# Locative inversion in English*

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## 1. Introduction

This article aims at reformulating in more current terms Hoekstra and Mulder's (1990) analysis of the Locative Inversion (LI) construction, illustrated in (2b) below. The new proposal is crucially based on the assumption that Small Clause (SC) predicates agree with their external argument in φ-features, which may be morphologically reflected, as in the case of adjectival agreement in the Italian copular construction *Maria è malata*$_{3sg.fem}$, or abstract, as in the English copular construction. Given this assumption, Hoekstra and Mulder's analysis can be rephrased in terms of hypothesis (1), which actually constitutes the null hypothesis from the perspective of the Last Resort condition on movement: given that A and B share the same φ-features they can both serve in checking (valuing or deleting) the φ-features of the attracting head H.

(1) If A and B agree in φ-features, both A and B can be the goal of some higher head H with uninterpretable/unvalued φ-features, and, consequently, be a candidate for internal merge with H.

## 2. Hoekstra and Mulder's proposal

Hoekstra and Mulder (H&M) have argued that in the LI construction in (2b) the predicative PP *down the hill* occupies the same position as the subject in (2a). The motivation for the movement into SpecIP is the same in both cases: it is needed to satisfy the Case Filter, i.e., to assign nominative case to the subject.

(2) a. The baby carriage rolled down the hill.
b. Down the hill rolled the baby carriage.

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Since the PP is predicated of the subject *the baby carriage*, H&M claim that the two are generated as part of a SC. This implies that we are actually dealing with an unaccusative construction, so that the structure of the two examples is as in (3a) and (3b), respectively. That the subject is marked with nominative case in (3a) is obvious as it is situated in the position where, under the assumptions of the 80's, this case is assigned. That the subject is assigned nominative case in (3b) is not so obvious, however.

(3) a. $[_{IP}\ DP_i\ I\ [_{VP}\ V\ [_{SC}\ t_i\ Pred\ ]]]$
b. $[_{IP}\ Pred_i\ I\ [_{VP}\ V\ [_{SC}\ DP\ t_i\ ]]]$

H&M propose that the movement of the predicative PP into SpecIP makes it possible to transfer the case to the subject in its base position. Their account rests on the following assumptions:

(4) a. A moved phrase is co-indexed with its trace.
b. Finite I assigns nominative case to its specifier; nominative case assignment involves co-indexing of I and the element receiving case.
c. Predication relations involves co-indexing of the predicate and the DP it is predicated of.
d. Each element has a unique index, so that co-indexing is transitive: if A is co-indexed with B and B with C, then A is also co-indexed with C.

According to (4), co-indexing of the phrases in example (2a) is as given in (5a). Since the DP has the indices *i* and *j*, and the trace has the indices *i* and *k*, we can conclude from the unique index requirement in (4d) that $i = j = k$. For this reason, the structure preceding the arrow in (5a) is equivalent to the one following it. As the reader can verify himself co-indexing of the phrases in (2b) is as given in (5b).

(5) a. $[_{IP}\ DP_{i/j}\ I_j\ [_{VP}\ V\ [_{SC}\ t_{i/k}\ Pred_k\ ]]] \Rightarrow [_{IP}\ DP_i\ I_i\ [_{VP}\ V\ [_{SC}\ t_i\ Pred_i\ ]]]$
b. $[_{IP}\ Pred_{j/k}\ I_j\ [_{VP}\ V\ [_{SC}\ DP_i\ t_{k/i}\ ]]] \Rightarrow [_{IP}\ Pred_i\ I_i\ [_{VP}\ V\ [_{SC}\ DP_i\ t_i\ ]]]$

In (5a) nominative case is assigned directly to the DP in SpecIP, but in (5b) this case is, in a sense, transferred to the DP in its base position via the chain of indices. Since I is co-indexed with the predicative PP in SpecIP under (4b), the PP is co-indexed with its trace under (4a), and the PP trace is co-indexed with the predicative DP under (4c), it follows from the transitivity of co-indexing that I is also co-indexed with the postverbal DP, and, as a result, assigns case to it.

## 3. An alternative proposal

### 3.1 Introduction

H&M's proposal predates Chomsky's Minimalist Program (MP). Among other things, this is clear from the fact that their analysis crucially relies on co-indexing, which violates Chomsky's (1995:Chapter 3) inclusiveness condition. H&M's proposal *is* in accordance with the economy constraint normally referred to as Last Resort, since it claims that the movement of the subject/predicative PP is motivated by the Case Filter. However, now that case assignment is replaced by case checking, it seems implausible that case could be the trigger for the movement of the subject/PP. If the case features were the trigger (in Chomsky's 1995 terminology, if the case features were strong), one would predict that also the direct object moves into its case position, Spec*v*P, which is normally assumed not to be the case; after all, since the verb does not move into I in English (cf. e.g. Pollock 1989, Chomsky 1991 and references cited there), this would wrongly predict that English is OV.[1] In current minimalist terms, the obligatory movement of the subject/PP should therefore follow from an epp-feature on I. Another question that requires attention is what determines the choice between (2a) and (2b). Rochemont and Culicover (1990) extensively argued that the choice between the two is related to the information structure of the clause: example (2b) is possible only if the subject belongs to the focus (new information) of the clause.

Some questions that follow from the discussion above are given in (6). I will try to answer these questions, while exploiting H&M's basic insight as reformulated in hypothesis (1).

(6) a. How is the subject assigned case in the LI construction?
b. What triggers the movement of the predicative PP?
c. How can we account for the focus restriction on LI?

Section 3.2 will start with formulating some preliminary answers to these questions within the current version of MP. It will turn out that the answer to question (6c) requires that recourse be taken to Chomsky's (2001) interpretative component *Int*. Since this component is hardly worked out so far, I will not pursue this line of inquiry, but take recourse in Section 3.3 to a more developed and, to my mind, better alternative, viz. the derivation-and-evaluation (D&E) model. The central claim of the D&E framework is that the computational system $C_{HL}$ from MP is not parametrized by means of strength or epp-features. As a result, it generates a limited set of candidates, which are subsequently

evaluated by means of an optimality theoretic evaluation. For a detailed description of the framework I refer to Broekhuis and Dekkers 2000, Dekkers (1999) and Broekhuis (2000/2003). The constraints that will be used below are partly adopted from Costa (1998). Due to space reasons I can do no more than globally indicate how the alternative proposal works. For a more detailed discussion, I refer to Broekhuis (in prep.) where I show that the proposal can be extended to what Rochemont and Culicover (1990) call Preposing around *be* constructions, i.e., predicate inversion in copular and gerundive clauses.

### 3.2 Locative Inversion in the minimalist inquiry framework (MI)

This section investigates what the answers to the questions in (6) would look like within MI. The first question is how the subject in the LI construction in (2b) can be assigned nominative case. If Agree is part of $C_{HL}$, case assignment per se cannot force movement of either the DP in (2a) or the PP in (2b); checking the case feature on I at a distance is always an option. We therefore don't have to assume that case checking forces movement into SpecIP, which solves the problem concerning object movement discussed above: the difference between subject and object movement is accounted for by assuming that I is adorned with an epp-feature that forces SpecIP to be filled, whereas *v* does not have such an epp-feature. It also voids the problem that H&M's proposal poses for the inclusiveness condition; since there is no "transfer" of nominative case to the subject via a chain, the indices in (5) are not needed.

This brings us to question (6b) concerning the trigger for the movement of the PP. If the case feature on I can be checked by the subject in its base position, H&M cannot be correct in saying that case assignment is the trigger for moving the PP into SpecIP in example (2b). Movement of the PP is of course forced by the epp-feature, but it is unclear which feature makes the PP into a possible goal of the movement. The answer to the question which feature is involved in doing this is implicitly given by the intuition underlying H&M's article; the predicate and the DP it is predicated of are assumed to agree, and in current terms this means that they have the same φ-features. Given that I has uninterpretable/unvalued φ-features, we may assume that the φ-features on the predicate make LI possible. If this is on the right track, this gives rise to hypothesis (1) above, which constitutes the basis of the remainder of this article. Note that capturing H&M's intuition in terms of agreement rather than in terms of case is also preferred for empirical reasons, since in some languages predicates can be assigned a case different from the case assigned to the DP

they are predicated of. This is illustrated in the Hungarian example in (7), in which the predicate and the DP are assigned dative and accusative case, respectively (E. Kiss to appear: p.15).

(7) János-t okas-nak tart-ották.
John-ACC clever-DAT regarded-3PL
'They regarded John clever.'

Question (6c), finally, concerns the focus restriction on LI: why is LI only possible when the subject is part of the focus (new information) of the clause? In MI, this should be attributed to the interpretive complex *Int* postulated in Chomsky's (2001:31). *Int* should require the focus of the clause to be *v*P-internal, so that movement of the subject into SpecIP is blocked. As a result, movement of the PP is used as an alternative to satisfy the epp-feature of I.

### 3.3 Locative Inversion in the derivation-and-evaluation framework

The interpretive complex *Int* seems to consist of a set of semantic filters on the output of the derivation. In this section, I will express these filters in the form of an optimality theoretic evaluation. That case cannot be held responsible for the EPP (the obligatory filling of SpecIP) in English can readily be accounted for by saying that the constraint CASE, which requires that case be checked locally (in a Spec-head configuration), is outranked by STAY in English. The conclusion of the previous section that the φ-features make movement of the predicative PP into SpecIP possible can be formalized by assuming that the constraint AGREEMENT, which requires that the uninterpretable/unvalued φ-features be checked locally, outranks STAY. This would lead to the ranking AGREEMENT >> STAY >> CASE.[2]

This ranking correctly accounts for the EPP, since it requires that SpecIP be filled. To account for the fact that LI depends on the question whether the subject is part of the focus of the clause or not, we can take recourse to ALIGNFOCUS, which requires that the focus be as close to the right edge of the clause as possible. An obvious thing to do is to assume that ALIGNFOCUS outranks AGREEMENT, as in ALIGNFOCUS >> AGREEMENT >> STAY >> CASE. This predicts that movement of the subject into SpecIP is blocked when it is part of the focus of the clause. Although this is precisely what we need in the case of the LI construction, this ranking cannot be the correct one, since it wrongly predicts that in intransitive or unaccusative examples like *John laughed/died* the subject need not be moved into SpecIP either. However, given that AGREEMENT can also be satisfied by moving the predicative PP into SpecIP, it is not needed to

assume that ALIGNFOCUS outranks AGREEMENT. I will show that ranking (8) will give us the desired results. The curly brackets indicate that the ranking of ALIGNFOCUS and STAY cannot be determined at this stage, because they conspire in blocking movement.

(8) English Ranking: AGREEMENT >> {ALIGNFOCUS, STAY} >> CASE

Consider again the examples in (2). Let us first investigate what (8) predicts when the subject is part of the presupposition of the clause, that is, for examples like (2a). Consider the three candidates in tableau (9). Given that the subject is not part of the focus of the clause, the constraint ALIGNFOCUS is not relevant. AGREEMENT blocks the third candidate, in which the EPP is violated. The first and second candidate score equally well with respect to STAY, so that CASE has the last say. Since movement of the PP violates both STAY and CASE, whereas movement of the subject violates STAY only, the latter is preferred. We therefore correctly predict that the first candidate in tableau (9) is the optimal one.

(9) DP is part of the presupposition of the clause

| example (2a) | AGREEMENT | ALIGNFOCUS | STAY | CASE |
|---|---|---|---|---|
| DP I … V t PRED ☞ | | | * | |
| PRED I … V DP *t* | | | * | *! |
| e I … V DP PRED | *! | | | * |

If the subject is part of the focus of the clause, as in (2b), the evaluation proceeds as indicated in tableau (10), where the focused phrase is given in boldface. Moving the subject into SpecIP results in a structure violating ALIGNFOCUS, which is therefore blocked. Leaving SpecIP empty also leads to a structure that violates ALIGNFOCUS. Movement of the PP into SpecIP is therefore the only possibility left.[3]

(10) DP is part of the focus of the clause

| example (2b) | AGREEMENT | ALIGNFOCUS | STAY | CASE |
|---|---|---|---|---|
| **DP** I … V t PRED | | *!* | * | |
| PRED I … V **DP** *t* ☞ | | | * | * |
| e I … V **DP** PRED | *! | * | | * |

We also derive the correct results for intransitive/unaccusative constructions like *John laughed/died*. Since AGREEMENT outranks ALIGNFOCUS, movement of the DP is forced irrespective the question whether it is part of the presupposition or the focus of the clause. Table (11) illustrates this for the unaccusative construction *John died*.

(11) DP is part of the focus of the clause

| John died | AGREEMENT | ALIGNFOCUS | STAY | CASE |
|---|---|---|---|---|
| **DP** I V *t* ☞ | | * | * | |
| e I V **DP** | *! | | | * |

Observe that placement of ALIGNFOCUS below CASE would wrongly predict the first candidate in tableau (10) to be the optimal one (for the other cases the result would not change); the LI construction is therefore decisive for determining the relative ranking of ALIGNFOCUS and CASE in (8).

## 4. Some consequences

### 4.1 Object shift in English

Section 3 has given a reformulation of H&M's proposal concerning LI in more current terms. Section 3.2 considered the question what their proposal might look like when phrased in the terminology of MI, and Section 3.3 made a more explicit proposal within the D&E framework. The new proposal crucially rests on the assumption of the ranking in (8). As it is stated, (8) does not only predict that the subject must be moved into SpecIP, but also that the object must move overtly in order to check the verb's agreement features (object agreement). Movement is, however, not required for checking the case features of the verb. Below I will argue that this sheds new light on a long standing problem in the description of English, namely, that some researchers (such as Johnson 1991, Koizumi 1993, Hornstein 1995, and Lasnik 1999) have entertained the idea that English has obligatory object movement, whereas others (most notably Chomsky) maintain that object movement is normally excluded. I will show that these two positions can be reconciled when we adopt (8).

Broekhuis (2000) has argued that object shift may target at least two different positions in the clause: the object may precede either V or *v*. These movements are triggered by respectively the φ-features on V and the accusative case features on *v*. If we ignore the subject for convenience, the derivation of the clause may be as in (12). First, the φ-features on V may trigger movement of the object into the checking domain of V; cf. (12a). After that *v* is merged and its case features may attract the object to its checking domain; cf. (12b).[4] After (12b) the derivation will proceed with the merging of I.

(12) a. $[_{VP}\ V_{\varphi}\ O_{case/\varphi}] \Rightarrow [_{VP}\ O_{case/\varphi}\ V_{\varphi}\ [_{VP}\ t_V\ t_o]]$
b. $[_{vP}\ v\ [_{VP}\ O_{case/\varphi}\ V_{\varphi}\ [t_V\ t_o]]] \Rightarrow [_{vP}\ O_{case/\varphi}\ v\ [_{vP}\ t_v\ [_{VP}\ t_O\ V_{\varphi}\ [_{VP}\ t_V\ t_o]]]]$

The question whether movement (12a) or (12b) indeed occur depends on the constraint ranking in the given language. For example, Broekhuis (2000) argues that Dutch has the ranking AGREEMENT >> ALIGNFOCUS >> CASE >> STAY, so that movement (12a) is obligatory. Given that V-to-*v* need not apply in Dutch, this gives rise to the Dutch OV-order (see Broekhuis 2000 for a more careful discussion). The application of movement (12b) depends on the question whether the object is part of the focus or the presupposition of the clause. In the former case the movement does not applies, whereas in the latter case it does. In this way, the phenomenon of Scrambling is partly accounted for.

The English ranking in (8) predicts that movement (12a) is obligatory, whereas movement (12b) is excluded. Movement (12a) inverts the order of the object and V, but this is made invisible by the subsequent obligatory V-to-*v* movement: [$_{vP}$ v+V [$_{VP}$ O $t_V$ [$_{VP}$ $t_V$ $t_O$]]]. Since movement (12b) does not apply in English, the surface order of transitive constructions is VO.

Evidence for the obligatory movement of the object into the checking domain of V does not seem to be too hard to come by. Adverb placement, for example, may constitute one piece of evidence. Consider again the resulting structure of this movement: [$_{VP}$ O V [$_{VP}$ $t_V$ $t_O$]]. If we assume that adverbial phrases that modify the VP occupy a position immediately left-adjacent to the lower VP, ranking (8) predicts that the direct object will cross these adverbs; cf. (13a). From the fact that V obligatorily moves to *v* in the next stage of the derivation and stays put there, it finally follows that in the normal case the object is right-adjacent to the main verb and precedes the VP-adverbs; cf. (13b).

(13) a. [$_{VP}$ DP V [AdvP [$_{VP}$ $t_V$ $t_{DP}$]]]
b. [$_{vP}$ *v*+V [$_{VP}$ O $t_V$ [AdvP [$_{VP}$ $t_V$ $t_O$]]]]

This prediction for direct objects differs sharply from that for PP-complements. Since PP-complements do not have φ-features they can simply remain in situ, as in (14a). The next step in the derivation is the merger of *v* and V-to-*v* movement. This gives us structure (14b), where the verb and the PP-complement are not adjacent.

(14) a. [AdvP [$_{VP}$ V PP]]]
b. [$_{vP}$ *v*+V [AdvP [$_{VP}$ $t_V$ PP]]]

This accounts for the well-known contrast between complement DPs and other types of complements: because only the former have φ-features, only they must move across the adverbs into a position right-adjacent to the verb. This is illustrated by the examples in (15), taken from Chomsky (1995:329ff.).

(15) a. John reads every day to his children.
b. *John reads every day books.

Another piece of evidence may be provided by passive existential constructions like (16a), in which the internal argument precedes the passive participle. This order may result from φ-feature checking, as in (16a′). The fact that the subject follows the finite verb in existential constructions like (16b) follows from the fact that in those cases V is moved one step further, namely to the position of *v*.[5]

(16) a. There was a man killed.
a′. There was [$_{VP}$ a man killed [$_{VP}$ $t_{killed}$ $t_{a\ man}$]]
b. There entered a man (into the room)
b′. There [$_{vP}$ *v*+entered [$_{VP}$ a man $t_{entered}$ [$_{VP}$ $t_{entered}$ $t_{a\ man}$ (into the room)]]]

Note that the two phenomena discussed above constitute notorious problems for the proposals in the current version of MP. Chomsky (1995:329ff.) provided an account for the data in (15) that was based on the MLC, but it is far from clear whether that proposal can still be maintained now we have introduced the operation Agree (and, actually, Chomsky's crucial claim that adverbial phrases block covert movement of the object into its case position was problematic right from the start). The fact that example (16a) is problematic for MP is clear from the fact that Chomsky (2001) proposes an account in terms of PF-movement. I think that the proposal given here is preferable since it provides an account of these data in purely syntactic terms.

It is easy to extend the body of evidence in favor of the obligatory object movement discussed above, but for reasons of space I can do no more than referring to Hornstein's discussion of Antecedent Contained Deletion (1995: ch.5) and the studies collected in Lasnik (1999).

### **4.2** Predicate movement in Dutch

Hypothesis (1) has a wide range of consequences for the grammars of languages other than English as well. This section briefly sketches one of the consequences for the grammar of Dutch (cf. Broekhuis, in prep., for a more detailed discussion). Since the introduction of the LCA in Kayne (1994), it is commonly assumed that all languages are VO underlyingly. Section 4.1 has briefly indicated how the Dutch OV order can be derived from this underlying VO source. The derivation of the OV order is, however, only one problem out

of a set of many. For example, it is normally assumed that also SC predicates are base-generated to the right of the verb, whereas in Dutch they must precede the verbs in clause-final position (*dat Marie ziek is/*is ziek* 'that Marie is ill'). From this, Zwart (1993) and Koster (1994) rightly concluded that, just like the objects, SCs must be moved leftwards. In order to obtain a landing site for the SC, they proposed that predicate movement targets the specifier position of PredP.

Hypothesis (1), however, radically changes our view on this proposal. Given the assumption that the SC predicate agrees with the argument it is predicated of, the following statements follow as corollaries from (1).

(17) A SC predicate may move into any position normally targeted by:
  a. the nominative DP in an unaccusative construction;
  b. the accusative DP in a transitive construction.

Locative Inversion is of course an example of (17a). What I want to suggest here is that the movement of the SC into preverbal position in Dutch is an instantiation of (17b): the SC is moved into the position in which the φ-features of V are checked (while Pied Piping the SC subject). Although the space is lacking to fully explore this option in this paper, the proposal is supported by the fact that cross-linguistically SC predicates tend to precede the verb in OV-languages, whereas they follow the verb in VO languages. From Zwart and Koster's perspective this is accidental, since the trigger for predicate movement is not the same as the trigger for object movement. In the present proposal, on the other hand, this cross-linguistic generalization is precisely what we expect.

## 5. Conclusion

This article has proposed a revision of Hoekstra and Mulder's (1990) account of English Locative Inversion, and briefly investigates some consequences of the revised proposal for the grammar of English and Dutch. The main conclusion is that movement of SC predicates can be triggered by the uninterpretable/unvalued φ-features on I and the verb, thus showing that these features do not only play a role in triggering object movement, but also in triggering movements of other types. Thus, hypothesis (1) contributes to the main goal of the minimalist program of reducing the grammatical system by maximally exploiting features that are needed for independent reasons.

## Notes

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**1.** Many researchers have argued for various reasons that movement of the object is possible in English. Section 4 will follow this conclusion, but argue that the trigger of this movement are not the case, but the φ-features on the verb (object agreement). Since the object agreement features are checked in a lower position than accusative case, object movement does not effect the order of the verb and the object, thus giving rise to the illusion that object movement does not apply in English.

**2.** The proposal here implies that checking can be done either locally, i.e., in a spec-head configuration, or at a distance.

**3.** The constraint ALIGNFOCUS is gradient, which means that each constituent that follows the focus of the clause adds a violation of this constraint. As a result the first candidate violates this contraint twice (the DP in focus is followed by the verb and the predicative PP), whereas the third candidate violates it only once (the DP is followed only by the PP).

**4.** I follow here Nash and Rouveret's (1997) theory of proxi-heads in (12), but nothing crucially hinges on that; one may equally well assume that the object is moved into an inner or outer spec-position of V/*v*.

**5.** This raises the question why the internal argument follows the past participle in (ia); after all it is predicted that object movement is triggered by the φ-features. This might be due to an additional movement of the participle into an aspectual head Asp or, perhaps, *v*. That the object has moved in (ia) is clear from the fact that it precedes the VP-adverb *softly*. The suggested analysis implies that passive and past participles differ in that only the latter is associated with ASP/*v*.

(i) a. John has kissed Mary softly.
b. John has [$_{\text{AspP}}$ Asp+kissed [$_{\text{VP}}$ Mary $t_{\text{kissed}}$ [softly [$_{\text{VP}}$ $t_{\text{kissed}}$ $t_{\text{Mary}}$]]]]

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