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Locative Inversion

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Abstract

Locative Inversion is one of what is called “deep unaccusative diagnostics.” However, close scrutiny of synchronic variations of Locative Inversion constructions makes an unaccusative analysis of it untenable and yields an empirically necessary constraint, which requires that an element which is informationally less familiar information in context appear in the right edge of sentence. The aim of this paper is to provide a straightforward and unified account for Locative Inversion by making use of the constraint and other well-established Optimality Theoretic constraints concerning Case, head, trace, and feature specification. The proposed hypothesis is that the constraints are stratified in the order enumerated and thus the optimal representation of Locative Inversion constructions is the one that best satisfies the stratified constraints.

Key words: *Locative Inversion, Optimality Theory, constraint, ranking, end focus*

1. Introduction

I-to-C movement of an auxiliary (i.e. Subject-AUX inversion) is a systematic syntactic phenomenon in the domain of a complementizer of matrix interrogatives in English. It is argued in Munemasa (2000, 2001a, 2001b) that Subject-AUX inversion in interrogatives is explained as a consequence of interactions of the Optimality Theoretic constraints cited below and other constraints, and that its language variation is ascribed to the different ranking of the same set of constraints.

CHAIN: One member of the chain of an argument must be Case-marked.

HEAD: A projection has an overt head.

trace: Trace is not allowed. (indicates “ungrammatical”)

NO-REDUNDANCY (*REDUN): Redundant feature specification is not allowed.

This paper demonstrates that the constraints establish

further empirical validity by proving that their interactions can provide a straightforward account for another type of inversion observed in English, i.e. Locative Inversion.

2. Previous Approaches

2.1 Unaccusative Diagnostics

Locative Inversion (henceforth, LI) has typically been viewed as involving the preposing of a PP.

(1) a. John walked into the room.

b. Into the room walked John

LI can be applied in a certain kind of embedded clause (see Hooper and Thompson (1973)).

(2) a. He said that a large fortress stood beyond the next hill.

b. He said that beyond the next hill stood a large fortress.

(3) a. He denied that the baby carriage rolled down the hill.

b. *He denied that down the hill rolled the baby carriage.

The status and position of the preposed PP in LI have

been a matter of controversy in the literature. Coopmans (1989), Rochemont and Culicover (1990), among others, propose that the preposed PPs are topicalized over the subject position into some other sentence-initial position. On the other hand, Bresnan (1994), Hoekstra and Mulder (1990), Watanabe (1993), Collins (1997), and so forth maintain that they move up to the subject position.

It has been widely known that LI is one of what is called “deep unaccusative diagnostics.” In LI constructions, the D-structure object of an unaccusative verb does not become an S-structure subject and thus maintains the post verbal position (Coopmans (1989), Bresnan (1994), Hoekstra and Mulder (1990), etc.).

(4) e [_{VP} V DP PP]

The PP moves up to the subject position at S-structure. However, the analysis poses many problems in that a variety of apparently unergative verbs can appear in LI and not all unaccusative verbs are found in LI, as Levin and Rappaport (1995) point out.

2. 2 Minimalist Approach

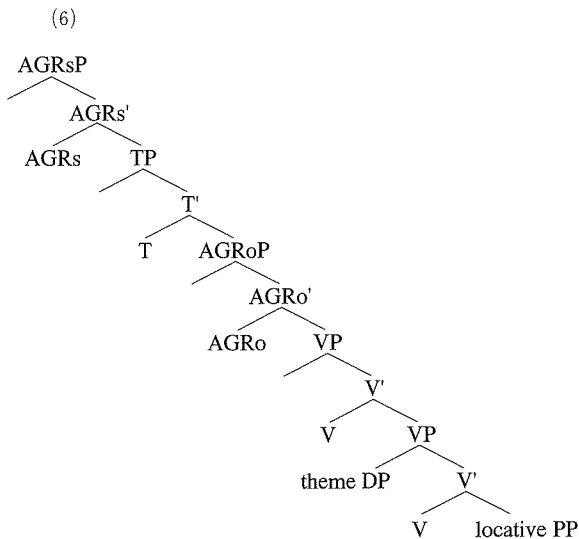
2.2.1 Watanabe (1993) and Collins (1997)

Among the approaches to LI based on the recent Minimalist framework, Watanabe (1993) makes a proposal about the unaccusativity restriction on LI in terms of Relativized Minimality and the notion of Equidistance.

(5) a. John rolled down the hill.

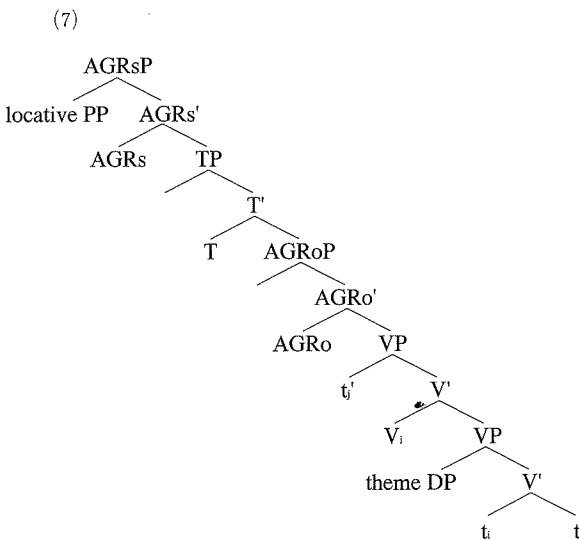
b. Down the hill rolled John.

Note that since unaccusative verbs do not have an external argument, their subject position should be empty. Employing the Agr-based theory of Chomsky (1993), Watanabe assumes that LI constructions such as (5b) have the following structure:



If the locative PP moves over the theme DP to AGRsP-SPEC by way of the possible landing site, i.e. the upper VP-SPEC, for its morphological necessity, it induces a potential Minimality violation, since it passes over its nearest potential governor.¹

However, the movement of the verb from its original position makes the upper VP-SPEC and the theme position equidistant as schematized in (7).



(8) $\text{MIN}(S)$, S a set of categories, is the smallest subset K of S such that for any $\gamma \in S$, some $\beta \in K$ reflexively dominates γ .

Thus the locative PP can move up to AGRsP-SPEC by way

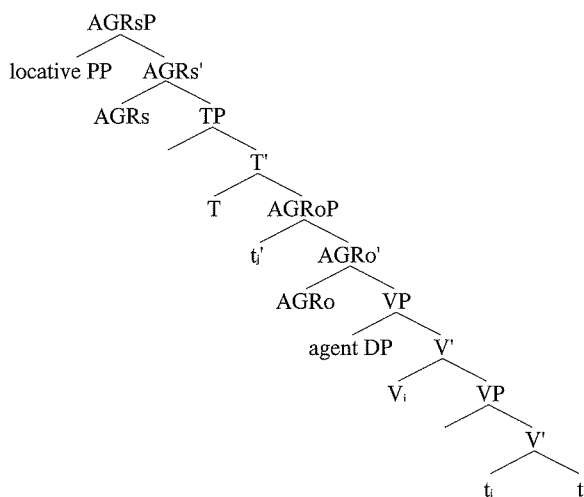
of the upper VP-SPEC. For the convergence of the derivation, the theme DP has to have its Case checked by some functional categories. According to Watanabe, the DP undergoes movement to AGRsP-SPEC at LF and AGRO checks its Case in tandem with V, which is responsible for the agreement between the verb and the DP.

On the other hand, unergative verbs cannot allow LI.

- (9) a. *Toward me looked a drunk.
- b. *On the corner smoked a man.
- c. *Onto the ground had spit a few sailors.

Since unergative verbs have an external argument, LI must move the locative PP over the external argument, as schematized in (10).

(10)



The movement of the locative PP to AGRoP-SPEC (a possible landing site) over the agent DP in the upper VP-SPEC induces a Minimality violation. Thus the derivation crashes, predicting no LI in unergative constructions.

Collins (1997) provides a similar approach to LI constructions. He assumes that clause structures are basically as follows:

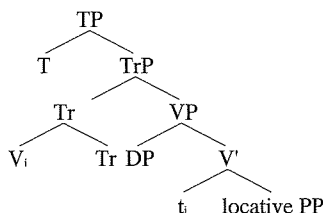
- (11) [CP C [TP [T' [Tr [VP V DP]]]]]

In the structure the external argument is not generated under the VP with the direct object, but rather is generated as the specifier position of a head that he calls Tr (Transitivity), which is a generalization of the CAUS head identified as the light verb *v* by Chomsky (1995: Chapter4). For transitive verbs, it checks accusative Case and assigns the external θ -role to its specifier, while it checks no accusative

Case and assigns no θ -role for unaccusative verbs. For all verbs, movement of V to Tr is obligatory, since the V feature of Tr is strong.

Given the assumption, the structure of LI after the construction of TrP and the operation Merge (T, TrP) will be as follows:

(12)



In (12), the DP in the VP-SPEC and the locative PP are in the minimal domain of the same head V. Thus the DP does not block movement of the locative PP to TP-SPEC, even though the DP has a D-feature that could enter into a checking relation with the strong EPP feature of T. In this case, Collins assumes that the EPP feature of T enters a checking relation with the D feature of the DP which the PP dominates or the set of features that may enter into a checking relation with the EPP feature of T which is widened from simply the D-feature of a DP to any categorial feature. Given this assumption, the movement of the locative PP would satisfy the Last Resort condition.

At LF, the formal features of the DP are raised to T. Tr is also raised and adjoined to T. The formal features of the verb enter a checking relation with the formal features of the DP, thus the derivation converges.

2.2.2 Counter-examples

The surface distribution of LI constructions appears to justify the claim that it can serve as an unaccusative diagnostics. LI is found with verbs that are regarded as the prototypical members of the unaccusative class, including certain verbs of appearance (e.g. appear, arise, emerge, etc.), verbs of existence (e.g. exist, flourish, linger, etc.), and verbs of inherently directed motion (e.g. come, go, arrive, etc.).² Passive transitive verbs, which are classed with unaccusative verbs in having no external argument, also figure prominently in LI constructions, contrasting with the active form of the same verbs.

- (13) a. On that table was placed John a beautiful silver dish.

b. *On that table placed John a beautiful silver dish.

However, as Levin and Rappaport (1995) report, the claim poses a problem that LI is a diagnostic for the unaccusative syntactic configuration in that not all unaccusative verbs are found in LI constructions, in particular, unaccusative verbs of change of state are typically not found in LI constructions, and moreover, a variety of apparently unergative verbs can appear in them.

(14) Unaccusative verbs of change of state

- a. *On the top floor of the skyscraper BROKE many windows.
- b. *On the streets of Chicago MELTED a lot of snow.
- c. *On backyard clotheslines DRIED the weekly washing.

Levin and Rappaport (1995:224)

(15) Unergative verbs

- a. Opposite the landing-place stood half-a-dozen donkeys with saddles on their backs and bunches of flowers in their bridles, and around them CHATTERED and SANG as many girls with the silver spadella stuck through their black trees and a red handkerchief tied across their shoulders. [A. Munthe, *The Story of San Michele*, 1]
- b. On the third floor WORKED two young women called Maryanne Thomson and Ava Brent, who ran the audio library and print room. [L. Colwin, *Goodbye without Leaving*, 54]

ibid.

Only some passive verbs are observed in LI, even though on an accusative analysis all verbal passives would meet its syntactic constraints because they have no external argument.

- (16) a. *On the kitchen WERE CHOPPED pounds and pounds of mushrooms.
- b. *To the tourists WERE SOLD the most garish souvenirs.

Levin and Rappaport (1995:250)

From these, the proposal that LI constructions serve as an unaccusative diagnostic and proposing an alternative account of its unaccusative like properties break down.

3. Discourse Function

3.1 Unaccusativity

An alternative account of the restriction of the sets of verbs attested in LI is provided by elaborating on the discourse function of LI constructions and showing how it imposes constraints on the verb in them.

Birner (1992,1994), based on extensive corpus study of various types of English inversions, demonstrates that the discourse function of all inversions including LI is to link relatively unfamiliar information to the prior context via the clause-initial placement of information that is relatively familiar in the discourse. On this analysis, the information presented by the postverbal DP in LI constructions must always be less familiar than the information presented by the NP in the preverbal PP. Birner describes the verbs in LI constructions as “informationally light.” Following Birner, Levin and Rappaport (1995) state as follows:

Presumably, if a verb in the locative inversion construction did contribute information that was not predictable from context, it would detract from the newness of the information conveyed by the postverbal NP. The discourse function of the construction would not be satisfied, and that instance of the construction would be excluded.

Levin and Rappaport (1995) provide further support for the restriction that the verb in LI constructions be informationally light in context. Externally caused verbs of change of state (e.g. melt, break, dry, grow, bake, bend, crease, etc.) which belong to unaccusative verbs are not found in LI constructions. This restriction is explained as a consequence of the discourse function of LI constructions. These verbs contribute discourse-new information by predicating an externally caused (i.e. unpredictable) change of state of their argument and thus are not informationally light, resulting in the incompatibility with LI constructions. However, verbs of this type can appear in LI constructions only when they have an existence sense, as in the following contrast.

- (17) a. In our garden GREW a very hardy and pest-resistant
- b. *In Massachusetts GROWS corn very slowly. (‘increase in size or maturity’)

Levin and Rappaport (1995: 236)

The change-of-state sense of the verb is not informationally light, since it contributes the information that the corn is getting taller and maturing. On the other hand, in (17a) the verb has an existence sense, and thus is informationally light, predicting the compatibility with LI constructions.

Contrary to the expectation that all passive verbs are expected to be found in LI constructions by virtue of an unaccusative analysis, only some passive verbs (verbs of putting, verbs of putting in a spatial configuration, verbs of attachment, verbs of image impression, verbs of creation, and verbs of perception) allow LI.

- (18) a. verbs of putting: display, embed, heap, locate, place, put, range, situate, store, ...
 b. verbs of putting in a spatial configuration: hang, lay, mount, perch, seat, suspend, ...
 c. verbs of attachment: glue, hook, lace, paste, pin, staple, ...
 d. verbs of image impression: engrave, imprint, inscribe, scrawl, scribble, stamp, write, ...
 e. verbs of creation: build, carve, cook, erect, ...
 f. verbs of perception: discern, glimpse, hear, realize, see, ...
- (19) a. Here and there over Jeff's Station's map WERE PLACED tiny red flags. [A.W.Upfield, *The Sands of Windee*, 124]
 b. Around him WERE HUNG photorealistic paintings of enlarged cash-register receipts... [A Beattie, *Picturing Will*, 73-74]
 c. To each side of the straw-stuffed pack WERE HOOKED the saddle-bags and water-drums. [A.W. Upfield, *Man of Two Tribes*, 37-38]

Levin and Rappaport (1995: 245-246)

A common property all these verbs share is that they are described as verbs of causing something to exist or appear, put differently, 'cause to come to be,' 'cause to be,' or, some entity or event impinges or comes to impinge on the scenes, which is responsible for verbs of perception. Thus these passive verbs are consistent with the requirement that the verb in LI constructions be informationally light.

3.2 Unergative Verbs

A variety of apparently unergative verbs can appear in LI constructions, which are verbs of light emission and sound

emission, agentive verbs of manner of motion, verbs of body internal motion, and a scattering of other activity verbs. The following data concerning these verbs are from Levin and Rappaport (1995: 255-257).

(20) Verbs of emission

- a. Verbs of light emission: beam, blaze, blink, burn, flame, flare, flash, flicker, glare, gleam, glimmer, glint, glisten, glitter, scintillate, shimmer, shine, sparkle, twinkle, etc.
 b. Verbs of sound emission: bang, beep, blare, blast, blat, boom, chatter, creak, groan, growl, hiss, hoot, howl, hum, jingle, moan, murmur, rattle, ring, roar, rustle, scream, screech, shrill, sing, sizzle, snap, splash, splutter, sputter, squawk, squeak, squeal, squelch, strike, swish, tick, tinkle, toll, toot, whir, whish, whistle, etc.
 c. Verbs of smell emission: reek, smell, stink, etc.
 d. Verbs of substance emission: belch, bubble, dribble, drip, emanate, exude, leak, ooze, pour, puff, radiate, seep, shed, spill, spout, sprout, spurt, squirt, steam, stream, sweat, etc.

- (21) Agentive verbs of manner of motion: amble, bounce, bound, bowl, canter, crawl, creep, dart, dash, drift, file, flit, float, fly, glide, jump, leap, limp, lope, mince, nip, pad, parade, ramble, roam, roll, rove, run, rush, scurry, scutter, scuttle, shamble, shuffle, sidle, tramp, travel, trek, troop, trot, trudge, walk, wander, whiz, etc.

- (22) Verbs of body internal motion: flutter, tremble, shiver, sway, wave, etc.

(23) Verbs of sound emission and light emission

- a. On one hand FLASHES a 14-carat round diamond; on the other hand SPARKLES an 8-carat stone flanked by the diamond-studded initials WN. [*Philadelphia Inquirer*, "To the Top the Hard Way," 1-D]

- b. On the folds of his spotless white clothing, above his left breast, GLITTERED an enormous jewel. [N. Lofts, *Silver Nutmeg*, 460]

(24) Agentive verbs of manner of motion

- Inside SWAM fish from an iridescent spectrum of colors ... [J. Olshan, *The Waterline*, 177]

(25) Verbs of body-internal motion

- a. ...before the front there stretched a plateau whereon stood a flagstaff and spar, from the point of which

FLUTTERED a red ensign. [E. Phillpotts, *The Red Redmaynes*, 70]

- b. ... in this lacey leafage FLUTTERED a number of grey birds with black and white stripes and long tails. [Z. Grey, *Riders of the Purple Sage*, 62]

(26) Scattering of other activity verbs

- a. Opposite the landing-place stood half-a-dozen donkeys with saddles on their backs and bunches of flowers in their bridles, and around them CHATTERED and SANG as many girls with the silver spadella stuck through their black tresses and a red handkerchief tied across their shoulders. [A. Munthe, *The Story of San Michele*, 1]
- b. He thought of the free-form pool behind the bougainvillea hedge there, clogged with rafts of Styrofoam on which DOZED naked oily bathers lying on their backs wide open to that sun. [A. Marshall, *The Brass Bed*, 228]

According to Levin and Rappaport, in these LI constructions with unergative verbs the postverbal DPs are less familiar than the DPs in the preverbal PPs, and moreover, they are predictable from the postverbal DPs and only describe characteristic activities of their argument's referent. Thus they qualify as informationally light in context, predicting their occurrence in LI constructions.³

Since unergative verbs have an external argument, LI must move the locative PP over the external argument, inducing a Minimality violation. Thus an unaccusative analysis to LI constructions loses its force as a whole.

4. Postverbal DPs

Having argued that an unaccusative analysis of LI constructions is untenable, we consider that the postverbal DPs in LI constructions undergo movement from their base-generated position to the focus position (i.e. VP-adjoined position).

4.1 Extraposition

As mentioned above, in LI constructions the postverbal DPs have to be less familiar than the preposed PPs in discourse function. The verbs do not contribute new information and thus qualify as informationally light in context. This discourse restriction holds for extraposition from NP

as well. An extraposed element is considered to be (right-) adjoined to IP or VP (cf. Baltin (1978, 1981, 1987), Barss (1986), Emonds (1976), Gelderen (1985), Guéron (1980), Guéron and May (1984), Reinhart (1980), Rochmont and Culicover (1990), etc.).

Let us consider extraposition from NP and the landing site of the extraposed element. In the literature on the landing site of the extraposed element from object NP, it is considered to be VP-adjoined position.⁴ One type of this evidence comes from VP-deletion, VP-preposing, and pseudo-clefting.

- (27) a. John met a man last week (who was) from Philadelphia, and George (met a man last week (who was) from Philadelphia did) too.
- b. John said he would meet a man at the party (who was) from Philadelphia, and meet at the party (who was) from Philadelphia he did.
- c. What John did was draw a picture on the wall of his brother.

Culicover and Rochemont (1990: 28)

- (28) a. John met a man last week (who was) from Philadelphia, and George (met a man last week/*did who was) from New York.
- b. *John said he would meet a man at the party (who was) from Philadelphia, and meet a man at the party he did (who was) from Philadelphia.
- c. *What John did of his brother was draw a picture on the wall.

ibid.

Undergoing VP-deletion, VP-preposing, and pseudo-clefting with the extraposed element from object NP stranded induces the ungrammaticality. Given this, the extraposed element is (right-) adjoined to VP. Furthermore, the following paradigms provide support for the claim that the extraposed element from object NP is (right-) adjoined to VP.

- (29) a. *She told many people about the concert who Mary made nervous.

Guéron and May (1984: 10)

- b. *She_i invited many people to the party that Mary_i didn't know.

Culicover and Rochemont (1990: 28)

- (30) a. I sent her_i many gifts last year that Mary_i didn't like.
- b. *I sent her_i many gifts that Mary_i didn't like last

year.

Culicover and Rochemont (1990: 29)

A condition C violation in (29) and (30) is ascribed to the fact that the pronoun coindexed with the R-expression *Mary* c-commands it. If the extraposed element which contains the R-expression did not (right-) adjoined to VP, (29) and (30) would be ruled in.

Extraposition from NP is subject to the restriction that verbs in the constructions express existence or appearance, or qualify as informationally light in context, and the extraposed element bear less familiar information. In the case where the verbs in the constructions bear new-information or are assertive, extraposition from NP induces the ungrammaticality, be the verbs unaccusative or unergative. Some examples concerning this and some of verbs which do not allow extraposition from NP are listed in (31)-(34).⁵

- (31) a. A man came into the room with blond hair.
 b. *A man {whispered/grumbled/yelled} yesterday with blond hair.
- (32) a. A man talked yesterday with blond hair.
 b. A man gave a talk yesterday with blond hair.
 c. *A man hit Mary with blond hair.
 d. *A book delighted Mary by Charles.

Guéron (1980: 63)

- (33) a. A review appeared of Chomsky's new book.
 b. *A review appeared of the book.
 c. *A review appeared of it.
- (34) be discussed, be abandoned, be denied, be destroyed, be ignored, be refused, be rejected, annoy, bother, confound, die, disappear, vanish, worry, ...

The verbs in (31b) and (32c,d) do not express appearance or existence but are used assertively, whereas the verbs in (32a, b) do not qualify as informationally light. In (33b, c) the elements the extraposed PP dominate are a definite noun phrase and a pronoun, respectively, and thus they qualify as familiar information, although the verb in (33) express appearance.

From these properties that extraposition from NP and LI constructions share, it is predicted that the post verbal DPs in LI constructions may be (right-) adjoined to VP. Supporting evidence for this comes from the following paradigm (cited in Levin and Rappaport (1995: 266)), in which the unaccusative verb co-occurring with two PPs and the post-verbal DP occurs in the right position to the stranding PP

not the preposed PP.

- (35) Out of the mud-brick ruins of temples and ziggurats HAVE EMERGED over the last century the traces of cities whose names evoke the rise human civilization: Babylon and Kish, Nimrud and Nippur, Ur and Uruk. [J. N. Wilford, "To Endangered List in Gulf, Add Archeology," 1]

Furthermore, adverbials following a verb in VP precede the postverbal DPs in LI constructions as follows:⁶

- (36) a. Into a deep sea sank slowly a wrecked ship.
 b. Into a room ran fast a man from London.

The standard criteria for A-bar dependency observed in *wh*-movement confirm the claim that the postverbal DPs is adjoined to VP. As already noted, an extraposed element is considered to be an adjoined position, that is, an adjunction structure. Extraction from within it is banned because adjunction creates an island for further extraction.

- (37) a. *Who will a book come out by t?
 b. *What will a review come out about t?

A similar case is observed in LI constructions. If the post-verbal DPs occupy object positions, as assumed in an unaccusative analysis, *wh*-extraction from within it should be possible, since in general an object, being a complement to a verb, readily undergoes *wh*-extraction. However, the opposite is the case.

- (38) a. *What kind of mushrooms do you think on these trials can be found specimens of t?
 b. Who did John see a picture of t?

The postverbal DP in (38b) moves up to IP-SPEC to obtain nominative Case because passive verbs have no ability to assign Case. If the DP maintained the specifier position of IP, a natural linear order of LI constructions broke down. From this, it follows that the postverbal DPs are (right-) adjoined to VP.

4.2 End Focus

A question as to why the postverbal DPs in LI constructions occupy an adjoined position, that is, VP-adjoined position. A less familiar information, put differently, an asserted information, tends to occupy a right edge of a sentence. Suppose then that such syntactic phenomenon is due to a constraint favoring just this situation, which I call END-FOCUS.

- (39) END-FOCUS

An element which is informationally less familiar information in context must appear in the right edge of sentence.

Given this constraint, the subject DPs in LI constructions are (right-) adjoined to VP, which is a focus position, if they bear informationally less familiar information in context. The movement of subjects in LI constructions leads to a *trace violation, which has the benefit of allowing END-FOCUS to be satisfied. Thus END-FOCUS dominates *trace.

However, if subjects in LI constructions are (right-) adjoined to VP, why are locative PPs preposed in LI constructions in spite of a *trace violation? This is issued in the next subsection.

5. Preposed PPs

5.1 A-dependency of Preposed PPs

The driving force of fronting locative PPs in LI constructions is ascribed to subjecthood of them. It has been argued in the literature that the preposed PPs in LI constructions occupy the specifier position of IP (Hoekstra and Mulder (1990), Watanabe (1993), Bresnan (1994), etc.). One type of the evidence for preposing to IP-SPEC, as pointed out by Hoekstra and Mulder (1990), concerns I-to-C movement of auxiliaries. Preposed *wh*-locative PP does not yield the I-to-C movement just like a subject *wh*-phrase.

(40) a. In which garden stands a beautiful fountain?

b. *In which garden does stand a beautiful fountain?

(41) a. Who stands in the garden?

b. *Who does stand in the garden?

If the preposed PP occupies IP-SPEC, I-to-C movement of an auxiliary does not occur as in the case where a *wh*-subject does not allow I-to-C movement of an auxiliary.

Evidence for subjecthood of the preposed PP in LI constructions comes from "subject raising." Stowell (1981) and Bresnan (1994) report that a preposed PP can be further raised to a higher IP-SPEC in raising constructions and this type of raising is observed in passive constructions as well.

(42) a. On the hill appears to be located a cathedral.

b. In these villages are likely to be found the least examples of this cuisine.

Bresnan (1994: 96)

(43) In the cave were believed to dwell many nymphs.

The preposed PP in (42) moves up to the specifier position of the embedded IP and then undergoes raising to the matrix IP-SPEC. This also holds for (43). If, as Coopmans (1989) suggests, the preposed PP moved up to CP-SPEC, the sequential movement of the PP in (42) and (43) would not be predicted.

That-trace effect is generally considered to be evidence for subjecthood (Stowell (1981), Hoekstra and Mulder (1990), Bresnan (1994), among others), since only subjects show this effect.

(44) a. *Who do you think that t bought the car?

b. Who do you think that John likes?

(45) Into which room did you say (*that) t walked the children?

Hoekstra and Mulder (1990: 33)

The preposed PP in LI constructions is considered to bear subjecthood because it passes the criteria for A-dependency.

(46) We suddenly saw how into the pond jumped thousands of frogs t.

Hoekstra and Mulder (1990: 32)

If the preposed PP in (46) occupied A-bar position, the Relativized Minimality would not be respected and thus (46) would be ruled out.

Furthermore, LI constructions do not exhibit weak cross over effects like raising constructions, which are standard criteria for A dependency.

(47) Who_i appears to his_i mother t_i to be a genius? (raising)

(48) a. In the northeast corner of the quadrangle_i stands its_i most famous structure.

b. In the northeast corner_i of the room can its_i sole exist.

From these, it follows that the preposed PPs in LI constructions undergo A-movement and bear subjecthood.

5.2 Optimality Theoretic Analysis

With this much background, let us consider the interactions of the constraints presented in this paper. As already mentioned, under unaccusative diagnostics in LI constructions subjects are base-generated as postverbal objects of unaccusative verbs, whereas they are base-generated in VP-SPEC in the case where the verbs are unergative.

(49) a. [_{VP} [_V V DP locative PP]] (unaccusative)

b. [_{VP} subject [_V V locative PP]] (unergative)

In (49a) and (49b) the subject DP is Case-marked by the verb, respecting CHAIN.

Under the VP-internal subject hypothesis a subject is always raised from VP-SPEC to IP-SPEC. However, under the Optimality Theoretic analysis, the VP-internal subject hypothesis is also stated in an alternative way. Grimshaw (1997) uses independently necessary constraints on subject. The constraint on subject corresponds essentially to Chomsky's Extended Projection Principle (EPP), which requires that a clause have a subject. There are two alternative formulations of the condition in favor of a constraint based theory. The constraint requires that the highest A-specifier in a clause must be filled, or requires that the specifier of the highest 'I-related' head must be filled, where 'I-related' includes V, T, Agr, Neg, and so on. This constraint is employed here as EPP and is dominated by CHAIN by assumption.

With this background, let us take a look at (49) again. When the subject DP remains in its original position in (49a), it results in the ill-formedness, since it does not occupy the highest A-specifier in the clause or the specifier of the highest I-related head (i.e. VP-SPEC in the case of (49a)) and thus induces an EPP violation. Thus the subject DP undergoes movement to VP-SPEC.

However, when the subject bears less familiar information in context in (49a), there are two conceivable derivations: by virtue of the requirement of END-FOCUS it moves from its base-generated position to VP-adjoined position in one swoop, or it does by way of VP-SPEC.

- (50) a. [_{VP} [_{V'} V t locative PP] DP]
- b. [_{VP} t' [_{V'} V t locative PP] DP]

In the case of (50b), however, the sequential movement of the subject DP has two *trace violations, thus the representation of (50a) is the winner. In spite of this, (50a) induces an EPP violation, since no subject occupies the highest A-specifier in the clause or the specifier of the highest I-related head. To eschew such a situation, the locative PP undergoes movement to VP-SPEC, as schematized in the last candidate in the tableau 1 ([+F] means focal element).

Similarly, in LI constructions including unergative verbs, when a subject bears less familiar information in context, after Case-marking by a verb it undergoes movement from its base-generated position (i.e. VP-SPEC) to VP-adjoined position by virtue of END-FOCUS.

As mentioned before, LI is blocked, when a verb, be it unaccusative or unergative, bears less familiar information in context. If in this case the subject does not bear less familiar information, it does not undergo movement to VP-adjoined position, since END-FOCUS is respected by the verb. However, if the subject bears less familiar information and thus undergoes movement to VP-adjoined position by virtue of the requirement of END-FOCUS, the representation will have two end focal elements. It results in the redundancy concerning end focus, predicting a *REDUN violation. *REDUN dominates HEAD and HEAD dominates EPP (see Munemasa (2000, 2001a, 2001b)). Thus *REDUN dominates EPP as in the tableau 3.

Tableau 1 Unaccusative

Candidates	CHAIN	*REDUN	EPP	END-FOCUS	*trace
[_{VP} [_{V'} V DP [+F] locative PP]]			*!	*	
[_{VP} DP [+F] [_{V'} V t locative PP]]				*	*
[_{VP} [_{V'} V t locative PP] DP[+F]]			*!		*
☞ [_{VP} locative PP _j [_{V'} V t _i] DP _i [+F]]				☞	**

Tableau 2 Unergative

Candidates	CHAIN	*REDUN	EPP	END-FOCUS	*trace
[_{VP} DP [+F] [_{V'} V locative PP]]				*!	
[_{VP} t [_{V'} V locative PP] DP [+F]]			*!		*
☞ [_{VP} locative PP _j [_{V'} V t _i] DP _i [+F]]					*

Tableau 3 Unaccusative

Candidates	CHAIN	*REDUN	EPP	END-FOCUS	*trace
[_{VP} [_V V [+F] DP [+F] locative PP]]		*!	*	**	
☞ [_{VP} DP [+F] [_V V [+F] t locative PP]]				*	*
[_{VP} [_V V [+F] t locative PP] DP [+F]]		*!	*		*
[_{VP} locative PP] _j [_V V [+F] t _i t _j] DP _i [+F]]		*!			**

Tableau 4 Unergative

Candidates	CHAIN	*REDUN	EPP	END-FOCUS	*trace
☞ [_{VP} DP [+F] [_V V [+F] locative PP]]				*	
[_{VP} t [_V V [+F] locative PP] DP [+F]]		*!	*		*
[_{VP} locative PP] _j [_V V [+F] t _i] DP [+F]]		*!			*

As illustrated in the second candidate in the tableau 3 and the first candidate in the tableau 4, the subject bearing less familiar information does not move to VP-adjoined position and thus leads to an END-FOCUS violation, which has the benefit of allowing *REDUN to be satisfied. Thus the movement of the subject to VP-adjoined position is blocked and thus LI does not occur when the verb bears less familiar information in context.

6. Concluding Remarks

It has been argued that systematical occurrence of LI immediately follows from the interactions of the following stratified constraints: CHAIN >> *REDUN >> EPP >> END-FOCUS >> *trace. The analysis based on the Optimality Theoretic constraints presented thus far establishes further empirical validity by providing a unified account for LI. In view of this, the constraints are tenable enough to do primary work in a wide variety of explanations of inversion phenomena.

Notes

1. The definition of the Relativised Minimality proposed by Rizzi (1990) is as follows:

X α -governs Y only if there is no node Z such that

(i) Z is a typical potential α -governor for Y,

(ii) Z c-commands Y and does not c-command X.

2. Verbs of manner of motion and verbs of sound emission are found in LI constructions when they take directional phrase complements.

3. It is reported that modal auxiliaries and perfective aspect are not allowed to be in LI constructions.

(i) a. *Down the hill may roll the baby carriage.

Coopmans (1989: 729)

b. *Out of this courtroom must walk a judge.

Rochemont (1978: 22)

c. *Down the stairs has fallen the baby.

Coopmans (1989: 729)

d. *Down the hill has rolled the carriage.

Rochemont (1978: 22)

However, some speakers judge LI constructions with modal auxiliaries or perfective aspect as acceptable.

(ii) a. Out of that courtroom will walk a judge.

Rochemont (1978: 23)

b. Into the room has just walked John.

Rochemont and Culicover (1990: 95)

This acceptability may be due to satisfaction of discourse function of the constructions. I leave the matter open, how-

ever.

4. We do not envisage the landing site of the extraposed element from subject NP, since there is a case where a subject undergoes movement from VP-SPEC to IP-SPEC and then the extraposed element is (right-) adjoined to IP.

5. In LI constructions as well, pronouns are not allowed to be in a postverbal position (see, Emonds (1976), Coopmans (1989), Bresnan (1994), etc.) if they are not deictic pronouns with emphasis but anaphoric pronouns.

(i) Anaphoric Pronouns

- a. *Into the building ran he.
- b. *At the foot of the mountain lived they.
- c. *Down the hill rolled it.

(ii) Deictic Pronouns

- a. Into the forest ran HIM.
- b. Next to his father stood HER.

6. Note that adjunction to V' or VP is admitted to accommodate the position of the adverb in (36).

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