Mixed Functional Properties in English Stylistic Inversion*

Chan Chung

Dongseo University

Abstract

One of the controversial issues in English stylistic inversion (SI) construction (e.g., *Into the room walked a woman*) is the functional status of preverbal PP and postverbal NP. Based on the distributional parallels among the PP, NP, ordinary subject and topic, this paper proposes that the PP in SI has a dual function as a subject and topic, while the NP also has some subject properties that the PP does not have. These mixed functional properties of the PP and the 'double' subject properties of SI are analyzed in the theory of HPSG, especially with the versions recently developed by Sag 1997, Manning and Sag 1999 and Ginzburg and Sag 2001, which posit the notions of the multiple type inheritance hierarchy and dissociation between the argument and valence structures. This analysis claims that the SI construction needs to simultaneously satisfy two general, independent constraints, *head-subject-phrase* and *head-filler-phrase*, as well as the construction specific lexeme-level constraint. This view suggests that the English SI construction is an instance of peripheral phenomena whose construction specific constraints are inherited from more general core constraints.

1. Introduction

A typical example of the stylistic inversion (henceforth SI), also often called locative inversion, is in (1):

(1) Into the room walked a woman.

This paper has two goals. One is to explore the functional status of the preverbal PP and the postverbal NP in the SI construction. Regarding this matter, three types of analyses have been suggested: (i) the preverbal-PP subject hypothesis (Levine 1989, Bresnan 1994, Levine and Culicover 2001); (ii) the postverbal-NP subject hypothesis (Emonds 1976, Iwakura 1978, Rochemont and Culicover 1990, and Kathol and Levine 1992); and (iii) the expletive-*there*/empty-category subject hypothesis (Gazdar and Pullum 1982, Coopmans 1989, and Postal 1977). Based on the distributional parallels among the preverbal PP, postverbal NP, ordinary subject and filler, this paper takes a middle road and proposes that in SI, the preverbal PP

* Earlier versions of this paper were presented at the 2001 HPSG spring workshop hosted by the Korean Society for Language and Information and at the 8th international HPSG conference held in Trondheim, Norway. I would like to thank Hee-Rahk Chae, Elisabet Engdahl, Bob Levine, Jong-Bok Kim, Carl Pollard, Byong-Rae Ryu, Ivan Sag, Eun-Jung Yoo, and other audiences for their comments and suggestions. My special thanks also go to two anonymous reviewers of the 8th international HPSG conference for their valuable comments and corrections. Remaining errors are of course all mine. My email is cchung@dongseo.ac.kr.

Proceedings of the 8th International HPSG Conference, Norwegian University of Science and Technology (3-5 August 2001)
Frank van Eynde, Lars Hellan and Dorothee Beermann (editors)
2002.CSLI Publications. http://csli-publications.stanford.edu/

functions as both the subject and topic at the "shallow" valence level, whereas the postverbal NP serves as the subject at a "deeper" argument structure level.

The other goal is to explore how the mixed functional analysis can be achieved in the HPSG theory. Sag 1997, Manning and Sag 1999 and Ginzburg and Sag 2001 provide a foundation for the dual function analysis with the notions of multiple inheritance and dissociation between the argument and valence structures. I propose that two general constraints on *head-subject-phrase* and *head-filler-phrase* need to be simultaneously satisfied in SI through the multiple inheritance mechanism, i.e., the combination of two general construction types results in an idiosyncratic SI construction type.

This paper is organized as follows. Section 2 discusses some general properties of SI. In section 3, the mixed functional properties of the preverbal PP and the "double" subject properties in SI are discussed. Section 4 proposes a new analysis within the HPSG framework and discusses its consequences. Section 5 is the conclusion.

2. General Properties of the SI Construction

2.1 SI vs. Presentational-*there* inversion

There have been studies proposing that SI is derived from the Presentational-*There* Inversion (henceforth PTI), or treating either of them as an instance of the other (Gazdar and Pullum 1982, Coopmans 1989, and Postal 1977). However, there are several studies opposing the position, which convincingly argue that SI and PTI are two different kinds of constructions, and thus that SI cannot be derived from PTI (Iwakura 1978, Green 1985, Levine 1989, Rochemont and Culicover 1990 and Bresnan 1994). Some of the arguments are illustrated below.

The PTI construction in (2) requires the postverbal NP be heavy or indefinite, while SI in (3) does not.

(2) a. There still stands on his desk the bowling trophy he won last year.
(Aissen 1975)
b. There ran into the garden *Kim/*the cat/?? the orange cat/an orange cat.
(Green 1985)
c. Into the garden there ran *Kim/*the cat/?? the orange cat/an orange cat.
(Green 1985)

(3) Into the garden ran Kim/the cat/an orange cat. (Green 1985)

Also note that we can easily find cases where the SI lacks the PTI source, as pointed out by Green 1985 and Bresnan 1994. For example, the SI in (4a) does not have its PTI counterpart, as shown in (4):

(4) a. Into the game now is the fullback Jenkins.
b. *There is the fullback Jenkins/a halfback I don't recognize into the game.
c.*There is into the game the fullback Jenkins.
d.*Into the game there is the fullback Jenkins.

Based on these observations, this paper assumes that SI and PTI are separate constructions and

focuses only on SI.

2.2 Unaccusativity

The contrast between (5) and (6) shows that SI cannot occur with a verb with a direct object (Coopmans 1989 with some slight modifications):

(5) a. Into the room rolled a ball.
b. Onto the track ran a horse.
c. Down the street walked a black dog.

(6) a. *Into the room rolled a ball John.
b. *Onto the track ran a horse a man.
c. *Down the street walked a black dog an old woman that I didn't know.

Coopmans 1989 argues that verbs triggering SI such as *lie, run, walk,* etc. are unaccusative verbs, and that these verbs have a VP-internal subject and locative PP complement. Furthermore, the locative PP fronted to COMP allows the VP-external subject position to be occupied by an empty expletive. According to this analysis, each sentence in (6) with a direct object is ungrammatical since it has a non-expletive VP-external subject (e.g. *John, a man,* and *an old woman that I didn't know*) in addition to an VP-external expletive empty subject.

Supporting his argument, Coopmans uses the *without . . . ing* construction. According to Postal 1977, the controller of the . . . *ing* form must be the subject of the main verb, and thus the ill-formedness of (7) is evidence for the nonsubjecthood of the postverbal NP.

(7) a. Two sheiks lay near the oasis without PRO talking.
b. ?/*Near the oasis lay two sheiks without PRO talking.

Coopmans argues that in (7b), the postverbal NP is internal within the VP headed by the unaccusative verb *lay* and cannot be the controller of *talking*. He concludes that the real subject of SI is not the postverbal NP but the VP-external empty subject.

One difficulty with this analysis is that the contrast in (7) provides no conclusive evidence for the null subject hypothesis in SI, i.e., the non-subject property of the postverbal NP does not necessarily entail the null subject in the English SI since the preverbal PP can be assumed to be the subject in that case. Regarding this null subject hypothesis, Bresnan 1994, and Kathol and Levine 1992 point out (i) that the existence of unaccusative constructions in Dutch does not guarantee a null subject in the English SI, and (ii) that the SI lacks a plausible expletive source (e.g., no PTI counterpart in (4)).

2.3 Freezing Effect

It has been observed that syntactic rules such as *wh*-exraction, topicalization, subject-aux-inversion do not apply to the SI construction as shown in (8):

(8) a. *Who(m) did he say into the room walked ___?
b. *The woman, into the room walked ___.
c. *Did into the room walk a woman?
d. *Which room did he say into ___ walked John?

This phenomenon is called the "freezing effect" (Gazdar and Pullum 1982, Rochemont 1986, Rochemont and Culicover 1990, among others)).

According to Rochemont 1986, the SI construction is one of the structural focus constructions where focus lies on the postverbal NP. Similarly, Green 1985 proposes that in SI, the preverbal PP provides background information, while the postverbal NP introduces a new participant to the established background.

To account for the freezing effect, Rochemont 1986 assumes that the focus construction is derived by stylistic rules, which apply after the S-structure, and thus that syntactic rules such as *wh*-extraction, topicalization and subject-aux-inversion cannot apply in this construction. However, Levine and Culicover 2001 claim that the preverbal PP in the SI induces amelioration of the weak cross-over effect, as shown in (9), which suggests that the placement of the PP is not simply a matter of stylistic rules:

(9) a. *Into every dog$_i$'s cage its$_i$ owner peered.
b. Into every dog$_i$'s cage peered its$_i$ owner.

2.4 Light Inversion vs. Heavy Inversion: Culicover and Levine 2001

Culicover and Levine 2001 (C&L) propose that a light inversion (LI) and a heavy inversion (HI) have many distinctive properties and that they need to be analyzed as two different kinds of constructions. According to them, some examples often considered in literature as instances of genuine SI (LI in their terms) are actually instances of HI. In HI, the extraposed NP is focus-stressed or heavy, and the preverbal PP is topicalized. They claim that the analysis of SI proper needs to rule in only the LI examples while ruling out the HI examples. Some of the crucial examples in C&L showing the differences are illustrated below.

First, an unergative verb like *sleep* does not allow SI (e.g., (10a)), while it allows HI (e.g., (10b,c)):

(10) a. *In the room slept Robin fitfully. (LI = SI)
b. Remember Robin? Well, in the room slept fitfully . . . ROBIN! (HI)
c. In the room slept fitfully the students in the class who had heard about the social psych experiment that we were about to perpetrate. (HI)

Second, the preverbal PP cannot be long extracted out of an embedded non-finite VP or finite clause (e.g., (11a) and (12a)), while such long extraction is possible in HI (e.g., (11b,c) and (12b,c)):

(11) a. *Into the room I expected ___ to walk Robin. (LI = SI)
b. Into the room I expected ___ to walk . . . ROBIN! (HI)
c. Into the room I expected ___ to walk a group of students in the class who had heard about the social psych experiment that we were about to perpetrate. (HI)

(12) a. *Into the room I claim/believe ___ walked Robin. (LI = SI)
b. Into the room I claim/believe ___ will walk . . . ROBIN! (HI)
c. Into the room I claim/believe ___ will walk a group of students in the class who had heard about the social psych experiment that we were about to perpetrate. (HI)

Third, the raising-to-subject of the preverbal PP is not allowed (e.g., (13a)), while HI makes an illusion of raising (e.g., (13b)):

(13) a. *Into the room appeared to walk Robin slowly. (SI = LI)
b. Into the room appeared to walk slowly a very large caterpillar. (HI)

While LI and HI have the distinctive properties, they also have some apparent common properties, e.g., the existence of a locative PP dependent, preverbal placement of the PP, postverbal placement of the NP, and incompatiblity with an overt object. Despite these similarities, this paper follows the view of C&L and focuses only on the analysis of the genuine SI cases, leaving the relation between the SI and HI for further studies.

Bresnan 1994 does not distinguish LI from HI and proposes that the preverbal PP in SI is "interpreted" as indirectly filling the subject position in the f-structure by means of topicalization in the c-structure. A problem with her analysis is that it wrongly predicts the examples in (11a), (12a) and (13a) to be well-formed.

3. Mixed Functional Properties in the SI Construction

The arguments in SI seem to have mixed functional properties. The preverbal PP in SI has "some" properties of a subject as well as of a filler (topic), whereas the postverbal NP has some "other" subject properties that the preverbal PP does not have. The purpose of this section is to discuss these mixed functional properties.

3.1 Subject Properties of the Preverbal PP

First, a piece of evidence for the subjecthood of the locative PP arises from a tag question in (14) (Bowers 1976):

(14) a. In the garden is a beautiful statue, isn't there?
b. *In the garden is a beautiful statue, isn't it?

Second, as shown in (9) in section 2, the preverbal PP in the SI induces amelioration of the weak cross-over effect. It suggests that the PP be in an A-position and thus be a subject (Culicover and Levine 2001).

Third, the following coordination constructions also indirectly support the subjecthood of a preverbal PP in SI:

(15) a. [In that garden]$_i$ stands an elegant fountain and dwells an interesting dwarf ___$_i$. (Levine 1989)
b. *[In that garden]$_i$ stands an elegant fountain and an interesting dwarf dwells ___$_i$.

(15a) suggests that the preverbal PP and the rest of the sentence form separate constituents. If we assume the preverbal PP is a topic and the postverbal NP a subject, then we may explain the grammaticality of (15a) because both conjuncts are sentences with a PP gap. Under this assumption, however, it is not clear how the ungrammaticality of (15b) is explained, i.e., under this assumption, both conjuncts are still sentences with a PP gap as in the case of (15a), but (15b) is ungrammatical. It might be argued that (15b) is ill-formed since it is a disharmonic coordination in the sense that one of the conjuncts is inverted, but the other is not. However, this argument lacks strength since that kind of coordination is actually possible:

(16) In that garden stands an elegant fountain, and an interesting dwarf dwells in that fountain.

Under the PP-subject hypothesis, however, (15b) is ill-formed because the first conjunct [*stands an elegant fountain*] is a simple VP while the second conjunct [*an interesting dwarf dwells* ___] is an S with a PP gap. It violates the general coordination principle because only one conjunct contains a gap.

3.2 Filler Properties of the Preverbal PP

Even though the preverbal PP in SI has a property of a subject (section 3.1) and cannot be long extracted (section 2.4), it also has a property of an extracted element, a topic or filler. Some pieces of evidence that the preverbal PP also functions as a filler as well as a subject arise from the following observations.

First, a filler property of the preverbal PP is provided by the fact that it carries background information to which information of a new participant is introduced by the postverbal NP. Cross linguistically, topicalization is a typical way of conveying background information.

Second, as observed by Kaisse 1985 and supported by Bresnan 1994, the preverbal PP in SI does not trigger the auxiliary reduction as shown in (17a), while the genuine PP subject in (17b) triggers it:

(17) a. *In San Jose's a great restaurant
b. Under the bed's a great place to hide a toy.

According to Kaisse 1985, the reduced clitic form of *is*, /z/, is possible only when the pre-clitic phrase is the subject, but not when it is a fronted element such as a topic or interrogative (e.g., *Who's the man looking for?*). Thus if we assume that the preverbal PP in SI functions as a topic, we can account for the ill-formedness of (17a).

Note that the PP in SI differs from the genuine PP subject in that the former does not trigger the subject-verb agreement and the subject-aux inversion as shown in (18a) and (19a), while the latter does, as shown in (18b) and (19b):

(18) a. Down through the hills and into the forest *flow/flows the little brook. (Levine 1989)
b. Under the bed and in the fireplace are/*is not the best combination of places to leave your toys. (Levine 1989)

(19) a. *Did into the room walk a woman?
b. Is under the bad a good place to hide a toy?

Third, the fillerhood of the postverbal PP is supported by the distribution of the complementizer. When SI or topicalization occurs in a complement clause of a bridge verb, the overt complementizer *that* must exist, as shown in (20) and (21):

(20) a. Mary said [that under the tree sat a woman].
b. *Mary said [under the tree sat Mary].

(21) a. Mary said [that the dog, the man kicked].
b. *Mary said [the dog, the man kicked].

The parallels in grammatical patterns between ordinary topicalization and SI shown above suggest that they should be viewed as instances of the same construction, namely, topicalization.[1]

3.3 Subject Properties of the Postverbal NP

Even though the preverbal PP has subject properties in some respects, as shown in section 3.1, it does not seem to have the full distribution of the typical subject. Kathol and Levine 1992 propose that the postverbal NP, rather than the preverbal PP, is the real subject.

First, pronouns usually do not occur as a postverbal NP in SI since they are not appropriate to bear presentational focus, yet they do occur in SI in some contexts. Kathol and Levine 1992 argue that when a pronoun is allowed in a postverbal position, nominative case is much preferred, as shown in (22):[2]

(22) Under the tree sat I/*me (waiting for my friends to appear).

Second, the subject-verb agreement shown in (23) also seems to show the subjecthood of the postvebal NP, i.e., the verb agrees with the postverbal NP, suggesting that even though the postverbal NP does not appear at the subject position in SI, it still plays the role of subject in the subject-verb agreement.

(23) a. Under the tree sits/*sit a woman.
b. Under the tree *sits/sit two women.

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[1] See Emonds 1976, Stowell 1981, Coopmans 1989, among others for the same proposal.

[2] However, case assignment may not be crucial evidence for the subjecthood of the postverbal NP, because some speakers actually prefer accusative case to nominative case. Moreover, in examples like (i), accusative case is suggested to be more natural than nominative case.

(i) a. Among the guests of honor was sitting HER [pointing]. (Bresnan 1994)
b. ?Into the room walked them all. (Rochemont and Culicover 1990)
c. ?*In the garden am I. (Green 1985)
d. In the garden is me. (Green 1985)

I do not presently have a clear account of this case alternation.

Third, let us consider the "Subject Gap in Finite clauses" (SGF) coordination construction, illustrated in (26), which is another argument against the subjecthood of the preverbal PP in Kathol and Levine 1992.

(24) Into the woods went the hunter and shot a hare.

The special property of SGF is that the second conjunct is controlled by the postverbal NP of the first conjunct, *the hunter*. Yet the preverbal PP of the first conjunct, *into the woods*, does not have scope over the second conjunct. If we consider SGF as an instance of an ordinary coordinate construction and that the preverbal PP is the subject, it is hard to account for the control and scope matters.

Fourth, the binding fact in (25b) also suggests that the postverbal NP is the subject since in the SI, it binds the anaphor *each other* within the preverbal PP:

(25) a. Two young boys$_i$ sat beside each other$_i$ quietly.
b. Beside each other$_i$ sat two young boys$_i$ quietly.

Fifth, the preverbal PP cannot be an understood subject of a non-finite VP complement as shown in (26b), which indirectly suggests that not the preverbal PP but the postverbal NP is the subject.

(26) a. *I expect into the room to walk a woman.
b. *I believed into the room to walk a woman.

4. A New Analysis

4.1 Dissociated Argument Realization and Multiple Inheritance Hierarchy

In order to provide an account of the mixed functional properties of the preverbal PP and the double subject properties (the subjecthood of both the preverbal PP and postverbal NP) in SI within the theory of Head-Driven Phrase Structure Grammar (HPSG hereafter), I propose the following lexeme specific constraint for SI verbs:[3] [4]

(27)
$$\textit{sty-inv-lxm} \Rightarrow \begin{bmatrix} \text{HEAD} \mid \text{IC} + \\ \text{SUBJ} \langle [2] \rangle \\ \text{COMPS} \langle [1] \rangle \\ \text{SLASH} \{[3]\} \\ \text{ARG-ST} \langle [1]\text{NP}, [2]\text{PP}[+\text{LOC}, \text{LOCAL}[3]] \rangle \end{bmatrix}$$

(27) states the following: (i) an SI verb has an NP and a locative PP as its arguments in that order, as represented by ARG-ST value; (ii) the first argument (NP) is realized as a complement, and the second argument (PP) is realized as a subject, as represented by COMPS and SUBJ values,

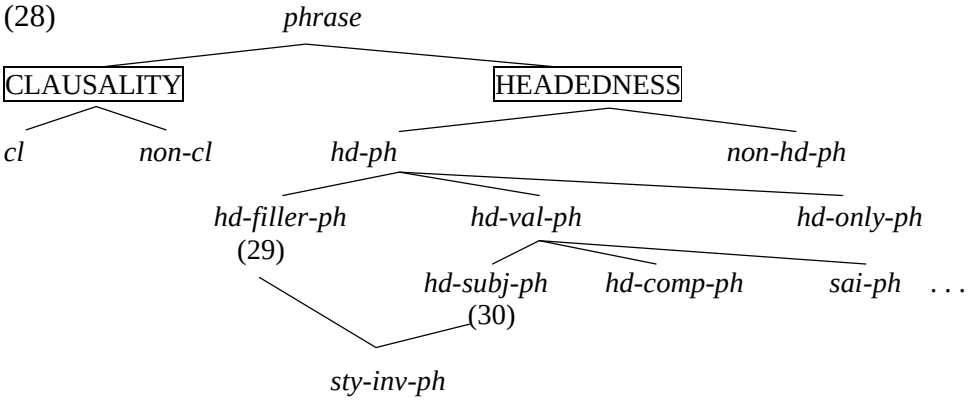
[3] The lexemic constraint in (27) overrides more general constraints such as the argument realization and SLASH amalgamation constraints.

[4] The idea of introducing the [IC +] feature into the lexeme constraint was suggested by Ivan Sag (in personal communication).

respectively; (iii) the LOCAL value of the PP is realized as a slash value, i.e., the subject PP also plays a filler role; and (iv) the SI lexeme's IC (Independent Clause) value is plus, i.e., the SI verb must be a head verb of a matrix clause. The dissociation between the argument structure and valence structure specified in (ii) has some independent motivations in the analyses of various ergative languages, as shown in Manning and Sag 1999. Also see Ginzburg and Sag 2001 for the motivation of introduction of the IC feature.

Following Sag 1997 and Ginzburg and Sag 2001, the present analysis assumes the multiple construction type inheritance hierarchy that is used to capture the fact that instances of some construction types seem to resist being uniquely categorized in a natural way. In my analysis, the preverbal PP has properties of both a filler and a subject, and the mixed functional properties can be captured naturally under the multiple inheritance approach. To this end, this paper proposes the multiple construction type inheritance hierarchy in (28), where the *sty(listic)-inv(ersion)-phrase* is a subtype of both the *h(ea)d-filler-phrase* and *h(ea)d-subj(ect)-phrase*.

(28)



According to Bouma et al 2001, the *hd-filler-ph* and *hd-subj-ph* in (28) have their own constraints in (29) and (30):

(29)

$$\textit{hd-filler-ph} \Rightarrow \begin{bmatrix} \text{HEAD } \textit{verb}\ [\text{VFORM } \textit{fin}] \\ \text{SUBJ } \langle\ \rangle \\ \text{SLASH } [2] \\ \text{HD-DTR } [\text{SLASH } \{[1]\} \uplus [2] \\ \text{NON-HD-DTR } \langle[\text{LOC } [1]\rangle \end{bmatrix}$$

(30)

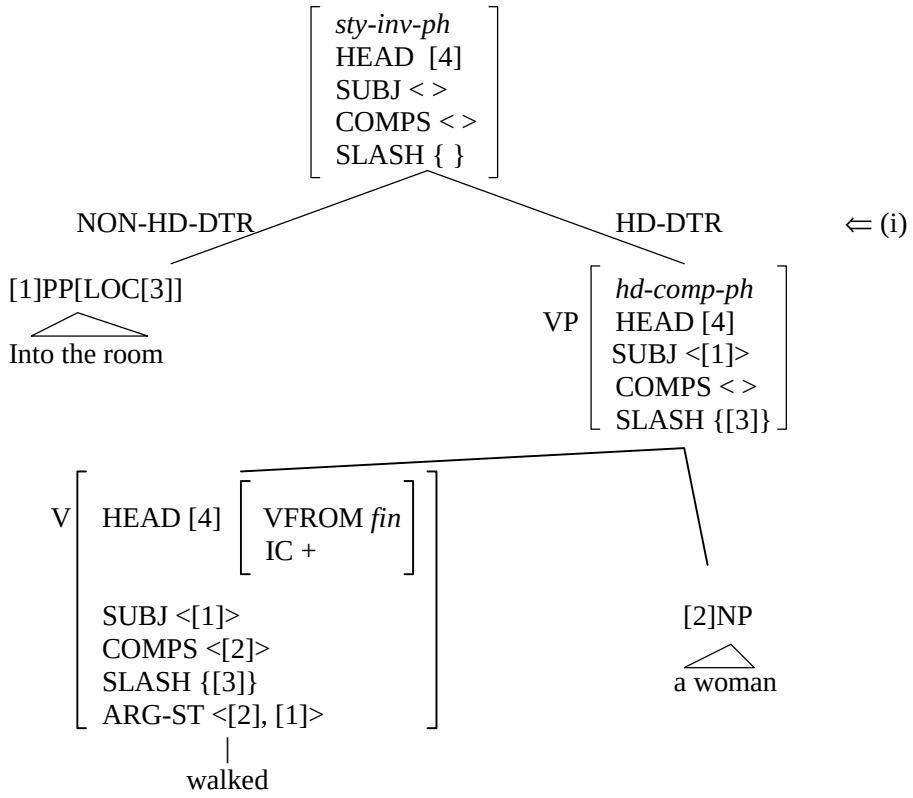
$$\textit{hd-subj-ph} \Rightarrow \begin{bmatrix} \text{SUBJ } \langle\ \rangle \\ \text{HD-DTR} \begin{bmatrix} \textit{phrase} \\ \text{SUBJ } \langle[1]\rangle \end{bmatrix} \\ \text{NON-HD-DTR } \langle[1]\rangle \end{bmatrix}$$

(29) states general constraints on a phrase consisting of a head daughter and filler daughter: (i) the gapped element in the head daughter is bound by the filler, i.e. SLASH {[1]} in the head is discharged (eliminated) when the non-head filler has the same LOCAL value; (ii) the head-filler phrase must already contain its subject, i.e., the filler combines with the head after the subject does, which is represented by the empty SUBJ list; and (iii) the head daughter's verb form must

be finite. (30) states general constraints on a phrase consisting of a head daughter and the subject daughter: the head's subject list is discharged and gets empty when the non-head daughter has the same synsem value as that of the SUBJ value of the head phrase.

In this analysis, the typical SI example in (1) is analyzed as in (31):

(31)



Here the lexical entry of *walked* is licensed by (27): the first element of the ARG-ST, [2], is realized as the complement, and the second, [1], as the subject. Its IC value is plus. The local tree in (i), licensed by the *sty-inv-ph*, simultaneously satisfies the constraints in (29) and (30). It satisfies (29) because the non-head daughter's local value is the same as that of the head daughter's SLASH value, and thus the mother's SLASH value {[3]} gets empty. The VFORM value is *finite*. It also satisfies (30) because the non-head daughter's synsem value, [1], is the same as the SUBJ value of head daughter, and thus the mother's SUBJ value gets empty.

4.2 Consequences

In this section, I will discuss how the examples given in previous sections are explained in my analysis. Let us consider the examples in section 3 first. Example (9) of amelioration of the WCO effect, example (14) of a tag question, and example (15) of coordination are accounted for by the assumption that the PP is the subject.

The contrast between (17a) and (17b) are accounted for since the PP is also the topic (or filler) and does not trigger the auxiliary reduction. The contrasts shown in (18) and (19) will be discussed shortly.

The contrast between (20a) and (20b) is accounted for by the constraint on complementizer

in (32) (Bouma et al. 2001 and Ginzburg and Sag 2001):

(32)
$$\left[\begin{array}{ll} \text{HEAD} & \left[\begin{array}{l} \textit{comp} \\ \text{IC} \quad - \\ \text{INF} \quad - \\ \text{MOOD} \quad [3] \\ \text{VFORM} \quad [2] \end{array}\right] \\ \text{SUBJ} < > & \\ \text{ARG-ST} & \left\langle \left[\begin{array}{l} \text{S} \\ \text{MOOD} \quad [3] \\ \text{INF} \quad - \\ \text{INV} \quad - \\ \text{VFORM} \quad [2] \\ \text{SUBJ} < > \end{array}\right] \right\rangle \end{array}\right]$$

Here the complementizer *that* itself is specified as [IC –] while the IC value of its complement is left unspecified. It allows "main clause phenomena" in an embedded clause only when *that* is present. That is, a *that*-less complement clause has [IC –] assigned by the governing verb. When the verb takes a CP as its complement, however, the embedded clause can have either [IC +] or [IC –] simply because its value is not specified. Then the *sty-inv-ph*'s constraint, [IC +], in (28) guarantees that the SI occurs in an embedded clause only when the complementizer *that* exists and the IC value of its complement is selected to be "plus."[5]

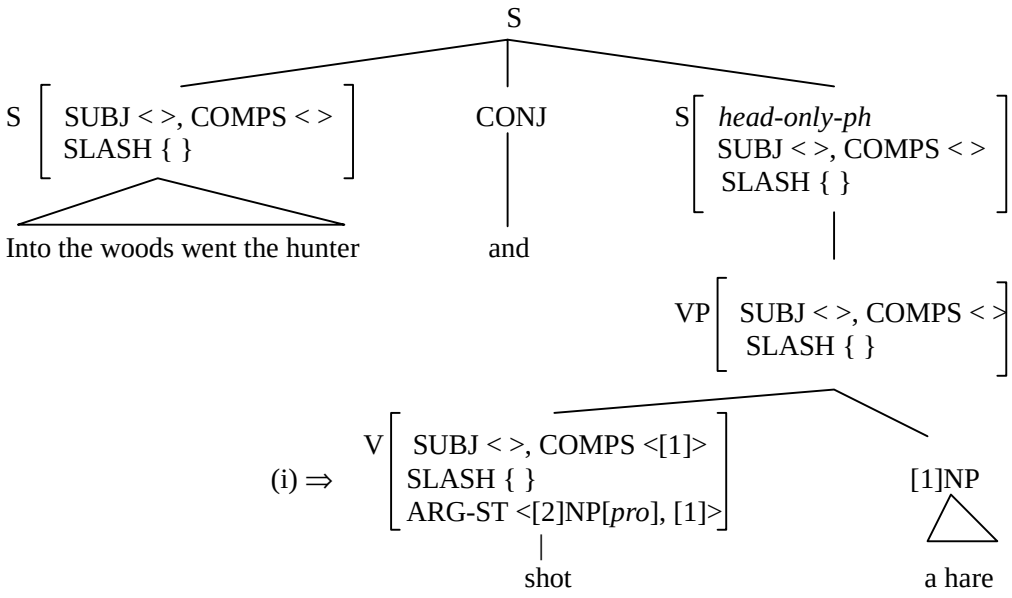
The nominative case assignment to the postverbal NP in (22) will be simply accounted for if we assume that case is assigned at the level of ARG-ST, following Przepiókowski 1998. In his case theory, nominative case is assigned to the first NP in the ARG-ST, and accusative case to the rest NPs. As shown in (27), in my analysis, the postverbal NP is still the first NP at the ARG-ST level even though it is a complement at the valence level. Thus nominative case is predicted to be assigned to the postverbal NP.

My analysis accounts for the subject-verb agreement facts in (23a,b) and (18b) if the agreement is considered to be triggered by the first element in the ARG-ST, rather than by the SUBJ element, as case is assigned at the ARG-ST level.

Presently I do not have a generalized theory of the SGF coordination in (24). However, I propose that it is an instance of a *pro*-drop phenomenon, i.e., the subject of the second conjunct is a *pro*. Following Manning and Sag 1999, the *pro*-drop phenomenon is accounted for by the dissociation between the ARG-ST value and the VALENCE value, i.e., as shown in (i) in (33) below, the ARG-ST list of the verb *shot* has an NP[*pro*] as its first element, but the *pro* is not realized in the SUBJ list, and thus the verb has an empty SUBJ list:

[5] Note that the complement clause of the complementizer *that* has [INV −] in (32), which is specified so in order to account for the lack of subject-aux-inversion in an embedded clause. It does not cause any problem in my analysis of SI because the INV feature itself is not required at all.

(33)



In (33), the [2]NP[*pro*] is bound by the most salient element of the first conjunct, namely the first ARG-ST element (*the hunter*) of the verb *went*. Also note that in this analysis, each conjunct's SUBJ and SLASH values are all empty, and thus that the coordination principle is not violated.

It is controversial whether English has a *pro*-drop phenomenon in a finite clause. However, examples such as (34) and (35) suggest that *pro* occurs in English at least in some limited contexts.

(34) A: What did the boy do?
B: (*pro*) Kicked the can over the fence.

(35) A: "He was a great guy."
B: "You said "was." Does that mean—?"
He nodded.
A: "(*pro*) Died a couple weeks ago." (Foster Furcolo's *The Letter*)

The anaphor binding fact in (25) is explained because binding is generally assumed to occur at the level of ARG-ST (Manning and Sag 1999). The postverbal NP is less oblique than the preverbal PP at the ARG-ST, and thus the former can bind the latter.

My analysis does not allow (26), where the preverbal PP *under the tree* is the understood subject of a VP complement because it violates the lexemic constraint in (27): the SI verb *walk* must have [IC +]. In (26), however, the VP *walk a woman* is selected by the auxiliary verb *to*, and the head of the VP *walk* has [IC –]. The ungrammaticalities of the examples of freezing effect in (8c), of long extraction in (11a), and of raising in (13a) are all explained by the constraint on [IC +]. Here the SI verbs such as *sit* and *walk* are selected by auxiliary verbs such as *did* and *to*, and the SI verbs have [IC –], violating constraint (27).

We may think that the constraint on [IC +] can be substituted by a constraint on finiteness because most of the examples violating the [IC +] constraint have non-finite SI verbs (e.g., (8c), (11a), (13a) and (26)). However, the constraint on [IC +] provides a more general explanation than that on finiteness, in a sense that the former accounts for the finite example in (20b) as well

as the non-finite examples. Another example showing the superiority of the [IC +] constraint is (12a). In my analysis, (12a) is not allowed because the finite clause with a PP gap subject, [___ *walked Robin*], is selected by the matrix verbs, *claim* or *believe*, and the clause should have [IC –]. The IC feature is a head feature, and thus the IC value of the head of the clause, *walked*, has to be minus, violating constraint (27). The finiteness constraint does not account for this example.

Then let us consider the examples in section 2. In my analysis, the freezing effect in (8) is explained by syntactic and discourse factors. Let us discuss the syntactic ones first. As already shown above, the subject-aux inversion in (8c) (or (19a)) is not allowed due to the [IC +] constraint. (8d) is also not allowed under the PP-subject hypothesis because generally nothing can be extracted out of a subject. (Huang's 1982 Conditions on Extraction Domain).

As for (8a,b), the postverbal NP is a complement at the valence level, and thus there is no reason why it cannot be *wh*-extracted or topicalized at least at the level of syntax. However, the ill-formedness of (8a) seems to arise from a discourse factor. According to Rochemont 1986, the SI is one of the structural focus constructions where focus lies on the postverbal NP. Similarly, Green 1985 and Bresnan 1994 propose that in the SI, the preverbal PP provides background information, while the postverbal NP introduces a new participant to the established background. In this approach, the postverbal NP cannot be replaced by a *wh*-phrase because it is not appropriate to introduce a new participant by a *wh*-phrase.

We may assume that the ill-formedness of (8b) is also due to the NP's conflict in discourse functions, i.e., the NP is inherently focused but also topicalized. It may cause a conflict in the value of the information structure in terms of Engdahl and Vallduví 1996: FOCUS vs. LINK. However, Elisabet Engdahl (in personal communication) pointed out that this account lacks strength when we consider Ward's 1988 observation that in English the focused element (e.g., an interrogative phrase) can also be preposed to the beginning of a sentence. Thus we cannot say that preposing of the postverbal NP itself causes the ill-formedness of (8b). The real reason of the ill-formedness seems due to multiple topicalization with wrong linear order. In English, the multiple topicalization is generally not good as shown in (36):

(36) ?And this book, to whom should Bill give? (Watanabe 1993)

Moreover, in my analysis, the preverbal PP is a topic with background information. Then (8b) is ill-formed because it has two preposed elements in the order of focus (NP) and topic (PP), violating the general liner order constraint—topic precedes focus—in addition to the awkwardness of multiple topicalization. The contrast between (36) and (37) shows that the order of topic and focus among the fronted elements affects the well-formedness:

(37) *To whom, this book should Bill give? (Watanabe 1993)

Finally let us consider the examples showing contrasts between light inversion (LI) and heavy inversion (HI). (10a) is blocked due to the constraint on the ARG-ST in (27), i.e., the locative PP should be included in the ARG-ST since it is an argument rather than an adjunct. It has the effect of preventing an unergative verb like *sleep* in (10) from licensing LI (SI in this paper). That is, the PP *in the room* in (10) is not an argument but an adjunct, so *sleep* cannot be an instance of the SI lexeme. The examples in (11a), (12a) and (13a) are blocked by the constraint on [IC +] as already discussed above.

4.3 More Consequences

There are some more examples that my analysis correctly predicts. First, this paper considers the postverbal NP to be a complement (direct object) at the valence level. This analysis predicts the grammaticality in (38) because no adverbs or parentheticals can intervene between a verb and its direct object.

(38) a. Into the room strode Robin boldly.
b. *Into the room strode boldly Robin. (Kathol and Levine 1992)

Second, my lexical approach can account for the contrast between (39b) and (39c):

(39) a. Robin walked [to the bridge over the river].
b. *Over the river walked Robin [to the bridge ___].
c. [To the bridge over the river] walked Robin.

In my analysis, as shown in (27), it is lexically specified that the PP *to the bridge over the river* should become a subject as a whole in SI. That is, SI is possible only when the verb has a PP argument, which is realized as the subject as a whole. Thus in SI, *over the river* cannot become a subject separately from *to the bridge*. In a transformational approach, however, it is not clear how this contrast is explained because there is no way of preventing a subpart PP (*over the river*) from licensing SI. It may be argued that (39b) is ill-formed because *over the river* cannot be extracted out of an NP *the bridge over the river*. However, such extraction is actually possible as shown in (40):

(40) This is the river [over which]$_i$ I have to find a bridge ___$_i$.

Third, according to Coopmans 1986, auxiliaries are not generally allowed in SI as shown in (41):

(41) a. *Down the hill may roll the ball.
b. *Out of the house was strolling Robin.
c. *On that table has been put a book.

My analysis correctly predicts this fact because all the SI verbs governed by auxiliaries violate the constraint on [IC +]. However, Coopmans 1986 states that the passive *be* without any other preceding auxiliary is generally allowed as shown in (42) (cf. (41c)):

(42) On that table was put a valuable book.

(42) may be considered to be a counterexample to my analysis because it also violates the constraint on [IC +] and predicted to be ill-formed. However, it is not a real counterexample because (42) is not a genuine example of SI but an example of heavy inversion. When the postverbal NP becomes light as shown in (43), the sentence becomes much worse:

(43) *$^{/??}$On the table was put a book (carefully).

5 Conclusion

In the English SI construction, the preverbal PP and postverbal NP have mixed functional properties. This paper presents a way of dealing with mixed functional properties in HPSG. These mixed properties are directly explained through two general constraints on ordinary clause formations, 'subject + VP' and 'filler + S'. Those two constraints are simultaneously inherited by the SI construction by the multiple inheritance hierarchy. This analysis views SI as an instance of the peripheral phenomena whose construction-specific constraints are inherited from more general core constraints.

This analysis also suggests that it may be pointless to argue about which argument is the real subject in the SI since both the PP and the NP have the properties of the subject, i.e., the PP is the subject at the valence structure level, whereas the NP is the subject at the argument structure level. This "double" subject analysis is possible due to the notion of dissociation between the argument and valence structures.

My proposal of the dual function PP is similar to Stowell 1981 and Bresnan 1994. In Stowell 1981, the preverbal PP in SI moves to the subject position and sequentially to the COMP position leaving a trace at the subject position. In Bresnan 1994, the preverbal PP is a topic in the c-structure, but it is "interpreted" as indirectly filling the subject position in the f-structure by means of topicalization.

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