpreted in X0-positions, and XP-operators in XP-positions.

Furthermore, I assume the following definition of binding domain, call it domain D:

(8) a. Domain D(x) $=_{def}$ the minimal Complete Functional Complex containing x
b. CFC $=_{def}$ the minimal maximal category containing all the realized arguments of an argument taker

Conditions A and B are defined as follows:

(9) a. Condition A: x must be bound in D(x)
b. Condition B: x must be free (not bound) in D(x)
c. x binds y $=_{def}$ x c-commands and is coindexed with y

Notice that there are now two interacting factors: First, both pronouns and anaphors move in order to satisfy the requirements in (7). Second, since movement is free, anaphors may move successive cyclically in order to satisfy condition A. Hence anaphor movement will typically be longer than pronoun movement.

What are the constraints on the movement? X0-pronouns may move successive cyclically head-to-head, not obeying the Head Movement Constraint (which I assume is restricted to movement of bound morphemes). Apart from the normal requirement that the moved element must bind its trace, I will assume the following ad hoc condition:

(10) LF-pronoun movement cannot cross a tensed CP

Hence, a pronoun or anaphor cannot cross a tensed CP in

order to satisfy (7).[2] Finally, I assume that condition B must (crucially) apply at both S-str and LF:

(11) Condition B must be satisfied at S-str and LF

In other words, a pronoun which requires condition B satisfaction must satisfy condition B at both S-str and LF, in other words, twice. Satisfaction at one level does not guarantee satisfaction at the next level. With this theoretical machinery I will now show how the differences between English and Norwegian follow.

3. Norwegian pronouns are X0s, English pronouns are XPs

There is evidence that Norwegian pronouns are interpretable as X0s, while English pronouns are only interpretable as inherent maximal projections; XPs. In other words, the structure of Norwegian pronouns is (12a) while English pronoun have the structure (12b):[3]

(12) a. Norwegian pronouns: $[_{NP}\ [_{N'}\ [_{N0}$ ham]]]
b. English pronouns: $[_{NP}$ him]

The evidence for this difference is that Norwegian pronouns freely allow restrictive modifiers, while this is impossible in English, as the ungrammaticality of the glosses illustrate:

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[2]Condition (10) is not entirely reducible to the ECP, since there is no contrast between (i) and (ii):

(i) John thinks that himself is happy
(ii) John thinks himself is happy

In (ii), there would be no that-t violation, and if that deletes at LF, antecedent government should be facilitated. Rather, the TSC seems related to "improper movement," given the similarity between the S-str (iii) and the LF (iv):

(iii) $John_i$ was thought $[_{CP}$ that t_i is happy]
(iv) $John_i$ [$himself_i$ thinks $[_{CP}$ that t_i is happy]

Notice also that the definition of local domain in fact forces the anaphor to move to the higher CFC in (iii). Under the BT-compatibility algorithm (Chomsky 1986), nothing prevents the domain from being extended for the anaphor in embedded subject position, and obligatory movement must is stipulated.

[3]Under the DP-hypothesis of Abney (1987), English pronouns would presumably be DPs while Norwegian pronouns would be D0s.

(13) a. han med rød hatt
'he with the red hat'
b. hun som går der
'she that walks there'
c. de som ikke har penger...
'those who don't have money'
d. han oppå taket
'he on-top-of the roof'

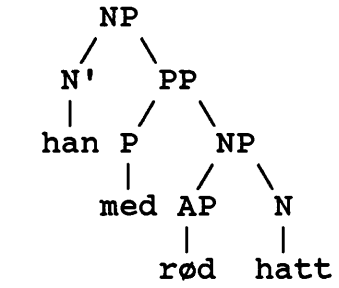
Postal (1966) discusses cases like (14):

(14) a. we who are opposing Fascism ...
b. you who wish to survive had better shape up

However, as pointed out to me by D. Seely, this is restricted to 1st and 2nd person pronouns in English. 1st and 2nd person pronouns seems to have their reference intrinsically a priori established, hence (14a,b) cannot be restrictive modification.

The facts in (13) follows from the representation of Norwegian pronouns in (12a). Since there are intermediate projections, and assuming restrictive modifiers to be sisters to N', these expressions can be assigned an analysis as in (15):

(15)



The impossibility of this in English cannot be a fact of universal semantics, given that it is possible in Norwegian. However, it would follow if English pronouns were inherently maximal projections: There would be no place to stick the restrictive modifier.

Note also that this shows that a simple criterion such as 'monomorphemic' or 'non-compound' does not suffice to distinguish X0-pronouns from XP-pronouns, since both the English 'he' and Norwegian 'ham' are monomorphemic, yet, only the latter is an X0.

4. Empirical consequences

I will now show that the difference in X0-hood vs.

XP-hood of pronominals, coupled with the LF-movement outlined above and the assumption that condition B must be satisfied at LF, will have the differences between English and Norwegian noted in the introduction as a consequence.

4.1 Basic cases

Consider first some simple examples, such as the S-str (16) in English.

(16) $Bill_i$ thinks $[_{S1}$ $John_j$ [likes him_k]]

Condition B applies at S-str. In order to check condition B, domain D(him) must be computed. D(him)=S1, hence him must be free in the clause, requiring that k<>j.

Since the English pronoun is an XP, it must be in the Spec of its governor at LF. Since it is not in this position at S-str, it must be move to this position in the mapping between S-str and LF. This yields the LF (17):

(17) $Bill_i$ thinks $[_{S1}$ $John_j$ $[_{SpecVP}$ him_k $[_{V'}$ likes $t_k]]]$

Again, condition B must be satisfied. D(him) is the CFC containing the pronoun, which is still S1. Since him is free in this clause, the structure is legitimate, and the pronoun may be freely coindexed with e.g. the next higher subject.

Consider now the parallel case in Norwegian, with the S-str/LF pair (18):

(18) a. Per tror $[_{S1}$ John liker ham]
'Peter thinks John likes him'
b. Per tror $[_{S1}$ John I-ham_i $[_{VP}$ liker $[_{NP}$ $t_i]]]$

The computations will be the same as in the English example: D(ham) will in both cases be the lower S, requiring the pronoun to be free in the lower S at S-str and LF. However, it may be bound by anything outside the lower S.

Recall from the introduction that there is no anti-subject orientation in Norwegian if the pronoun is the subject of a tensed complement clause, i.e. the pronoun may here be freely coindexed with the higher subject:

(19) $John_i$ tror at han_i er smart
'John thinks that he is smart'

The standard assumption in the literature is that INFL is in C in Scandinavian. Hence, the pronoun in (19) adjoins to C, and the coindexed higher subject is still outside the binding domain of the pronoun, assuming that CP can function as a domain D.

So far the application of the theory only yields trivial results, since the LF-movement occurs within the same local domain across S-str and LF. Let us now turn to the non-trivial cases, which has the essential character that the movement carries the pronoun into a different binding domain at LF than it was in at S-str.

4.2 Possessive pronouns

Consider first the cases involving possessive pronouns. (20a) is an S-str:

(20) a. $John_i$ liker $[_{NP}$ hans$*_{i/j}$ bilder]
'John likes his pictures'

At S-str, D(hans) is the containing NP, since the NP is the minimal CFC containing the pronoun. Since a pronoun is always free under any coindexing in this position (cf. Huang 1983), condition B is satisfied at S-str.

However, since the Norwegian pronoun is an X0, it must occur in INFL at LF. In order to fulfill this requirement, it moves to the closest c-commanding INFL, yielding the LF (20b):

(20) b. $[_{S1}$ $John_i$ I-hans$_{*i/j}$ liker $[_{NP}$ t bilder]]]]

What is the domain D(hans) at LF? The minimal CFC containing hans is now S1. Notice that it doesn't have to be the case that hans is assigned a th-role in S2 in order to be "contained in" this CFC, for the purposes of domain D computation. Hence, hans must be free in S1, and in particular disjoint from Per. On the other hand, if the pronoun is contraindexed with Per in (20b), the structure is legitimate.

Thus the anti-subject orientation property follows as a condition B violation at LF. Note that this result crucially requires that condition B applies at LF, since condition B is satisfied in the S-str (20a).

Notice that the movement to INFL is obligatory: The pronoun cannot choose not to move to this INFL, say, in order to avoid the upcoming condition B violation.

Another way to look at it is to say that if the pronoun does not move, then the requirement that it be in INFL by LF will be violated.

Consider on the other hand the English possessive pronoun. At S-str, the representation is (21), and his is free in D(his)=NP, under any coindexing, including the one illustrated:

(21) $John_i$ likes [his_i picture]

Since the English pronoun is an XP, it must be in the Spec of its governor by LF. Since the pronoun is already in the Spec of its governor at S-str, there will be no LF-movement; the LF is identical to the S-str:

(22) LF: $John_i$ likes [$_{NP}$ his_i picture]

Again, domain D(his) is the NP, and condition B is trivially satisfied at LF. Hence, the pronoun may be freely indexed with the higher subject John.

4.3 Pronouns in locative/directional PPs

Another case illustrating anti-subject orientation in Norwegian and its absence in English is when the pronoun is embedded in a locative or directional PP.

(23) a. $John_i$ looked behind $him_{i/j}$
b. $John_i$ glanced behind him_i
c. $John_i$ kikket rundt $ham_{*i/j}$
'John looked aorund him'
d. $John_i$ kikket bak $ham_{*i/j}$
'John looked behind him'

I argue in Hestvik (1989, 1990) that such PPs constitute CFCs, hence binding domains for pronominals. Recall from the definition of local domain that there is no subject requirement. Hence D(him) in (23) is the PP, and condition B is satisfied at S-str. The same applies to the Norwegian example. Consider now the corresponding LF-representations:

(24) a. $John_i$ looked [$_{SpecPP}$ him_i [$_{P'}$ behind $\underline{t}_i$]]
b. *$John_i$ I-ham_i kikket [$_{PP}$ bak $\underline{t}_i$]

In (24a), the pronoun is still in the same local domain, namely the PP, hence condition B is satisfied at LF even if the pronoun and the subject are coindexed. However, in (24b), domain D(ham) is different from domain D(ham) at S-str: The LF domain is the whole clause. Since

condition B must be satisfied at LF, this means that the pronoun must be disjoint from the subject in this domain, hence ungrammaticality of (24b). If the pronoun is contraindexed with the subject, the representation is wellformed:

(25) Ok $John_i$ $I\text{-}ham_j$ kikket $[_{PP}$ bak $\underline{t}_j]$

The anti-subject orientation is local, since that coindexation with a more distant subject is grammatical:

(26) Per_i bad John kikke bak ham_i
'Peter asked John (to) look behind him'

This is predicted by the theory since at LF, the pronoun is in the intermediate INFL, and stays there:

(27) LF: Per_i bad [$John_j$ $I\text{-}ham_i$ kikke bak $\underline{t}$]

The binding domain of <u>ham</u> at LF is the bracketed constituent, and since <u>Per</u> is outside it, coindexation with <u>ham</u> is legitimate.

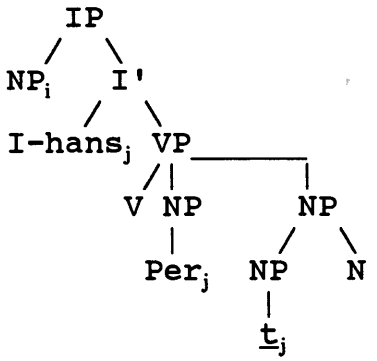
4.4 Predicting intermediate object binding

Consider next the fact that in Norwegian, the possessive pronoun may be coindexed with the subjacent direct object, as in (28), even though it must be disjoint from a higher subject:

(28) a. $John_i$ fortalte Per_j om $[_{NP}$ $hans_{*i/j/k}$ kone]
'John told Peter about his wife'

This poses a particularly interesting question for binding theory: How can one specify the binding domain for the pronoun so that it includes the higher subject but not the closer object? In fact, this property follows from the theory presented here. Consider the LF-representation of (28):

(29) LF of (28):



As usual, the pronoun must be disjoint from the matrix subject at LF, since coindexation would violate condition B at this level. But what about the direct object Per? Coindexation between the pronoun and Per does not violate condition B for the pronoun, since it is not c-commanded by Per. Furthermore, condition C is not violated, on the assumption that condition C does not apply at LF:

(30) Condition C does not apply at LF (cf. Chomsky 1981)

Hence, the coindexation between hans and Peter will not violate binding theory,[4] predicting the possibility for intermediate object binding in Norwegian.

The possibility for intermediate object binding can also be replicated in the locative PP context, but in this case more complicated constructions are required to bring this property out. The prediction is that (31) should be grammatical, since at LF the pronoun in INFL is outside the domain of the direct object Peter:

(31) a. John satte Peter$_j$ foran ham$_j$
'John put Ola before him'
b. LF: John I-ham satte Peter [foran t]

However, no syntactic judgement will be possible since the construction is semantically anomalous. However, there is a way to make the structure semantically palatable without changing the conditions of the experiment. Consider the fact that indefinite or non-specific NPs do not act as local domain for pronominals (cf. Fiengo and Higginbotham 1983):

(32) a. *John$_i$ saw him$_i$
b. *John$_i$ saw a picture of him$_i$ (non-Specific)
c. John$_i$ saw those pictures of him$_i$ (Specific)
d. John$_i$ saw Bill's pictures of him$_i$ (Specific)

The same applies in Norwegian:

(33) *John$_i$ så et bilde av ham$_i$
'John saw a picture of him'

Hence, we can change (31) by adding a non-specific NP.

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[4]If the direct object in (30) is a pronoun, it moves into INFL as well. I assume that coindexation between the two pronouns then will not violate condition B, since no c-command relation can be defined in such a situation.

This would not alter the conditions of the experiment, and give the sentence the pragmatic usability that facilitates judgement:

(34) S-str: John$_i$ satte Peter$_j$ foran et bilde av ham$_{*i/j}$
'John put Peter before a picture of him'
LF: John$_i$ I-ham$_j$ satte Peter$_j$ [foran et bilde av t]

Since the locative PP is a local domain for condition B, coindexation between Peter and the pronoun would not violate B at S-str. At LF, when the pronoun is in INFL, coindexations with Peter would still not violate binding theory, hence coreference with Peter is possible.

4.5 English anti-subject orientation

So far the movement of English pronouns has been vacuous with respect to binding theory effects, since the movement, as a function of the XP-status of the pronoun, is in general too local to change binding domains between S-str and LF. However, there is one case where the movement in fact does have the effect of moving the pronoun into a new binding domain at LF. Consider the definition of binding domain that I am assuming, repeated here for convenience:

(35) domain D(x) $=_{def}$ The CFC containing x

Notice in particular that the definition of binding domain contains no reference to either subject or governor. This means that a pronoun in ECM subject position should satisfy condition B in that position:

(36) John believes [him to be happy]
----------> S-str cond. B domain

However, this means that the pronoun is free to be coindexed with the matrix subject, which appears to incorrectly predict that (37) should be grammatical:

(37) *John$_i$ believes [him$_i$ to be happy]

But recall that the theory says that the XP-pronoun moves into the Spec of its governor at LF. Since the ECM subject is governed by the higher verb, this means that the LF-representation of (37) is:

(38) John$_i$ [$_{SpecVP}$ him$_i$ [$_{V'}$ believes [t to be happy]]]
----------->LF cond. B domain

In this representation, condition B is violated at LF,

since the pronoun is now contained in the same CFC (=local domain) as the coindexed subject. Hence, in the ECM construction, condition B is satisfied at S-str and violated at LF.

4.6 Romance obviation

The anti-subject orientation effect observed in Norwegian is reminiscent of a property of Romance subjunctive clauses, namely the fact that a pronoun subject of a subjunctive clause must be disjoint from the next higher subject:

(39) *Il$_i$ veut qu'il$_i$ vienne
'he wants that he comes'

However, as has been shown by Picallo (1985) and Kempchinsky (1986), the obviation effect is limited to the next subject up. A direct object, string-intervening between the higher subject and the embedded pronoun, may be coreferential with the pronoun (data from Kempchinsky 1986):

(40) Le permití Elena$_i$ que [pro$_i$ usara mi coche]
(I) permitted Elena that she use(Sbjn) my car

As in Norwegian, this anti-subject orientation effect is only local: If the subjunctive subject pronoun is coindexed with a higher subject, then the structure is grammatical.

The Romance obviation effect therefore looks a whole lot like the Norwegian anti-subject orientation effect. How can the parallelism between Norwegian and Romance be explained? At first glance, Romance pronominals are not like Norwegian, but rather like English. The following paradigm from Spanish shows that the pronouns are not anti-subject oriented in the other contexts in which Norwegian pronouns are:

(41) a. A Juan$_i$ le gusta [su$_i$ libro]
'John likes his book'
b. Juan$_i$ vió detrás de él$_i$
'John looked behind him'
c. Maria$_i$ puso la foto de Elena$_j$ detras de ella$_j$
'Mary put Elena's photograph behind her'

Furthermore, Spanish full pronominals do not allow restrictive modifiers:

(42) a. *ella en la mesa
'she on the table'
b. *ella que esta ahi
'she that stands there'
c. *ella del sombrero rogo
'she with red hat'

Hence, by all tests, Spanish pronominals are XPs. Then, how can they be anti-subject oriented?

The answer is that anti-subject orientation in this theory is not directly linked to being X0, but is rather an indirect consequence of X0s being able to move into a new domain at LF. An XP-pronoun may also be anti-subject oriented, if the conditions are such that it will move into a new domain at LF. Suppose that one of the defining features of the subjunctive constructions is that there is a relation between the matrix tense and the subjunctive tense (cf. Picallo 1985), which has as a consequence that the subjunctive clauses are transparent to government from the higher verb. If this is so, the theory says that the embedded subject pronoun is governed (but not assigned case) by the higher verb, and therefore must move into the higher SpecVP at LF. The overt C does not block movement since this is XP-movement. With this analysis, the LF of the Spanish S-str (43a) is (43b):

(43) a. $[_{S1}$ Maria$_i$ convencio a Elena$_j$ $[_{S2}$ que ella$_j$ usara mi coche]]
b. $[_{S1}$ Maria$_i$ $[_{VP}$ ella$_j$ $[_{V'}$ convencio a Elena$_j$ $[_{S2}$ que $\underline{t}_j$ usara mi coche]]]

At S-str, domain D(ella)=S2. In the LF-representation, however, D(ella)=S1. Hence, ella must be disjoint from the subjacent subject or condition B would be violated at LF. However, it may still be coindexed with the intermediate direct object, exactly as in the Norwegian cases, since that coindexation is legitimate by the binding theory.[5]

5. Evidence for condition application at S-str

So far I have only discussed cases where certain

[5]On the assumption that anaphors move in the same way as pronouns, this analysis incorrectly predicts that reflexives should be grammatical under coindexing with the higher subject of a subjunctive, since the reflexive may move at LF to the higher SpecVP. I do not have a solution to this problem.

coindexations were ruled out as condition B violations at LF, while condition B was satisfied at S-str. Those cases could therefore all be ruled out independently of whether condition B was satisfied at S-str or not. This raises the question of whether condition B needs to apply at S-str. I will here discuss evidence that it does.

Consider again the typical paradigm analyzed in this article:

(44) a. $John_i$ I-$hans_i$ liker [$\underline{t}_i$ bilder]
b. John I likes [his_i pictures]

If condition B applied at LF only, the contrast could be accounted for without condition B application at S-str.

However, the following argument shows that B must apply at S-str in general, even if it does so redundantly in some cases. Consider the following (ungrammatical) S-str and its LF-derivation:

(45) a. *John fortalte Per_j om ham_j
'John told Peter about him'
b. John I-ham_j fortalte Per_j om $\underline{t}_j$

If condition B only applied at LF, nothing would rule out the ungrammatical (45), since the coindexation between Per and ham at LF is legitimate, following the discussion above. However, since condition B applies at S-str as well, (45) is ruled out because it violates B at S-str: Domain D(ham) in (45a) is the containing clause, since the PP does not constitute a CFC (cf. Hestvik 1990). Hence, even though this case satisfies condition B at LF, it violates condition B at S-str. The conclusion is that condition B applies both at S-str and LF.

6. Summary

Pronouns move at LF in the same manner as anaphors, and they move differently according to whether they are X0-pronouns or XP-pronouns. This accounts for the anti-subject orientation of Norwegian X0 pronouns (and its absence in English) by exactly the same mechanism that derives the subject orientation of X0 anaphors and the non-subject orientation of XP anaphors in Pica (1987). The possessive anaphor in (46a) is subject oriented because is moves to the higher INFL, yielding the LF (46b):

(46) a. $John_i$ fortalte Ola_j om [$sin_{i/*j}$ kone]
'John told Ola about REFL wife'
b. $John_i$ I-$sin_{i/*j}$ fortalte Ola_j om [t kone]

The non-reflexive possessive pronoun has exactly the same derivation, and the result is the opposite: It must be disjoint from the subject in [NP,IP], since condition B applies at LF.

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