

Light and Heavy Locative Inversions: A Lexical and Constructional Perspective

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1. Introduction

Culicover and Levine's (2001) analysis of the English locative inversion differs from others in a sense that it distinguishes two subtypes of locative inversions, light vs. heavy inversions, depending on the heaviness of the postverbal NP. According to the analysis, the light inversion in general has a light NP consisting of a determiner and a noun or a proper noun with no focal stress, while the heavy inversion has a heavy NP consisting of a complex NP with modifiers or a proper noun with focal stress. This difference is manifested by examples like (1):

- (1) a. Into the room walked Mary / a woman. (light inversion: LI hereafter)
b. Into the room walked MARY / the students in the class who had heard about the social psych experiment that we were about to perpetrate. (heavy inversion: HI hereafter)

Though the relative notion of heaviness is difficult to formalize, we could observe that this heaviness constrains English syntax in the so called heavy NP shift construction in (2):

- (2) a. *Kim put ___ [on the table] [the book].
b. Kim put ___ [on the table] [the book he brought in Vienna].
c. Kim put ___ [on the table] ... [THAT BOOK] (not this book).

In (2)a, the NP is not heavy and cannot be shifted to the right peripheral position, while the heavy NPs in (2)b,c can be dislocated to the sentence final position.

The same observation is made in the locative inversion as shown in the contrast between (3) and (4) (Culicover and Levine 2001):¹

¹ The capital here designates a phrase with prominent focal stress.

- (3) a. *Into the room walked carefully Robin.
 b. *Into the room walked carefully a woman.
- (4) a. Remember Robin? Well, into the room walked __ carefully, ... [ROBIN].
 b. Into the room walked __ carefully [the students in the class who had heard about the social psych experiment that we were about to perpetrate].

The nonheavy NPs in (3) cannot appear in the right peripheral position while the heavy NPs in (4) occur in this position.

In spite of such distributional differences between the LI and the HI, there exist more differences as well as similarities between the two types of locative inversion. This paper investigates their properties in more detail and explores a constraint-based approach in particular, in terms of lexical and constructional perspectives. The theoretical framework we adopt is Head-Driven Phrase Structure Grammar (HPSG) which allows tight interactions among various grammatical components such as lexicon, syntax, semantics, information structure, and constructions.

2. Similarities between Light and Heavy Locative Inversions

Both the light inversion (LI) and heavy inversion (HI) place restrictions on the types of the main predicate (Birner 1994, Birner and Ward 1998, Coopmans 1989, Bresnan 1994, and others). First of all, both types of inversion do not allow the main predicate to be a transitive verb:

- (5) a. *Into the room rolled John the ball. (LI)
 b. *Into the room rolled the ball John. (LI)
- (6) a. *Into the room rolled the man with long blond hair the ball.
 (HI)
 b. *Into the room rolled the ball the man with long blond hair.
 (HI)

This does not mean that all intransitive verbs are possible. Though both inversion types permit intransitive verbs such as *sit*, *fall*, *jump*, *run*, and the like as in (7), they do not allow intransitive verbs such as *knit*, *spit*, *drink*, *excrete* as in (8):

- (7) a. In the room was sitting Robin. (LI)
 b. Onto the track ran the horse. (LI)
 c. In the room was sitting a man with long blond hair. (HI)
- (8) a. *In the room was knitting Robin. (LI)
 b. *In the room was knitting a woman with long blonde hair. (HI)
 c. *On the corner was drinking a woman with long blonde hair. (HI)

As noted by Bresnan (1994), the contrast between (7) and (8) appears to be related to the argumenthood of the locative PPs. In (7), the PPs are complements while in (8) the PPs are purely adjuncts.²

Another similarity comes from the so-called freezing effects (Rochemont 1986, Levine 1989, and others). In both, neither part of the preverbal PP nor the postverbal NP can undergo an extraction process as shown in the following:

- (9) a. *What does in the garden stand __ ? (LI)
 b. *Which room did he say into __ walked John? (LI).
- (10) a. *Which one of the students majoring in linguistics does in the garden stand __ ? (HI)
 b. *Which room did he say into __ walked one of the students majoring in linguistics? (HI)

In a similar spirit, we could observe that both types do not allow the SAI (subject-aux inversion) whose phenomenon has often been cited as evidence for treating inversion as a root phenomenon:

- (11) a. *Did into the room walk a woman? (LI)
 b. *Did into the room walk one of the students majoring in linguistics? (HI)

Focus and topic also induce similarities. According to Green (1985), Rochemont (1986), and Bresnan (1994), the postverbal NPs carry pre-entational focus:

² The following contrast exhibits one main difference between a complement and an adjunct (Bresnan 1994):

- (i) a. On the corner, who drank?
 b. *On the corner, who stood?

- (12) A: I am looking for my friend Rose.
 B: # Among the guests of honor was sitting Rose.
- (13) A: I am looking for my friend Rose.
 B: # Among the guests of honor was sitting Rose wearing big sun
 - glasses. (HI)

The B sentences in (12) and (13) are awkward because the postverbal NPs were already introduced into the dialogue and cannot carry the presentational focus.

A similarity also arises from the topic property of the preverbal PP. In (14)b, c the preverbal PP is replaced with an indefinite pro-PP. This causes its illformedness: the preverbal PP is supposed to have a topichood which is generally compatible with a definite expression (cf. Schachter 1992).

- (14) a. A child was found somewhere.
 b. *Somewhere was found a child. (LI)
 c. *Somewhere was found a child who seemed to be kidnapped a few months ago. (HI)

Given Bresnan's (1994) observation that topic cannot be a contrastive focus, we could see that the PP in both types functions as topic. As noted in the following, the preverbal PP, unlike the postverbal PP, cannot be contrastive-focused:

- (15) a. On the wall hung canvases, but not paintings. (LI)
 b. # On the wall hung canvases, but not on the easels. (LI)
- (16) a. On the shelf sat a pink rabbit with a blue ribbon, but not the black one with a red ribbon. (HI)
 b. # On the shelf sat a pink rabbit with a blue ribbon, but not on the table. (HI)

These two types of inversion also exhibit root phenomena. Even though English does not allow inversions in embedded clauses as in (16), the situation is different when the complementizer *that overtly* exists:³

³ It is noteworthy that exactly the same distributional parallelism can be observed in canonical topicalization constructions:

- (17) a. *Bill asked if near John's house lies buried treasure. (LI)
 b. *Bill asked if near John's house lies buried treasure that was hidden by the pirates. (HI)
- (18) a. Mary said [that under the tree sat a woman]. (LI)
 b. *Mary said [under the tree sat a woman]. (LI)
 c. Mary said [that under the tree sat a woman with long blonde hair]. (HI)
 d. *Mary said [under the tree sat a woman with long blonde hair]. (HI)

A final similarity to note concerns agreement. Both types of inversions have the same number agreement pattern:

- (19) a. Under the tree sits / *sit a woman. (LI)
 b. Under the tree *sits / sit two women. (LI)
 c. Under the tree sits / *sit a woman with long blonde hair. (HI)
 d. Under the tree *sits / sit two women with long blonde hair. (HI)

As noted here, the verb in both types agrees with the postverbal NP.

3. Differences between Light and Heavy Inversions

In spite of such similarities between the two types of inversion, there exist interesting differences between the two. The discussion of this section is mainly based on the arguments set forth by Culicover and Levine (2001).

One of the differences between the LI and HI is that only LI exhibits the amelioration effect of the weak cross-over (WCO). Observe the following contrast:

- (20) a. *Into every dog_i's cage, its_i owner peered. (Topicalization)
 b. Into every dog_i's cage peered its_i owner. (LI)

When the PP is simply topicalized into the beginning of a sentence as in (20)a, it induces the WCO effect. However, the PP in the LI as in

-
- (i) a. *Bill asked if the dog, the man kicked.
 b. Mary said [that the dog, the man kicked].
 c. *Mary said [the dog, the man kicked].

(20)b, the WCO effect is ameliorated. This suggests that the preverbal PP position in (20)b may have a different status from that of (20)a:⁴ However, this kind of amelioration effect does not occur in HI, as observed in the following:

- (21) a. In every dog_i's cage hung itsi collar. (LI)
 b. *Into every dog_i's cage hung on a hook itsi most attractive and expensive collar. (HI)

This contrast also suggests that the preverbal PP in HI, unlike the PP in LI, is in the same position as the topicalized phrase (e.g., A'-position).

The HI also differs from the LI in the terms of extraction. For example, only the PP in LI can participate in an extraction construction as shown by the contrast in (22):

- (22) a. *Into the room I claim / believe walked Robin. (LI)
 b. Into the room I claim / believe walked a ravenous horde of angry Tolstoy scholars. (HI)

The same contrast is observed even in an infinitival or gerundive clause as shown in (23) and (24):

- (23) a. *Into the room I expected __ to walk Robin. (LI)
 b. From this pulpit I expected __ to preach a close associate of the great Cotton Mather. (HI)
- (24) a. *I decided to let no one into the room; in fact, into the room I prevented __ from walking Robin. (LI)
 b. I decided to allow no one to do anything in this church; in fact, from this pulpit I even prevented __ from preaching a close associate of the great Cotton Mather. (HI)

The examples in (22)-(24) suggest that the preverbal PP in the HI can be licensed by an unbounded dependency mechanism while the PP in the LI should remain in its local position, not being able to appear in a nonlocal position.

Another striking difference concerns the status of the postverbal NP. Observe the following contrast:

⁴ One feasible distinction would be A-position and A'-position.

- (25) a. *Into the cafeteria have both gone the students, I think. (LI)
 b. From this pulpit have both preached Cotton Mather's two closest and most trusted associates. (HI)

As noted here, the quantifier *both* can appear only when its antecedent is a heavy NP.

In a similar spirit, only the heavy NP in HI can serve as the unexpressed subject of the infinitival clause as noted from the contrast in (26):

- (26) a. *Into the room __ expected PRO to walk Robin. (LI)
 b. From this pulpit __ expected PRO to preach a number of close associates of the great Cotton Mather himself. (HI)

What these floating quantifier and control phenomena imply is that the postverbal NP functions as the subject since the license of the floated quantifiers and PRO control are canonical properties of the grammatical subject.

Raising displays another difference: it appears that only the PP in the HI serves as the subject of a raising verb:

- (27) a. *Into the room appeared to be walking Robin slowly. (LI)
 b. Into the room appeared to be walking slowly a very large caterpillar. (HI)

Even though Culicover and Levine (2001) suggest the needs to distinguish the two types of inversion, their analysis fails to provide a systematic analysis that can capture the similarities as well as differences of the two types of inversion. In the following section, we will propose a different perspective, based on the constructional and lexical constraints in HPSG.

4. Interactions between Constructions and Lexicon

4.1 Lexical Constraints

As noted earlier, both types of inversion place strict restrictions on the possible types of verbs: they allow only a limited set of intransitive verbs that select a theme NP and a locative phrase as their arguments.

Before we discuss the lexical properties of such verbs, let us briefly

introduce the framework of the lexicon in HPSG. HPSG specifies an inventory of lexical types and the various constraints that instances of those types must obey. For example, the type *int-v-lym* (*intransitive-verb-lexeme*) will minimally have the following lexical information:

$$(28) \left[\begin{array}{l} \textit{int-v-lym} \\ \text{HEAE} \quad [\textit{verb}] \\ \text{ARG-ST} \quad \langle [\] , \dots \rangle \end{array} \right]$$

One basic constraint such a lexeme observes when it is realized as a word is the Argument Realization Constraint given in (29):

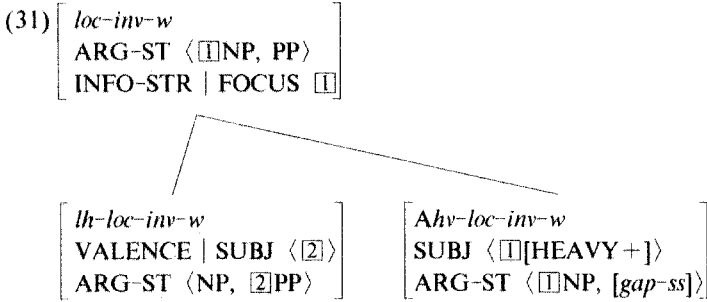
(29) Argument Realization Constraint (ARP):

$$\left[\begin{array}{l} \textit{word} \\ \text{VALENCE} \quad \left[\begin{array}{l} \text{SUBJ} \quad \boxed{A} \\ \text{COMPS} \quad \boxed{B} \end{array} \right] \\ \text{ARG-ST} \quad \boxed{A} \oplus \boxed{B} \end{array} \right]$$

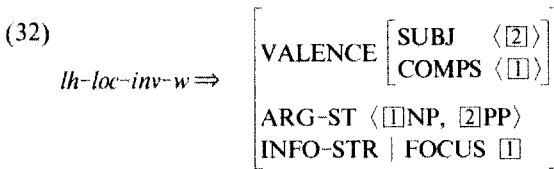
This ARP basically ensures that all arguments are realized on the appropriate valence list: SUBJ and COMPS. For example, an intransitive verb like *sit* will be realized as follows:

$$(30) \left[\begin{array}{l} \textit{int-v-w} \\ \text{PHON} \quad \langle \textit{sit} \rangle \\ \text{VALENCE} \quad \left[\begin{array}{l} \text{SUBJ} \quad \langle [1] \rangle \\ \text{COMPS} \quad \langle [2] \rangle \end{array} \right] \\ \text{ARG-ST} \quad \langle [1] \text{NP}, [2] \text{PP} \rangle \end{array} \right]$$

We assume that verbs in locative inversion, belonging to the type *loc-inv-v*, are noncanonical realizations of the verbs in *int-v-lym*. This type of verbs can be realized either into *lh-loc-inv-w* or *hv-loc-inv-w* as represented in the following hierarchy:



As observed, the type *loc-*inv-w** has the constraints (i) that a verb of locative inversion has two arguments, an NP and a PP, and (ii) that the NP is focused (cf. Vallduvi and Engdahl 1996, Engdahl and Vallduvi 1996). These constraints will be inherited to its subtypes *lh-*loc-*inv-w*** and *hv-*loc-*inv-w***. A particular property that the type *lh-*loc-*inv-w*** has is a dissociation between valence and argument structures, i. e., the PP is realized as the grammatical subject and hence the NP as the grammatical complement (in accordance with the ARP in (29)). The inheritance system then assigns the following information to the type *lh-*loc-*inv-w*** at least:



In the case of *hv-*loc-*inv-w***, no such dissociations happen. It simply specifies that its subject NP bears the feature [HEAVY +] and the PP is realized as a gap. This again means that *hv-*loc-*inv-w*** would in the end have at least the following constraints:⁵

⁵ The LOCAL value of the *gap-ss* corresponds to its SLASH value:

(i) *gap-ss* ⇒ $\left[\begin{array}{l} \text{LOC} \boxed{1} \\ \text{SLASH} \boxed{1} \end{array} \right]$

$$(33) \quad lh-loc-INV-w \Rightarrow \left[\begin{array}{l} \text{VALENCE} \left[\begin{array}{l} \text{SUBJ} \langle \square \square [\text{HEAVY} +] \rangle \\ \text{COMPS} \langle \rangle \end{array} \right] \\ \text{ARG-ST} \langle \square \text{NP}, [\text{gap-ss}]_j \rangle \\ \text{SLASH} \{ \text{PP}_j \} \\ \text{INFO-STR} \mid \text{FOCUS} \square \end{array} \right]$$

The SLASH value PP_j is guaranteed by the SLASH Amalgamation Principle: if an element of the ARG-ST is slashed, the head which selects it is also slashed. The feature $[\text{HEAVY} +]$ represents the heaviness information given to an element either by focal stress or by constituent length as we have seen in examples like (2).⁶ The independently motivated feature $[\text{HEAVY} +]$ in English places a linear precedence restriction on constituents: the $[\text{HEAVY} +]$ NP be at the end of the sentence. This could explain the contrast shown in (3) and (4), repeated here again:⁷

- (34) a. Into the room walked Robin / a woman carefully.
 b. *Into the room walked carefully Robin / a woman.
- (35) a. Remember Robin? Well, into the room walked __ carefully, ... [ROBIN].
 b. Into the room walked __ carefully [the students in the class who had heard about the social psych experiment that we were about to perpetrate].

The postverbal NP in the LI in (34) is a non-heavy complement and should behave like an ordinary NP object and thus come right after the verb. This explains the ungrammaticality of (34)b. In contrast, the postverbal NP in the HI in (35) carries the $[\text{HEAVY} +]$ feature and should appear in the sentence final position. This allows both the examples in (35).

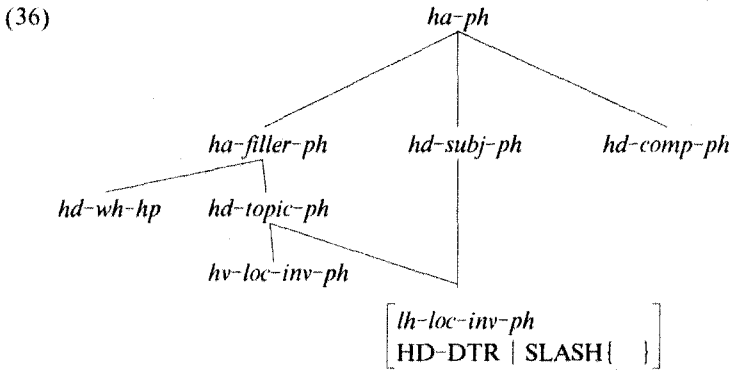
⁶ We may consider that the $[\text{HEAVY} +]$ feature is instantiated or imposed by constructional constraints.

⁷ Postal (1970) and Dowty (1990) observe that no adverbs or parentheticals can intervene between a verb and its direct object, as shown in the following:

- (i) a. I could have been easily passing the note to her.
 b. *I could have been passing easily the note to her. (Dowty 1990)
- (ii) a. I believe very strongly that Tony is honest.
 b. *I believe very strongly Tony to be honest. (Postal 1970)

4.2 Constructional Properties

Unlike Chomskyan derivational approaches that discourage recognizing constructions as of any theoretical interest, HPSG employs constructions as core parts of the grammar together with the assumption that syntactic structures are form-meaning pairings with inherent constraints. In HPSG, these inherent constructional constraints are incorporated in the grammar by the mechanism of multiple type inheritance hierarchy (cf. Sag 1997). Adopting this idea, we assume the grammar includes the following type hierarchy, partly following Chung (2001) and Chung and Kim (2002):



This hierarchy tells us that the *hd-ph*(*headed-ph*) has at least three subtypes such as *hd-filler-ph*, *hd-subj-ph* and *hd-comp-ph*. The *hd-filler-ph* in turn has at least two subtypes such as *hd-wh-ph* and *hd-topic-ph*. According to Bouma et al. (2001) and Ginzburg and Sag (2000), among others, the phrase types relevant to the current discussion have the following constructional constraints:

- (37) *hd-subj-ph*:
 $[SUBJ \langle \rangle] \rightarrow \square, H \left[\begin{array}{l} phrase \\ SUBJ \langle \square \rangle \end{array} \right]$
- (38) *hd-filler-ph*:
 $[] \rightarrow [LOC \square], H \left[\begin{array}{l} HEAD verb \\ SLASH\{ \square \} \end{array} \right]$
- (39) *hd-subj-ph*:
 $[] \rightarrow \square[TOPIC \square], H \left[\begin{array}{l} VFORM fin \\ IC + \end{array} \right]$

The constraint in (37) states that the *hd-subj-ph* consists of a subject daughter and a head phrase whose SUBJ value is token identical to the subject daughter. (38) says that the *hd-filler-ph* consists of a filler and a head daughter whose SLASH value is the same as the LOCAL value of the filler daughter. (39) specifies that the consists of the filler whose information-structure has the value of TOPIC (cf. Vallduvi and Engdahl (1996)) and the head whose verb form is finite. Note here that the head phrase always has [IC +] (independent clause). This implies that the *hd-topic-ph* displays the so-called root phenomenon, and makes sure that the phrase occurs only in a matrix clause or in an embedded clause whose complementizer form is the overt that (Ginzburg and Sag 2000).

According to the type inheritance hierarchy in (36), *lh-loc-inv-ph* is a subtype of *hd-subj-ph* and *hd-topic-ph* which in turn serves as a subtype of *hd-filler-ph*. This means that all the constructional constraints stated in the supertypes in (37)-(39) need to be inherited to the subtype, *lh-loc-inv-ph*. In addition to this type inheritance, the *lh-loc-inv-ph* has its own constraint on the SLASH value: the head-daughter's SLASH value is an empty set, as shown in (36). This raises a conflict against one of the supertypes *head-filler-ph* since the supertype's SLASH value is non-empty as shown in (38). In this case, the empty set value overrides the non-empty set value because the former is specified in the subtype. The assumption of the empty set of the SLASH value in the *lh-loc-inv-ph* is required to account for one of the differences between the light and heavy inversions.

All the constraints stated in (36)-(39) are inherited to the *lh-loc-inv-ph*, resulting in their collection shown in (40):

$$(40) \quad [] \rightarrow [] \left[\begin{array}{l} \text{LOC } [2] \\ \text{TOPIC } [1] \end{array} \right] \text{H} \left[\begin{array}{l} \text{VFORM } \textit{fin} \\ \text{IC } + \\ \text{SUBJ } \langle [] \rangle \\ \text{SLASH } [] \end{array} \right]$$

The constraints in (40) state the following: (i) the PP functions as the subject at the valence level while it functions as a topic at the information structure level, (ii) the head verb needs to be a finite form, (iii) the locative inversion phrase occurs in an independent clause and has the so-called matrix-clause effect (or root phenomenon), and (iv) the SLASH value of the head daughter is empty, which means that long

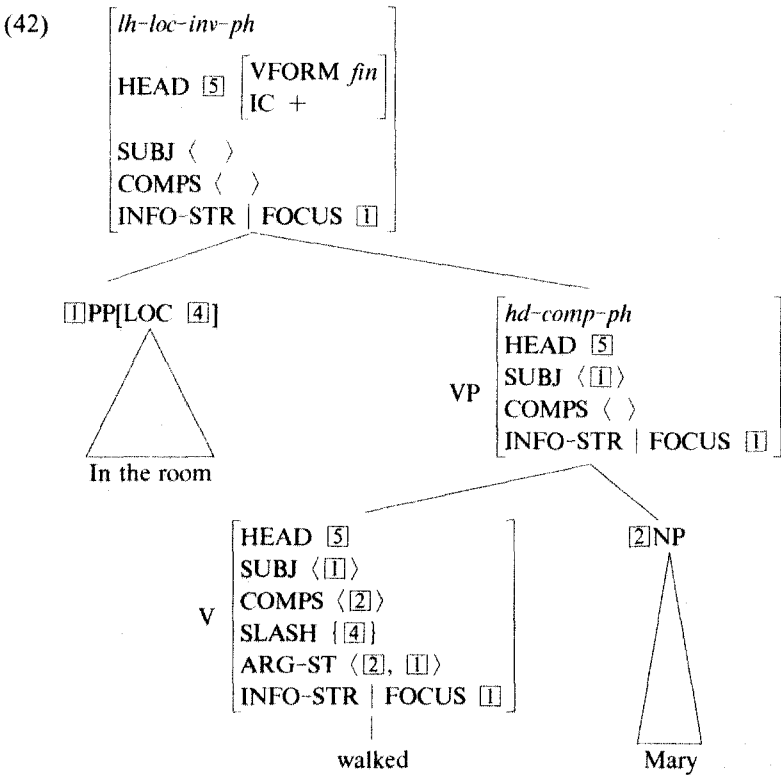
extraction is not allowed in this construction.

Meanwhile, the *lv-loc-inv-ph* is simply a subtype of the *hd-topic-ph* as shown in (36). This means the type will inherit the constraints not from the type *hd-subj-ph* but from its supertype *hd-topic-ph* and *hd-filler-ph*, resulting in the collection of the constraints as in (40):

$$(41) \quad [] \rightarrow [1] \left[\begin{array}{l} \text{LOC } [2] \\ \text{TOPIC } [1] \end{array} \right] \text{H} \left[\begin{array}{l} \text{VFORM } \textit{fin} \\ \text{IC } + \\ \text{SLASH } [2] \end{array} \right]$$

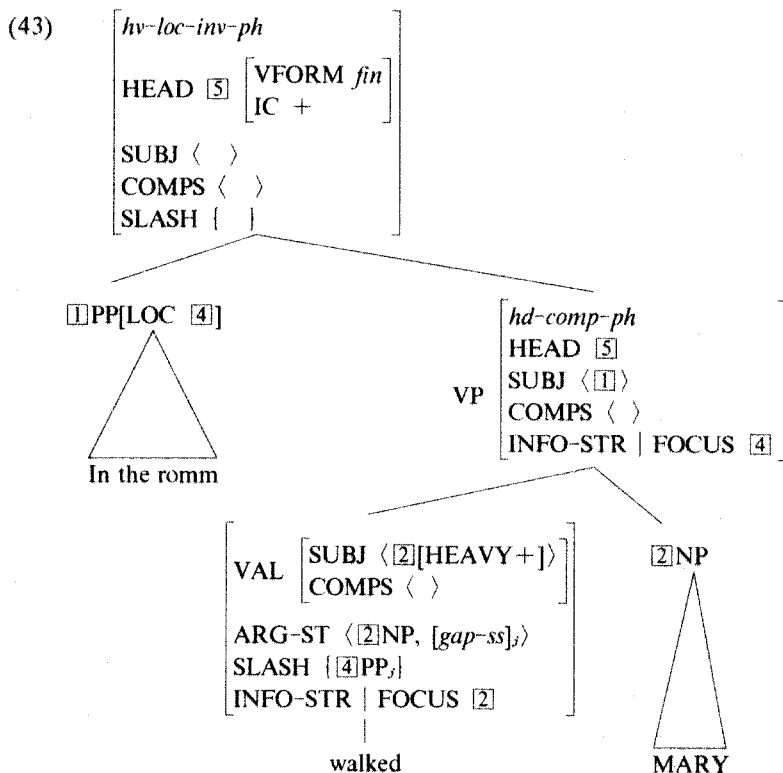
In due course, we will see such a hierarchical difference induces major differences between the two types of inversion.

Let us now then see a sample structure of LI and HI inversions in the present analysis. Consider a light inversion case, first:



In the tree structure, the head of the *lh-loc-INV-ph* is finite and independent clause ([IC +]). The first element in the argument-structure is realized as the subject and the second one as the complement. This structure observes all the relevant constraints.

Meanwhile, the heavy inversion construction would have the following structure.



As noted, unlike the light inversion verb, the heavy inversion verb *walked* requires its subject to be heavy and the second argument to be a gap element. The gapped PP is constructionally discharged in accordance with the constraints on *loc-INV-ph*. Once again, no constraints in the grammar are violated in this structure.

The two structures given here clearly show how the two different types of inversion are similar and different. In what follows, let us see these in more detail.

5. Explaining the Facts

Given these theoretical assumptions, we are then ready to discuss the consequences of our analysis, focusing on how the similarities and differences between the light and heavy inversions are accounted for.

5.1. Capturing the Similarities

As presented and hinted in the previous section, the similarities between the light and heavy inversions arise from the given architecture of type hierarchies: they both are alike in that they function as subtypes of *hd-topic-ph* in the constructional (phrasal) hierarchy dimension and *loc-inv-w* in the lexical hierarchy dimension. The similarities are drawn from when these two different dimensions are interacting.

First, in both constructions, the restriction on the head verb's ARG-ST can account for the ungrammaticality of examples such as (5)-(8), some of which are repeated here:

- (44) a. *Into the room rolled John the ball. (LI)
 b. *Into the room rolled the ball the man with long blond hair. (HI)
- (45) a. *In the room was knitting Robin. (LI)
 b. *In the room was knitting a woman with long blonde hair. (HI)

The verbs *rolled* in (44) and *knitting* in (45) select two NPs and one subject NP as their arguments. According to (32) and (33), such lexical entries can neither be analyzed as *lh-loc-inv-w* or *hv-loc-inv-w*.

Second, the freezing effects on both constructions shown in (9)-(10) are accounted for by the interactions of the lexical and constructional constraints. Some of the examples are repeated here:

- (46) a. *What / *Which one of the students majoring in linguistics does in the garden stand ___?
 b. *Which room did he say into ___ walked John / one of the students majoring in linguistics?
 c. *Did into the room walk a woman / one of the students majoring in linguistics?

The examples like (46)a is not possible where the NP is a *wh-phrase*. The present analysis takes the NP in both types of inversions to carry

the presentational focus regardless of its heaviness as seen from the hierarchy in (31). This has been the basic motivations for the inversion and is the reason for the NP to be a canonical syntactic-semantic element with no gap value. Meanwhile, the example (46)b, in which part of the topic PP is questioned, violates the independent constraint that nothing can be extracted out of the topic element (Bresnan (1994)). The unacceptability of (46)c is due to the constructional constraint in (36). In the HPSG theory, the only way of generating the SAI construction like (46)c is by the *head-sub-comp-ph* in which the NP functions as the immediate sister of the auxiliary verb *do*. (46)c does not match this constraint.

Third, the postverbal NP in both types of inversions carries focus as shown in (12), repeated here again:

- (47) A: I am looking for my friend Rose.
 B: #Among the guests of honor was sitting Rose (wearing big sunglasses).

This fact is accounted for by one of the constraints in (31), i.e., the NP argument of the inversion verb must carry a value in the FOCUS feature. However, the NP *Rose* in (47)b is a topic, given information.

Fourth, the preverbal PP in both types of inversion has topic properties and thus cannot be replaced with an indefinite pro-PP or contrastively focused as observed in (14)-(16). Some of the examples are repeated here:

- (48) a. *Somewhere was found a child (who seemed to be kidnapped a few months ago).
 b. #On the shelf sat a pink rabbit (with a blue ribbon), but not on the table.

This follows from one of the constructional constraints in (39), i.e., the preverbal PP plays the role of TOPIC. The topic is supposed to provide background information and thus should be a definite expression. This is why it even cannot bear a contrastive focus.

Fifth, as shown in (17)-(18), both types of inversion show a matrix clause effect and cannot occur in an embedded clause except when the embedded clause is headed by the complementizer *that*:

- (49) a. *Bill asked if near John's house lies buried treasure (that was hidden by the pirates).
 b. *Mary said [under the tree sat a woman (with long blonde hair)].
 c. Mary said [that under the tree sat a woman (with long blonde hair)].

The present analysis attributes this matrix-clause effect to the [IC +] feature inherited from the *hd-topic-ph* in both types of inversion. According to Ginzburg and Sag (2001), the IC feature is independently motivated to distinguish main clauses from clauses like relative clauses which cannot function as an independent clause. As shown in Bouma et al. (2001) and Ginzburg and Sag (2000), an embedded clause can behave like an independent matrix clause only when the complementizer *that* appears while a *that*-less embedded clause can never behave like an independent clause. This basic constraint with the [IC +] feature blocks the grammar from generating locative inversions (e.g., (49)a,b) since clauses headed with *if* or without an overt complementizer are always dependent clauses (i.e., [IC -]). However, both types of inversions are allowed when the complementizer *that* exists as shown in (49)c since here the embedded clause has the [IC +] feature.

Finally, as discussed earlier in (19), in both types of the inversion constructions the verb agrees with the postverbal NP. We repeat one example here:

- (50) Under the tree sits / *sit a woman (with long blonde hair).

The subject-verb agreement fact can follow from a theory of agreement in the ARG-ST, i.e., the postverbal NP is the subject at the ARG-ST (the least oblique element), and the verb agrees with this NP element though it is realized in the postverbal position (cf. Chung and Kim 2002).

5.2. Capturing the differences

The differences between the heavy and light inversions are also mainly due to the lexical properties of light inversion verbs and heavy inversion verbs, respectively. As we have seen, these verbs have their own lexical and constructional constraints. Let us see how this grammar

leads us to their differences.

First, as shown in (20), the light and heavy inversions show different patterns with respect to the weak cross-over effects, i.e., the former induces the amelioration of the WCO effect while the latter does not. Consider the data again:

- (51) a. In every dog's cage hung its collar. (LI)
 b. *Into every dog's cage hung on a hook its most attractive and expensive collar. (HI)

This contrast falls out naturally from the different grammatical statuses of the preverbal PP: as noticed from the hierarchy (31), the PP in (51) a is realized as the subject at the valence level whereas while the PP in (51)b is the slashed element and simply a filler. In terms of a traditional GB approach, the PP in the light inversion would be analyzed as an A-position while the PP in the heavy inversion occupies an A'-position.

Second, as already observed in (22), the PP in the light inversion cannot be extracted while the PP in the heavy inversion can be freely extracted out of a finite or non-finite clause. The typical contrast is mirrored here again:

- (52) a. *Into the room I claim / believe walked Robin. (LI)
 b. Into the room I claim / believe walked a ravenous horde of angry Tolstoy scholars. (HI)

In the present analysis, (52)a is blocked due to the constructional constraint in (36) which states that the SLASH value of the head daughter (the VP, *walked Robin*) be an empty set. It guarantees that no argument of the head verb can be slashed and extracted in an unbounded manner. In contrast, the PP in (52)b is inherently a gap in the ARG-ST as represented in (31). The slashed PP need not be realized in its local domain but could be unboundedly extracted.

Third, we also have observed different distributions of floated quantifiers and PRO control patterns in the two types, whose examples we repeat here:

- (53) a. *Into the cafeteria have both gone the students, I think. (LI)
 b. From this pulpit have both preached Cotton Mather's two closest and most trusted associates. (HI)

- (54) a. *Into the room expected PRO to walk Robin. (LI)
 b. From this pulpit expected PRO to preach a number of close associates of the great Cotton Mather himself. (HI)

The upshot of the analysis is to resort to the mapping relation between VALENCE and ARG-ST, with the assumption that the licensing of the floated quantifiers or controlling PRO is subject to the subjecthood at the valence level. As shown in (31), the light postverbal NP in (53)a or (54)a needs to be a complement (i.e., the value of the COMPS) and thus cannot license floated quantifiers or control PRO. However, the heavy postverbal NP in (53)b or (54)b needs to be the subject (i.e., the value of the SUBJ), and thus it can license the quantifiers or control PRO even though it appears at the right peripheral position.

Finally, another difference arises from the raising possibilities as shown in (27), repeated here in (55), where only the preverbal PP in the heavy inversion seemingly can go through the raising:

- (55) a. *Into the room appeared to be walking Robin slowly.
 b. Into the room appeared to be walking slowly a very large caterpillar.

This contrast can be obtained with the assumption that only the “genuine” subject can be raised, in which the “genuine subject” is the only element in the SUBJ value and at the same time the least oblique element in the ARG-ST level. The PP in (55)a is not the genuine subject because it is not the least oblique element at the argument structure level since NP is the least oblique element. Following Culicover and Levine (2001), we analyze the PP in (55)b as a filler, not as the raised subject. It appears to be raised simply because it is positioned before a raising verb while the real subject NP is heavy-NP shifted to the end of the sentence.

6. Conclusion

This paper discusses the similarities and differences between the two types of locative inversions, light and heavy locative inversions, couched upon the framework of HPSG. A crucial device of HPSG for our analysis is the type inheritance hierarchy system where constraints on a supertype are inherited to its subtypes when no conflict exists between

them.

The similarities between the light and heavy inversions are captured by the constructional type hierarchy in (36) as well as the lexical type hierarchy in (31). The interactions among the constraints on these induce their similarities in the topichood of the preverbal PP, lack of SAI, matrix-clause effect, focus property of the postverbal NP, subject-verb agreement, and the like. The different properties of the light and heavy locative inversions are captured by the assumption that they are separate constructions and thus have their own constructional and lexical subtype constraints. The different constructional constraints induce the differences in long extraction and apparent raising possibility, while different lexical constraints induce the differences in the amelioration possibility of the WCO effects, distribution of floated quantifiers, and control possibility of PRO.

As we have seen, our analysis claims that though both types of inversion exhibit intricate and complex properties, they could be followed from the interactions among constructional and lexical constraints, which otherwise would be quite inexplicable.

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key words: locative inversion, heavy inversion, light inversion, focus, topic, information packaging, HPSG

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Abstract

English displays two subtypes of locative inversions, light vs. heavy inversions, depending on the heaviness of the postverbal NP. This paper discusses how to analyze the similarities and differences between these two types of locative inversions under the framework of HPSG (Head-driven Phrase Structure Grammar). A crucial device of HPSG for our analysis is the type inheritance hierarchy where constraints on a supertype are inherited to its subtypes when no conflict exists between them. The similarities between the light and heavy inversions are captured by the constructional type hierarchy as well as the lexical type hierarchy. The different properties of the light and heavy locative inversions are captured by the assumption that they are separate constructions and thus have their own constructional and lexical subtype constraints.

The analysis presented here shows that the intricate and complex properties of these two related types of inversion could follow from the interactions among constructional and lexical constraints.