Toward a Unified Constraint-Based Analysis of English Object Extraposition

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Sae-Youn Cho. 2010. Toward a Unified Constraint-Based Analysis of English Object Extraposition. *Language and Information 14.1*, 49–65. It has been widely accepted that English object extraposition can be easily accounted for. However, recent research exhibits the fact that various cases of English object extraposition lead to many empirical and theoretical problems in generative grammar. To account for such cases, the previous lexical constraint-based analyses including Kim & Sag (2006, 2007) and Kim (2008) attempt to give an explanation on the phenomenon. They, however, seem to be unsuccessful in providing an appropriate analysis of object extraposition, mainly due to the mistaken data generalizations. Unlike the previous analyses, we claim that all verbs selecting CP objects allow object extraposition and propose a unified constraint-based analysis for the various cases of the construction. Further, it is shown that as a consequence, this analysis of object extraposition can be naturally extended to subject extraposition. Hence, this unified analysis enables us to further suggest that all verbs selecting CP allow subject and object extraposition in English. (**Kangwon National University**)

1. Introduction

It is well-known that English allows an extraposition construction where a finite clause occurs in the sentence-final position, leaving the expletive *it* in the original position of the clause instead. As shown in (1) and (2), the extraposition construction can be classified into two kinds with respect to the position of occurring the expletive *it*: subject extraposition and object extraposition.

(1) *It* bothers me [that Johnny speaks loudly].

(2) They never mentioned *it* to the candidate [that the job was poorly paid].

It has been widely accepted that this extraposition phenomenon can be easily accounted for without any difficulty. However, various research studies have recently suggested that previous analyses of object extraposition are neither theoretically nor empirically satisfactory.

Theoretically, the expletive pronoun *it* with no semantic content in English object extraposition causes theoretical problems especially within main stream generative grammar.[1] Specifically, though the Projection Principle proposed by Chomsky (1981) predicts that expletives cannot appear in any theta-position, it is a fact that the dummy *it* can occur in the strictly subcategorized object position of English object extraposition as in (2) (Cf. Postal & Pullum (1988)).[2]

Empirically, there are lots of disagreements on the grammaticality of English object extraposition construction. Kim & Sag (2006, 2007) provide three different types of object extraposition with respect to the occurrence of the expletive *it*: the expletive *it* in object position is obligatory in Group I, optional in Group II, and of questionable status in Group III, as in (3).

(3) Group I: I blame *(it) on you [that we can't go].
    Group II: Nobody expected (it) of you [that you could be so cruel].
    Group III: John thought (?it) to himself [that we had betrayed him].

In explaining the three Groups, Kim & Sag (2006, 2007) regard the data in Group III as grammatical sentences on the basis of the attested data found on the Internet. On the contrary, Kim (2008) assumes that the sentences in Group III are all ungrammatical, following Bolinger's (1977) grammatical judgments. Further, assuming that (4a) is grammatical whereas (4b) is not, Kim speculates that some transitive verbs selecting an NP object may undergo object extraposition. However, the grammaticality of the sentences in (4), which Kim & Sag (2006, 2007) do not analyze in detail, is also of questionable status.

(4) a. I just love it that you are moving in with us.

     b. *I just love that you are moving in with us.

Such disagreement on grammaticality also prevents us from giving a neat explanation on object extraposition.

Hence, the following questions should be answered to analyze English object extraposition appropriately:

(5) a. How many object extraposition rules do we need?

     b. Is it possible to posit a unified rule for English object extraposition?

     c. Is it (or Are they) optional or obligatory?

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[1] The issue on whether the pronoun *it* has no semantic content at all is beyond the scope of this paper. For further discussions on this issue, refer to Bolinger (1977).

[2] To hold the Projection Principle, various attempts such as Rothstein (1995) and Stroik (1996) have been made within the main stream generative grammar. Since we focus on constraint-based analyses of English object extraposition, we deliberately omit discussions on such attempts in this paper (Cf. Kim & Sag (2006)).

      d. Do we really have more than three different cases of English object
         extraposition?

      e. Is object extraposition wholly different from subject extraposition? Or
         do they basically belong to the same phenomenon?

To answer the questions above, we will reexamine the so-called three cases of object
extraposition by Kim & Sag (2006, 2007) as well as the additional object extrapo-
sition data by Kim (2008) and then show that some grammatical judgments are
not reliable.[3] Rather, given an appropriate context or a special stress to the con-
troversial data, most of the data in question can be construed to be grammatical
by many native speakers. This will enable us to get rid of the unnecessary lexical
Groups of object extraposition with respect to the occurrence of *it*. On the basis
of newly observed data generalizations, we claim that all predicates requiring CP
objects allow object extraposition in principle. To support this claim, we propose
an optional object extraposition rule in Head-driven Phrase Structure Grammar
(HPSG), which can cover the additional cases of object extraposition dealt with by
Kim (2008). Further, we suggest that Kim & Sag's three different cases and Kim's
additional cases of object extraposition can be accounted for by a unified optional
rule and slightly modified LP rules. Consequently, the newly proposed analysis of
object extraposition based on the claim we made here can naturally extend to the
analysis of subject extraposition in the sense that all verbs selecting CP subject or
object allow extraposition.

    The organization of this paper is as follows: The previous analyses of object
extraposition in HPSG are introduced in section 2. In so doing, we pinpoint theo-
retical shortcomings of the previous analyses and stress which data is controversial
on grammaticality. After critically reviewing the previous analyses, we revisit the
controversial data at issue and then draw new data generalizations on the basis of
native speakers' grammatical judgments. Based on the data generalizations, section
3 provides a unified analysis of object extraposition in HPSG and shows how it can
account for the phenomenon. We conclude this paper with the consequences of this
theory.

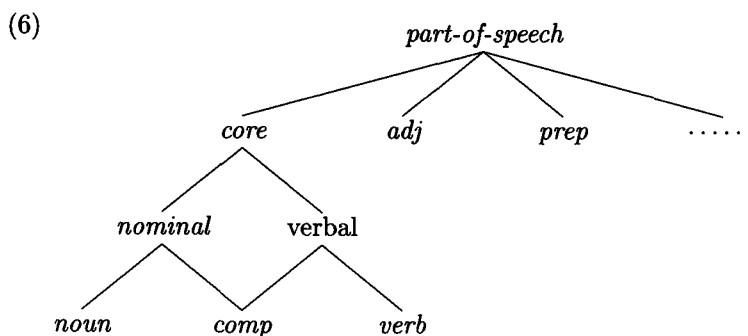## 2. Previous Analyses of Object Extraposition in HPSG

2.1 Kim & Sag (2006, 2007)
Assuming that there are three different Groups of object extraposition in English
as shown in (3), Kim & Sag (2006, 2007) attempt to give an explanation of the
extraposition data under the lexical, constraint-based analysis. In doing so, they
mainly focus on why some verbs allowing object extraposition seem to strongly
require the expletive *it* on object position while other verbs do not appear to
require it in that position.

    To account for the three Groups of object extraposition, following much work
in current HPSG (cf. Pollard & Sag (1994), Kim & Sells (2008)), they assume that
parts of speech can constitute the hierarchy as illustrated in (6):

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[3] We thank Brian Fair, Wendy Harrell, John Gorman, Robert Gates, and Ryan Freer for providing
  grammatical judgments on the data in this paper.

(6)

```
                          part-of-speech
                   _____/_____
                  /          |       |      \
               core         adj     prep    ......
             __/\__
            /      \
        nominal   verbal
        _/\_      _/\_
       /    \    /    \
     noun  comp      verb
```

Kim and Sag (2007; 3)

Given the above hierarchy of parts of speech, the subcategorization (SUBCAT) information of English predicates can be effectively specified. For example, the strict transitive verb *pinch* requires NP object while the predicate *prove* subcategorizes for either the CP or NP object, as shown in (7) – (8).

(7)   a. She pinched [his arm] as hard as she could.

     b. *She pinched [that he feels pain].

(8)   a. Cohen proved [the independence of the continuum hypothesis].

     b. Cohen proved [that the continuum hypothesis was independent].

Kim & Sells (2008; 94)

To express the difference of the SUBCAT information between the two verbs, we can provide the lexical information (9) for the verb *pinch*, and (10), for the verb *prove*.

(9) pinch: $\left[\text{SUBCAT} \ \left\langle \text{NP, NP}\big[\text{HEAD} \ \textit{noun}\big], ... \right\rangle \right]$

(10) prove: $\left[\text{SUBCAT} \ \left\langle \text{NP}, \big[\text{HEAD} \ \textit{nominal}\big], ... \right\rangle \right]$

Kim & Sells (2008; 94)

In (10), [HEAD *nominal* can be realized as either [HEAD *noun*], i.e. NP, or [HEAD *comp*], i.e. CP. This method could be quite economical in specifying various lexical information in HPSG.

     To analyze object extraposition construction, following Bouma (1996), they adopt the non-local feature EXTRA together with the following lexical construction:

(11) Extraposition Construction

$$
\begin{bmatrix}
\text{MTR} & \begin{bmatrix} \text{PHON}\boxed{0} \\ \text{S} \mid \text{C} \quad \begin{bmatrix} \text{SUBCAT} & \boxed{A}\oplus\big\langle \text{NP}[it] \big\rangle\oplus\boxed{B} \\ \text{EXTRA} & \big\langle \boxed{1} \big\rangle \end{bmatrix} \end{bmatrix} \\
\text{DTRS} & \Big\langle \begin{bmatrix} \text{PHON}\boxed{0} \\ \text{S} \mid \text{C} \mid \text{SUBCAT} \quad \boxed{A}\oplus\big\langle \boxed{1}[verbal] \big\rangle\oplus\boxed{B} \end{bmatrix} \Big\rangle
\end{bmatrix}
$$

Kim and Sag (2007; 6)

This lexical rule enables us to ensure that if there is a verb requiring CP or VP[*infinitive*] object, the verb may either have a CP or VP[*infinitive*] object in its sentence or can have the expletive *it* on object position and the CP or VP[*infinitive*] in the extraposition slot.[4] Once the verb takes the expletive *it* in the object position and the CP or VP[*infinitive*] in the extraposition slot, the extraposed CP or VP[*infinitive*] will be passed up to a higher structure and discharged in terms of the Head-Extraposition Construction in (12).[5]

(12) Head-Extraposition Construction

$$
\begin{bmatrix}
\text{MTR} & \begin{bmatrix} \text{S} \mid \text{C} \mid \text{EXTRA} \big\langle \big\rangle \end{bmatrix} \\
\text{DTRS} & \big\langle \boxed{0}, \boxed{1} \big\rangle \\
\text{H-DTR} & \boxed{0} \begin{bmatrix} \text{S} \mid \text{C} \begin{bmatrix} \text{SUBCAT} \big\langle (\text{X}) \big\rangle \text{EXTRA} \big\langle \boxed{1} \big\rangle \end{bmatrix} \end{bmatrix}
\end{bmatrix}
$$

Kim and Sag (2007; 6)

In addition to these tools, they introduce the three English Linear Precedence (LP) Constraints in(13), which are already employed in current HPSG, to get the right word order for English sentences and then propose a new LP constraint for object extraposition as shown in (14):

(13) English Linear Precedence Constraints

LP1: Hd-Dtr $\begin{bmatrix} word \end{bmatrix} \prec$ X

LP2: $\boxed{1} \prec \begin{bmatrix} \text{SYN} \mid \text{CAT} \mid \text{SUBCAT} \big\langle \boxed{1} \big\rangle \end{bmatrix}$

LP3: NP $\prec$ PP

(14) LP4: Complement $\prec \begin{bmatrix} \text{SYN} \mid \text{CAT} \mid \text{HEAD} \ verbal \end{bmatrix}$

Kim and Sag (2007; 4–5)

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[4] For further discussions on (11), refer to Kim & Sag (2007).

[5] An anonymous reviewer suggested to check whether object extraposition construction can undergo passivization. Though it seems to be meaningful, we leave this for further research.

For your readability, LP1 requires that a lexical head should precede its sisters while LP2 guarantees that a predicative category selecting its subject follows that subject. In other words, LP2 constraint can be understood as an LP constraint saying that a controller must precede its controlled predicative category. In turn, LP3 ensures that an NP complement must precede its PP sisters. Finally, the newly proposed LP4 means that a CP or VP[*infinitive*] should follow any other complement sisters. In fact, the LP4 constraint is posited on the basis of the so-called BNFC (Ban on Non-sentence Final Clause) constraint like (15) by Kuno (1987).

> (15) **The BNFC Constraint**
>   No element can follow after a clausal element (CP or S).
>
>   Kim (2008)

So far, we have introduced the Lexical Extraposition Construction rule, Head-Extraposition Construction schema, and the four LP constraints proposed by Kim & Sag (2006, 2007). From now on, we review how their lexical, constraint-based analysis can account for the three different cases of object extraposition in (3) with the theoretical tools above.

The first Group we have to consider is obligatory cases. Verbs like *blame* belong to obligatory cases because they seem to require the presence of the expletive *it* in the object position:

> (16) a. I blame [the case] on you.
>
>   b. *I blame [that we can't go].
>
>   c. *I blame [that we can't go] on you.
>
>   d. I blame it on you [that we can't go].
>
>   e. *I blame on you [that we can't go].
>
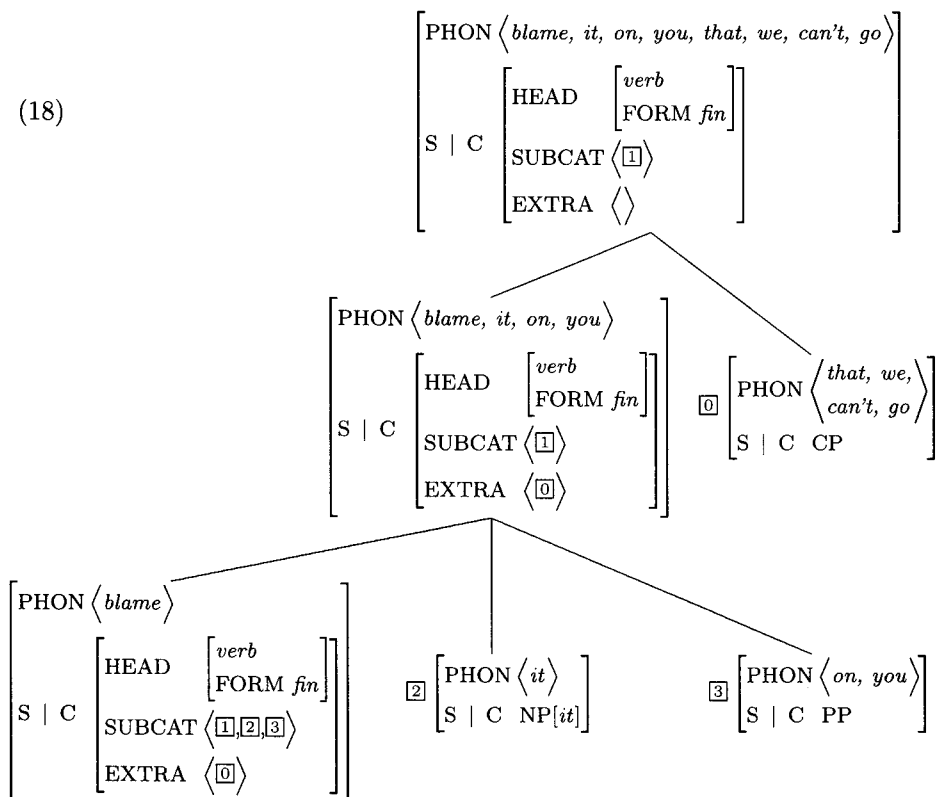>   Kim and Sag (2007; 8)

From the data observation, we can say that the verb *blame* will have the following SUBCAT information:

> (17) blame: $\left[\text{S} \,|\, \text{C} \,|\, \text{SUBCAT} \left\langle \boxed{1}\text{NP}, \boxed{2}\!\left[\text{HEAD } nominal\right], \boxed{3}\text{NP}\!\left[on, +\text{PRD}\right] \right\rangle \right]^6$

In (17), since the value for the object headed by the verb *blame* is *nominal*, the object can be realized either as NP or CP by the definition of the hierarchy in (6). When the object is resolved to NP, we may have sentences like (16a). However, when the object is realized as CP, (16b) is impossible because there is no PP complement

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[6] Following Kim & Sag (2007), we assume here that the nominal expression, $\boxed{2}$[HEAD *nominal*], is the controller of the predicative category, $\boxed{3}$NP[*on*, +PRD], in the SUBCAT list. For the discussions on the distinction between predicative and non-predictive phrases, refer to Kim & Sag (2007).

in its sentence. The CP-PP ordering in (16c) is ungrammatical in terms of LP4. Similarly, PP-CP ordering in (16e) is also ruled out since it violates LP2. As for (16d), the sentence can be predicted to be grammatical in that if the object is resolved to CP and then it must get pumped by the Extraposition Construction, we can get (16d), as illustrated in (18).

(18)

$$
\begin{bmatrix}
\text{PHON} \langle blame,\ it,\ on,\ you,\ that,\ we,\ can't,\ go \rangle \\
\text{S | C}
\begin{bmatrix}
\text{HEAD} \begin{bmatrix} verb \\ \text{FORM } fin \end{bmatrix} \\
\text{SUBCAT} \langle \boxed{1} \rangle \\
\text{EXTRA} \langle \rangle
\end{bmatrix}
\end{bmatrix}
$$

$$
\begin{bmatrix}
\text{PHON} \langle blame,\ it,\ on,\ you \rangle \\
\text{S | C}
\begin{bmatrix}
\text{HEAD} \begin{bmatrix} verb \\ \text{FORM } fin \end{bmatrix} \\
\text{SUBCAT} \langle \boxed{1} \rangle \\
\text{EXTRA} \langle \boxed{0} \rangle
\end{bmatrix}
\end{bmatrix}
\qquad
\boxed{0}
\begin{bmatrix}
\text{PHON} \langle that,\ we,\ can't,\ go \rangle \\
\text{S | C CP}
\end{bmatrix}
$$

$$
\begin{bmatrix}
\text{PHON} \langle blame \rangle \\
\text{S | C}
\begin{bmatrix}
\text{HEAD} \begin{bmatrix} verb \\ \text{FORM } fin \end{bmatrix} \\
\text{SUBCAT} \langle \boxed{1},\boxed{2},\boxed{3} \rangle \\
\text{EXTRA} \langle \boxed{0} \rangle
\end{bmatrix}
\end{bmatrix}
\qquad
\boxed{2}
\begin{bmatrix}
\text{PHON} \langle it \rangle \\
\text{S | C NP}[it]
\end{bmatrix}
\qquad
\boxed{3}
\begin{bmatrix}
\text{PHON} \langle on,\ you \rangle \\
\text{S | C PP}
\end{bmatrix}
$$

The second Group contains optional cases. The verb *expect* belongs with optional cases since the expletive *it* is in the object position headed by the verb and appears to be optional as illustrated by the following data set:

(19)   a. Nobody expected [his success].

b. Nobody expected [anything] of me.

c. Nobody expected [(that) you could be so cruel].

d. *Nobody expected [(that) you could be so cruel] of you.

e. Nobody expected it of you [(that) you could be so cruel].

f. Nobody expected of you [(that) you could be so cruel].

Kim and Sag (2007; 10)

From the data observation in (19), we can say that the verb *expect* requires an optional non-predicative PP and NP or CP or S object as complements. This SUBCAT information can be specified as follows:

(20) expect: $\left[\text{S} \mid \text{C} \mid \text{SUBCAT} \left\langle \boxed{1}\text{NP}, \boxed{2}[\text{HEAD } core], (\boxed{3}\text{NP}[of, \text{-PRD}]) \right\rangle \right]$

Under Kim & Sag's (2006, 2007) analysis, when the object of the verb is resolved to NP, both (19a) and (19b) are all possible. When the object of the verb is resolved to CP or S, (19c) is allowed only if the optional PP is not realized. In turn, sentence (19f) is allowed since the PP[-PRD]-CP ordering keeps all LP constraints whereas (19d) is disallowed because the CP-PP[-PRD] sequence violates the LP4 constraint. Finally, sentence (19e), where the CP or S object headed by *expect* is extraposed to the sentence-final position and the expletive *it* occurs in the object position, is possible because there is no LP violation.

The third Group contains cases of questionable status where Group III verbs such as *think* do not seem to allow object extraposition:

(21) a. *John thought the problem.

  b. He didn't think to find him in the kitchen.

  c. Everyone thinks that they're going to get their lyrics.

  d. John thought to himself that Mary was coming.

  e. ?John thought it to himself that Mary was coming.
$$\text{Kim and Sag (2007; 12)}$$

Based on the data observation in (21), we can provide the SUBCAT information in (22) for Group III verbs.

(22) think: $\left[\text{S} \mid \text{C} \mid \text{SUBCAT} \left\langle \boxed{1}\text{NP}, \boxed{2}[\text{HEAD } verbal], (\boxed{3}\text{NP}[to, \text{-PRD}]) \right\rangle \right]$

Sentence (21a) is impossible since the object of the predicate can be realized either as CP or VP[*infinitive*], whereas (21b-d) are possible, provided there is any violation of the LP constraints. Moreover, they argue that (21e) undergoing object extraposition should be regarded as a grammatical sentence on the basis of the following evidence found on the Internet:

(23) ...and I think it's great when Nessa says (**or maybe she just thinks it to herself**) that Eyvind, unlike Somerled, is wise.   Kim & Sag (2006)

If the parenthetical part is construed to be grammatical, Group III data like (21e) could be regarded as a subset of Group II data. If so, in terms of the Extraposition Construction, the expletive *it* and the CP object in (21e) can occur in the object position and in the sentence-final position, respectively. Hence, (21e) is predicted to be grammatical since the PP[-PRD]-CP sequence does keep the LP4 constraint.

2.2 Kim (2008)

Though Kim (2008) adopts the same lexical, constraint-based analysis by Kim & Sag (2006, 2007) in explaining Group I and Group II data, he rejects Kim & Sag's (2006, 2007) idea that (21e) is grammatical so that Group II and III data can be analyzed in a similar way. More specifically, Kim (2008) proposes the English Object Extraposition Rule in (24) to give an explanation of Group I and II data.

(24) English Object Extraposition Rule (Second Approximation)

> Verbs selecting a *nominal* can undergo *it* object extraposition. The placement of *it* is optional if the post-expletive phrase is non-predicative.

Kim (2008; 127)

As shown in (24), there is only a slight difference between Kim (2008) and Kim & Sag (2006, 2007) in analyzing the cases of Group I and II in that Kim (2008) speculates that the possible set of verbs allowing object extraposition is reduced to that of predicates whose object is [HEAD *nominal*] (cf. Authier (1991)). Contrary to Kim & Sag (2006, 2007), Kim (2008) regards such cases of Group III as *think*-verb in (21e) as ill-formed, as shown in (25) - (26).

(25) a. John thought to himself that Mary was coming.

b. John said to his friends that we had betrayed him.

(26) a. *John thought it to himself that Mary was coming.

b. *John said it to his friends that we had betrayed him.

Adopting Bolinger's (1977) grammatical judgments, he suggests that cases of Group III are impossible rather than of questionable status.

In addition, Kim (2008) provides some more additional cases of object extraposition:

(27) a. John kicked the ball.

b. *John kicked that the ball flew away

c. *John kicked it that the ball flew away.

(28) a. I just love you.

b. *I just love that you are moving in with us.

c. I just love it that you are moving in with us.

Kim (2008; 129)

In comparing the verb *kick* in (27) with the verb *love* in (28), Kim (2008) raises a question on why the latter allows object extraposition as in (28c) whereas the former disallows it as in (27c), though both verbs appear to select only entity-type NP object. In short, as Kim & Sag (2006, 2007) have suggested, he proposes another lexical rule of object extraposition only for *love*-type verbs as follows:

$$(29) \quad \begin{bmatrix} \langle \text{love} \rangle \\ \text{ARG-ST} \quad \langle \text{NP, NP} \rangle \end{bmatrix} \rightarrow \begin{bmatrix} \langle \text{love} \rangle \\ \text{ARG-ST} \quad \langle \text{NP, NP}_i \begin{bmatrix} \text{NFORM} & it \end{bmatrix}, \text{CP}_i \rangle \end{bmatrix}$$

Kim (2008; 129)

To distinguish *kick*-type verbs from *love*-type verbs, the previous analyses should specify which transitive verbs belong to which type in the lexicon.

2.3 Controversial Data at Issue and Theoretical Demerits of Previous Analyses

We have reviewed how the previous lexical constraint-based analyses attempt to solve English object extraposition so far. Throughout the review, we could observe some theoretical demerits and controversial data related to object extraposition. To clarify the characteristics of object extraposition, we revisit the controversial data native speakers pointed out first and then pinpoint the demerits of the previous analyses in the rest of this section.

One of the main difficulties in providing a neat explanation of object extraposition is that there is a lot of controversial data involving extraposition which find it hard to decide whether given sentences are grammatical or not. The first case is the verb *blame* which belongs to Group I. Specifically, most native speakers tend to regard (16c) as acceptable contrary to Kim & Sag's (2006, 2007) judgment, though they agree on the given grammatical judgments for the other sentences in (16).[7]

(16) a. I blame [the case] on you.

b. *I blame [that we can't go].

c. *I blame [that we can't go] on you.

d. I blame it on you [that we can't go].

e. *I blame on you [that we can't go].

Kim and Sag (2007; 8)

According to English native speakers regardless of nationality, (16c) becomes much better in grammaticality if the CP-PP[+PRD] sequence in its sentence receives a special stress. Unlike (16c), (19d) sounds bad though a special stress is assigned to the CP-PP[-PRD] sequence headed by *expect*, a case of Group II.

(19) d. *Nobody expected [(that) you could be so cruel] of you.

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[7] As for the first controversial cases, 4 among the 5 native speakers we mentioned above regard (16c) as acceptable while they disallow (19d).

The sharp grammatical contrast between (16c) and (19d) enables us to suggest that the CP-PP[+PRD] sequence in (16c) can be considered to be well-formed. If it is so, the previous analyses must answer how (16c) can be allowed under their analyses.

Secondly, Kim & Sag (2006, 2007) consider (21e) to be grammatical but following Bolinger (1977), Kim (2008) rejects Kim & Sag's grammatical judgment as shown in (26).

(21) e. ?John thought it to himself that Mary was coming.

(26) a. *John thought it to himself that Mary was coming.

     b. *John said it to his friends that we had betrayed him.

We believe that following Kim & Sag (2006, 2007), sentence (21e) as a subtype of Group III can be regarded as a grammatical sentence in that it can be a sort of attested example found on the Internet as in (23).

(23) ...and I think it's great when Nessa says (**or maybe she just thinks it to herself**) that Eyvind, unlike Somerled, is wise.

<div align="right">Kim and Sag (2007; 12)</div>

If it is grammatical, Kim (2008) need to answer how his theory treats this pattern.

The final cases of controversial data are related to *kick*-type and *love*-type verbs. As mentioned above, Kim (2008) assumes both (27b) and (28b), where the object is resolved to CP, to be ungrammatical.

(27) b. *John kicked that the ball flew away

(28) b. *I just love that you are moving in with us.

Again, most native speakers point out that (27b) is ungrammatical but (28b) is fully acceptable.[8] Especially in colloquial dialogues, sentences like (28b) can be freely pronounced. If it is so, the lexical rule in (29) only for *love*-type verbs should be unnecessary.

Close examination of the controversial data involving object extraposition reveals the following facts:

(30) Findings from the Controversial Data

     a. Group I (obligatory cases) and Group II (optional cases) similarly behave in undergoing object extraposition except for the fact that PP[-PRD] should precede CP but PP[+PRD] must follow CP.

     b. Group III (questionable cases) can be reduced to Group II.

     c. Verbs such as *love* allowing object extraposition can belong to cases of Group I.

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[8] As for the *love*-type data, all the 5 native speakers mentioned above regard (28b) as acceptable.

On the basis of the findings in (30), we point out the shortcomings of the previous analyses, which will help us provide an appropriate analysis of object extraposition. First of all, Kim & Sag (2006, 2007) attempt to analyze the three cases of object extraposition under the lexical, constraint-based analysis. In so doing, they have to posit the Extraposition Construction as a sort of lexical rule whose input verbs should be lexically classified into one of the two cases, i.e. obligatory or optional. In considering that as specified in (30), all distinctions among Groups do not mean much, the analysis based on lexically classified verb-types only for object extraposition falls short in capturing a relevant data generalization. Rather, the findings from all the data observations lead us to the generalization that all predicates selecting a CP object allow object extraposition. Second, it is unclear how Kim & Sag (2006, 2007) distinguish *love*-type verbs from *kick*-type verbs. Third, there seems to be a contradiction between LP2 and LP4. Specifically, LP2 ensures that a controller complement must precede its controlled predicative complement while LP4 requires that CP should follow any other complement sisters. When CP-PP[+PRD] sequence occurs in a sentence, LP4 predicts that PP[+PRD] must precede CP while LP2 requires that PP[+PRD] should precede CP since PP[+PRD] is one of its complements. This is another potential theoretical difficulty in their analysis.

Kim (2008) also faces the same theoretical obstacles as Kim & Sag (2006, 2007), because his analysis simply follows Kim & Sag (2006, 2007) in treating the cases of Group I and Group II. Moreover, Kim (2008) proposes a new lexical rule only for *love*-type verbs based on mistaken grammatical judgments. This approach compels him to employ more than two extraposition rules and nonetheless falls short in providing an appropriate analysis of object extraposition.

3. Toward a Unified Constraint-based Analysis

3.1 A New Analysis

The previous analyses have proposed the so-called lexical, constraint-based analysis of object extraposition. In so doing, they postulate two lexical rules such as the Extraposition Construction and Lexical rule for *love*-type verbs, assuming that there are two types of verbs, i.e. obligatory and optional, with respect to the occurrence of *it*. Furthermore, they also posit LP4 constraint based on Kuno's (1987) BNFC. With these theoretical tools, they fail to account for various cases of object extraposition phenomenon. Their failure, we believe, is mainly due to mistaken data generalizations on object extraposition. In fact, the findings from all the data observations including (30) point to the fact that all predicates selecting a CP object allow object extraposition, which can be summarized as follows:

(31) **The Data Generalization on Object Extraposition**

> All English verbs selecting CP object basically allow object extraposition. Seemingly optional or obligatory cases of object extraposition with respect to the occurrence of *it* are not due to the different classes of verbs but due to the LP constraints. The

additional extraposition cases including *love*-type verbs are also not the cases requiring another lexical rule but a subcase of object extraposition generated by the same general extraposition rule.

On the basis of the generalization in (31), we claim that all English verbs selecting CP object basically allow object extraposition. To make this claim work for object extraposition in current HPSG, we propose an optional lexical rule as follows:

(32) Object Extraposition Lexical Rule

$$
\begin{bmatrix}
\textit{pi-rule} \\
\text{INPUT} \quad \left\langle \text{X}, \begin{bmatrix} \text{S} \mid \text{C} \mid \text{SUBCAT} & \left\langle \boxed{1}, \boxed{2}_i, \text{CP}, \boxed{3} \right\rangle \end{bmatrix} \right\rangle \\
\text{OUTPUT} \quad \left\langle \text{Y}, \begin{bmatrix} \text{S} \mid \text{C} & \begin{bmatrix} \text{SUBCAT} & \left\langle \boxed{1}, \text{NP}_i \begin{bmatrix} \text{NFORM} & \textit{it} \end{bmatrix}, \boxed{3} \right\rangle \\ \text{EXTRA} & \left\langle \boxed{2}_i \right\rangle \end{bmatrix} \end{bmatrix} \right\rangle
\end{bmatrix}
$$

This rule is basically similar to the Extraposition Construction by Kim & Sag (2006, 2007) but works differently.[9] Namely, if there are verbs like *blame* with [HEAD *nominal*] object and the object is resolved to CP, then they can be an input of the lexical rule so that as a result, they may have an expletive object and CP in the extraposition. By the same token, the cases of Group II and III such as *expect* and *think* can be an input for the lexical rule if the object subcategorized by the head verb is resolved to CP. Further, this lexical rule enables us to predict that verbs such as *love* allow object extraposition whereas verbs such as *kick* do not. Specifically, *kick* selecting only an NP object cannot be an input for the lexical rule in (32) but *love* selecting CP object can be an input for the rule.

As mentioned above, the previous analyses may have difficulties in applying the LP Constraints mainly due to the contradiction between LP2 and LP4. To avoid this difficulty, we slightly modify the LP4 constraint based on the BNFC as in (33), though we keep the other three LP constraints in HPSG which are independently motivated.

(33) Modified LP4 Constraint

Non-predicative Complement $<$ $\begin{bmatrix} \text{SYN} \mid \text{CAT} \mid \text{HEAD} & \textit{verbal} \end{bmatrix}$

This slight modification will block the contradiction of the two LP constraints in word ordering. For example, when there is a PP[+PRD]-CP sequence like (16d), it is correctly predicted to be illegal in terms of LP2 whereas if there is a PP[-PRD]-CP sequence like (19f), it is predicted to be legal by the modified LP4 constraint.

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[9] As shown in (32), the condition of the input in this lexical rule is that the object of a given verb should be CP. In considering that VP[*infinitive*] object and subject can be extraposed in English, the condition of the input can be changed into HEAD[*verbal*] (=CP or VP[*infinitive*]).

In short, since all cases of object extraposition except the controversial data above can be accounted for in a similar way with Kim & Sag (2006, 2007), our analysis with the newly proposed object extraposition lexical rule in (32) and the modified LP4 constraint in (33) enables us to correctly predict the grammaticality of all the cases including the controversial data.

3.2 Some Consequences

Based on the claim that all English verbs selecting HEAD[*verbal*] object basically allow object extraposition, we propose an optional lexical rule for object extraposition and a slightly modified LP4 constraint in current HPSG in order to account for various cases of object extraposition. This unified constraint-based analysis of object extraposition proposed here can answer the questions in (5a-d) except (5e) as follows:

(5) a. How many object extraposition rules do we need?
        Answer: One Rule.

   b. Is it possible to posit a unified rule for English object extraposition?
        Answer: Yes.

   c. Is it (or Are they) optional or obligatory?
        Answer: Optional.

   d. Do we really have more than three different cases of English object extraposition?
        Answer: No.

   e. Is object extraposition wholly different from subject extraposition? Or do they basically belong to the same phenomenon?

To answer question (5e), we introduce the analysis of subject extraposition in current HPSG and will discuss the consequences of this unified analysis. Current HPSG posits a lexical rule for subject extraposition, which says that if there are verbs selecting CP subject in English, then the verbs may have the expletive *it* on subject position and the CP in the Extra position, to explain the contrast between (34) and (35):

(34) a. [That Johnny speaks loudly] bothers me.

   b. It bothers me [that Johnny speaks loudly].

(35) a. *[That Johnny speaks loudly] seems.

   b. It seems [That Johnny speaks loudly].

In (34), if verbs like *bother* select a CP subject, (34b) also can be allowed in terms of the lexical rule for subject extraposition. However, verbs like *seem* do not select a CP subject so (35a) is disallowed. Unlike (35a), sentence (35b), where the expletive *it* occurs in the subject position, can be generated by the SUBCAT information of the verb. To explain this contrast under our analysis, we provide the following lexical rule:

(36) Subject Extraposition Lexical Rule

$$
\begin{bmatrix}
\textit{pi-rule} \\[4pt]
\text{INPUT} \quad \left\langle \text{X}, \left[\text{S} \mid \text{C} \mid \text{SUBCAT} \ \left\langle \boxed{1}_i, \text{CP}, \boxed{2}\right\rangle\right]\right\rangle \\[10pt]
\text{OUTPUT} \ \left\langle \text{Y}, \left[\text{S} \mid \text{C} \ \begin{bmatrix}\text{SUBCAT} \ \left\langle \text{NP}_i\left[\text{NFORM} \quad \textit{it}\right], \boxed{2}\right\rangle \\ \text{EXTRA} \quad \left\langle\boxed{1}_i\right\rangle\end{bmatrix}\right]\right\rangle
\end{bmatrix}
$$

This lexical rule enables us to correctly predict that sentences like (34) are grammatical as current HPSG does. As you may notice, it is interesting that under our analysis, subject and object extraposition rules are almost the same except for the fact that the expletive *it* occurs in different SUBCAT positions. If the first element of the SUBCAT list is empty in the object extraposition rule in (32), the result is identical to the subject extraposition rule in (36). In other words, there appears to be a possibility for the two rules to merge into a single extraposition rule:

(37) Extraposition Lexical Rule

$$
\begin{bmatrix}
\textit{pi-rule} \\[4pt]
\text{INPUT} \quad \left\langle \text{X}, \left[\text{S} \mid \text{C} \mid \text{SUBCAT} \ \left\langle (\boxed{1},) \boxed{2}_i, \text{CP}, \boxed{3}\right\rangle\right]\right\rangle \\[10pt]
\text{OUTPUT} \ \left\langle \text{Y}, \left[\text{S} \mid \text{C} \ \begin{bmatrix}\text{SUBCAT} \ \left\langle (\boxed{1},) \text{NP}_i\left[\text{NFORM} \quad \textit{it}\right], \boxed{3}\right\rangle \\ \text{EXTRA} \quad \left\langle\boxed{2}_i\right\rangle\end{bmatrix}\right]\right\rangle
\end{bmatrix}
$$

This lexical rule implies that all verbs selecting CP allow extraposition regardless of the grammatical function of extraposed elements.[10] This implication seems to be correspondent to most native speakers' speculation on subject and object extraposition that all verbs selecting CP allow extraposition, which is identical to the claim we made here. Hence, the answer for the question (5e) under our analysis is that subject and object extraposition basically belong to the same phenomenon.

4. Concluding Remarks

There has been a strong belief that English object extraposition seems to be a simple phenomenon to explain. Recent research, however, shows us that English object extraposition is not that simple. The previous analyses within main stream generative grammar have sought to solve various cases of object extraposition, focusing on holding the Projection Principle by Chomsky (1981), but they have fallen short. On the other hand, the lexical, constraint-based analyses by Kim & Sag (2006, 2007) and Kim (2008) in current HPSG also face theoretical and empirical difficulties in

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[10] It does not mean that cases of English adjunct extraposition can be analyzed in the same way.

accounting for complicated variations in object extraposition. Theoretically, they have proposed the lexical classification of verbs with respect to the occurrence of the expletive *it* to distinguish obligatory and optional cases of object extraposition. Further, they posit another lexical rule of object extraposition for *love*-type verbs. In addition to these two rules, they formulate a new LP constraint based on Kuno's BNFC to get the right word order. With these additional theoretical tools, their analyses fall short in giving a suitable explanation on the controversial data mainly because of the wrong data generalizations of object extraposition.

To provide a whole picture of object extraposition, we propose a unified constraint-based analysis of the phenomenon. In doing so, we propose an optional lexical rule and a slightly modified LP4 constraint, on the basis of the claim we made here that all English verbs selecting a CP object basically allow object extraposition. This enables us to provide a simpler explanation in not only the three cases of object extraposition provided by Kim & Sag (2006, 2007) but the additional cases presented by Kim (2008). Furthermore, this unified analysis of object extraposition proposed here is quite similar to the subject extraposition rule in current HPSG, which means we can allow the two lexical rules to merge into a single extraposition rule, namely Extraposition Lexical Rule. We believe that our unified analysis would be more preferable only if it can generate the proper set of English extraposition data.

At present, we are not certain whether the consequences of our claim can be empirically proven to be true. However, it seems to be clear that most native speakers intuitively speculate that all verbs selecting a CP allow extraposition. In this sense, this unified constraint-based analysis is on the right track.

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