Either...or... Constructions: An HPSG Approach

Jungmee Lee
(Seoul National University)

Lee, Jungmee. 2005. Either...or... Constructions: An HPSG Approach. SNU Working Papers in English Language and Linguistics 4, 152-172. The purpose of this paper is to investigate the syntactic and semantic properties of the either...or... construction and to present its formalization within HPSG. In terms of the syntax of the either...or... construction, I will argue that the Symmetry Condition can be captured properly by introducing an ellipsis-based constraint within HPSG and the Left Bracket Thesis by analyzing either as a modifier to the or-disjunctive phrase. In terms of the semantics of the either...or... construction, I will demonstrate that syntactic treatments such as QR analysis and type raising can not derive the wide scope or readings of the either...or... construction in a precise way, and propose a lexical approach in which either functions as a type of the operator indicating a disjunctive scope. (Seoul National University)

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1. Introduction

Concerning the properties of the either...or... construction, there are two assumptions: i) two conjuncts have syntactically and semantically symmetric properties (Neijt 1979, Sag et al. 1985, Larson 1985, Schwarz 1999, Hendriks 2001) and ii) the lexical item either always takes the left-most peripheral position in the coordinate structure (Schachter 1977, Rooth and Partee 1983, Sag et al. 1985, Munn 1993, Schwarz 1999, Hendriks 2001). In this paper, following the terms in Schwarz (1999), each of these two assumptions will be referred to as the Symmetry Condition and the Left Bracket Thesis respectively.

Many English sentences containing the either...or... construction, however, show that these two assumptions can be disobeyed as follows:

(1) a. John wanted to eat either beans or rice.
b. John wanted to either eat beans or rice.
c. John either wanted to eat beans or rice.
d. Either John wanted to eat beans or rice.

In example (1), the syntactic positions of *either* are not restricted in the left-peripheral position of the coordinate structure, and also do not allow the symmetric syntactic/semantic status between two conjuncts. Therefore, in the unbalanced disjunction sentences such as (1), how to accept the Symmetry Condition and the Left Bracket Thesis needs to be discussed in order to reach a precise formalization of the *either...or...* construction.

There is one more interesting property associated with this unbalanced *either...or...* construction. Based on Rooth and Partee’s (1982) proposal on the *wide scope* or reading, Larson (1985) indicates that the syntactic position of *either* is closely related with the interpretation of disjunction. The following presents all of the possible *de-dicto* readings which can be derived from the sentences in (1):

(2)  

a. John wanted to eat either one of beans or rice.
    \[ \rightarrow (1a) \]

b. John wanted either one of eating beans or eating rice.
    \[ \rightarrow (1a), (1b) \]

c. John did either one of wanting to eat beans or wanting to eat rice, but the speaker does not know exactly.
    \[ \rightarrow (1a), (1c), (1d) \]

Interestingly, the sentence in (1a) has three possible readings of (2a-c), whereas the sentences in (1b-d) have only one reading as shown above. In the case of the *wide scope* or reading such as (2b-c), the readings are derived not only from the unbalanced disjunction like (1b-d) but also from the balanced disjunction like (1a). In this paper, these *wide scope* or readings will be examined along with the syntactic analysis of the *either...or...* construction. My proposal will focus on the syntactic position and the semantic function of *either*. *Either* will be analyzed syntactically as a modifier to a coordinate phrase and semantically as a type of the operator for marking disjunctive scope.
2. Critical review of previous analyses

2.1 Larson’s (1985) movement analysis

2.1.1 Larson’s (1985) account of the *either...or...* construction

Larson analyzes the syntax of an unbalanced disjunction as a variable binding between the moved *either* and its trace as in (3):

(3)  a. John wanted to eat either beans or rice.
    b. John wanted to *either* eat *t* beans or rice.
    c. John *either* wanted to eat *t* beans or rice.
    d. *Either*; John wanted to eat *t* beans or rice.

As a principle of *either*-movement, Larson adopts the Empty Category Principle (ECP) and attempts to modify Lasnik and Saito’s (1984) definition of Antecedent Government in order to capture the finiteness-condition of *either*-movement: the third clause is amended such that \( \gamma \) includes only tensed Ss.

(4) \( \beta \) ANTECEDENT GOVERNS \( \alpha \) if

( i ) \( \beta \) c-commands \( \alpha \),

( ii ) \( \beta \) and \( \alpha \) are coindexed,

( iii ) there is no \( \gamma \) (\( \gamma = \text{tensed S} \)) such that \( \beta \) c-commands \( \gamma \) and \( \gamma \) dominates \( \alpha \), unless \( \alpha \) is the head of \( \gamma \).

Based on this modified principle which predicts a syntactic position of *either*, Larson generalizes the disjunctive scopal reading as follows:

(5) When *either* occurs displaced from its associated *or*, then its overt surface syntactic position explicitly ‘marks’ the scope of disjunction. On the other hand, when it occurs undisplaced and adjacent to its disjunction in surface form, then its potential surface positions delimit the potential scopes of *or*.

2.1.2 Limitations of Larson’s (1985) approach

Although Larson’s observation of the relationship between the syntactic
position of *either* and the scopal readings of disjunctive phrases is seminal in some respect, his movement analysis does not provide a sufficient and logical account of the *either*...or... construction.

First, as a strong empirical evidence, Larson's analysis does not make an accurate prediction on the syntactic position of *either*. In order to validate his approach, Larson claims that the landing site of moved *either* is restricted to that of the sentential adverbs such as *probably*. However, Larson's prediction is rejected by (6):

(6)  ① We ② could ③ have ④ been ⑤ playing ⑥ basketball or baseball.

⇒ possible positions of *probably* : ①, ③
⇒ possible positions of *either* : ①, ②, ③, ④, ⑤, ⑥

As shown above, the position of *either* is less restricted than that of sentential adverb *probably*, thus the movement approach which requires an assumption on the confined landing site of a moved element is empirically invalidated.

Second, the assumption Larson adopts for the Symmetry Condition and the Left Bracket Thesis does not accurately account for the disjunctive scopal readings. He regards these two assumptions as a D-structure stipulation, thus if the surface form of the *either*...or... construction appears to be asymmetric, Larson analyzes *either* as a moved element at S-S and it cannot undergo movement anymore at LF. On the other hand, if the surface form of the *either*...or... construction shows a symmetry between the conjuncts, Larson assumes that LF movement must occur in order to allow a scopal reading. The assumption, however, does not guarantee a precise scopal reading as illustrated in (7) and (8):

(7)  a. John wanted to eat *either* [beans or rice].  (D-S)
    b. John wanted to *either*; eat *ti* [beans or rice].  (S-S)
    c. John wanted to *either*; eat *ti* [beans or rice].  (LF 1)
(8)  a. John wanted to *either* [eat beans or eat rice].  (D-S)
    b. John wanted to *either*; *ti* [eat beans or eat rice].  (S-S)
    c. John wanted to *either*; *ti* [eat beans or eat rice].  (LF 1)
    d. John *either*; wanted to *ti* [eat beans or eat rice].  (LF 2)

As shown in (7) and (8), according to Larson's approach, two sentences
which can be used to convey the identical meaning by a gapping do produce the different interpretation: (7) is unambiguous but (8) has two possible scopal readings.

Furthermore, Larson's interpretative prediction is wrong in the case of (8). The surface form of (8b) can produce the scopal reading of (8c), but the reading of (8d) is impossible to be produced from (8b). Since the disjunctive reading is bound at the moment when either combines with a verbal element, either in (8b) cannot move beyond the embedded to-infinitival at LF. In this respect, Larson's treatment which assumes the Left Bracket Thesis as a D-structure stipulation not considering the syntactic category or semantic type of each conjunct is problematic. As a solution to this problem, I will argue that the Left Bracket Thesis needs to be realized as a S-structure stipulation and either of the either...or... construction needs to be analyzed as a modifier to the or-disjunctive phrase. In addition, I will claim that the SYNSEM information of each disjunct needs to be considered in order to capture the accurate scopal readings of the either...or... construction.

2.2 Schwarz's (1999) gapping analysis

2.2.1 Schwarz's (1999) account of the either...or... construction

Schwarz (1999) argues that the syntactic analysis of the either...or... construction can be dealt with more properly by implementing a gapping analysis as in (9):

(9) a. John wanted to eat either [NP beans or rice].
   b. John wanted to either [VP eat beans or eat rice].
   c. John either [VP wanted to eat beans or wanted to eat rice].
   d. Either [S John wanted to eat beans or John wanted to eat rice].

Schwarz’s supporting argument for a gapping analysis is twofold. First, the gapping analysis has more explanatory power for a particular type of coordination, a 'limping disjunction' with dangling remnants as exemplified in (10b). The movement analysis, however, cannot explain the discrepancy of the grammatical judgement between the source sentence (11a) and the derived sentence (11b):
(10) a. Either they locked you or me up.
   b. Either [they locked you or they locked me up].
(11) a. They locked either [NP you or me] up.
   b. Either they locked ti [NP you or me] up.

The second supportive argument for Schwarz's (1999) analysis is associated with a gapping field, which means the impossible syntactic domain of gapping. The gapping field captures the locality condition of the *either...or...* construction more accurately than Larson's treatment as manifest in the following:

(12) a. Some revised their decision to cook rice on Monday and others revised [their decision to cook rice on Tuesday].
    [a complex NP island]
   (12a)
 b. Some were wondering whether to write to Bill and others were wondering [whether to write to Mary].
    [a wh-island]
   (12b)
 c. The first letter says that you should pay tax and [the second letter says that you should pay V.A.T].
    [a finite clause island]
   (12c)
 d. Vivek wanted for Nishi to buy the video, and Carry wanted [for Nishi to buy the ice cream].
    [a for-infinitival island]
   (12d)
 e. Some wanted to write novels and [others wanted to write plays].
    [a to-infinitival]

As demonstrated above, gapping fields contain not only a complex NP island in (12a) and a wh-island in (12b), but also a finite clause in (12c) and a for-infinitival in (12d). Without modifying an accepted principle as in Larson's treatment of ECP, the gapping phenomenon itself predicts the syntactic position of *either* well enough to account for the impossibility of *either*-movement in the for-infinitival sentences as well as in the finite sentences. Whereas a for-infinitival is not considered a syntactic island in Larson's analysis, a gapping analysis itself predicts a discrepancy of grammaticality between a non-finite sentence and a finite sentence, even between a for-infinitival and a to-infinitival.
2.2.2 Limitations of Schwarz's (1999) approach

The most critical problem of Schwarz's analysis is that he denies Larson's indispensable insight on the correlation of the syntax and semantics in the *either...or...* construction. Adducing Munn's (1993) Quantifier Raising analysis as an enhanced version of Larson's insight on disjunctive scopes, Schwarz argues that a quantifier scope is not restricted in the same way as the surface position of *either*. Consider the following sentences presented by Schwarz (1999: 348-349):

(13) a. Some sheriff locked every gangster up.
    b. Either they locked you or me up.

With the sentences in (13), Schwarz indicates that the interpretation pattern of (13a) is not identical to (13b): (13a) has a reading that the object [every gangster] outscopes the subject [some sheriff] whereas (13b) which is assumed to have *wide scope* or reading do not fully pass muster on a grammaticality judgement test. Based on this degraded grammaticality, Schwarz argues that the *either...or...* construction does not operate in association with a scopal reading.

Although Schwarz's argument on the different interpretative pattern between (13a) and (13b) is correct, it cannot reject even Larson's insight on the correlation between the syntactic position of *either* and the scopal readings since the scope-bearing elements are not restricted to the quantificational determiners. In this paper, I will assume that Schwarz's rejection of Larson's insight is too a hasty conclusion to capture a regularity shown in the disjunctive scopal readings, and basically, Larson's assumption that the position of *either* has some implications concerning the scopal readings will be maintained. The critical problems of QR approach and my new lexicon-based approach will be provided in section 4.

3. The syntax of the *either...or...* construction

3.1 The basic structure of the *or*-disjunctive phrase

Various analyses on the basic structure of coordination have been
presented in many syntactic frameworks (Ross 1967, Sag et al. 1985, Munn 1992, Kayne 1994, Johannessen 1998). There are two main issues in previous studies of the coordinate structure: i) flatness of a coordinate structure and ii) headedness of the daughters in the coordinate structure (Abéille 2003). In this paper, I assume that the coordinate phrase is a flat and non-headed structure. A flat structure captures the feature-sharing between conjuncts and reflects the identical contribution of the conjuncts in inheriting the syntactic features. And a non-headed structure captures the discrepancy between syntactic headedness and semantic headedness.

As a basic constraint on the coordinate phrases, I adopt Sag, Wasow and Bender’s (2003: 485) constraint in (14).

\[
(14) \text{coord-cx} : \\
\begin{align*}
&\text{MOTHER} \\
&\quad \left[ \begin{array}{l}
\text{SYN} \\
\quad \left[ \begin{array}{l}
\text{HEAD} \quad \text{FORM} \quad 1 \\
\text{VAL} \quad 2 \\
\text{GAP} \quad A \\
\end{array} \right] \\
\text{SEM} \\
\quad \left[ \begin{array}{l}
\text{IND} \quad S_0 \\
\end{array} \right]
\end{array} \right] \\
&\quad \left[ \begin{array}{l}
\text{DTRS} \\
\quad \left[ \begin{array}{l}
\text{SYN} \\
\quad \left[ \begin{array}{l}
\text{HEAD} \quad \text{FORM} \quad 1 \\
\text{VAL} \quad 2 \\
\text{GAP} \quad A \\
\end{array} \right] \\
\text{SEM} \\
\quad \left[ \begin{array}{l}
\text{IND} \quad S_1 \\
\text{RESTR} \quad <[\text{ARG} \quad <S_1 \ldots S_e]> \\
\end{array} \right]
\end{array} \right] \\
\quad \left[ \begin{array}{l}
\text{SYN} \\
\quad \left[ \begin{array}{l}
\text{HEAD} \quad \text{FORM} \quad 1 \\
\text{VAL} \quad 2 \\
\text{GAP} \quad A \\
\end{array} \right] \\
\text{SEM} \\
\quad \left[ \begin{array}{l}
\text{IND} \quad S_e \\
\end{array} \right]
\end{array} \right]
\end{align*}
\]

As demonstrated in (14), this constraint captures the feature-sharing between the conjuncts. The SYN-values and the type of the INDEX-values are identical between the conjuncts. This implies that the Symmetry Condition is adequately represented in constraint (14) without having to propose any additional schema.

The coordinate structure constraint in (14), however, only permits the conjunction of syntactically identical elements such as in (1a), not accounting for the unbalanced disjunctive phrases such as in (1b-d). In order to analyze the syntax of the either...or... construction in a more satisfactory way, therefore, more elaborate syntactic treatments are required. Based on the above-mentioned syntactic advantages of
Schwarz's (1999) reduction approach, I will present an elliptical analysis of the or-disjunctive phrase within the HPSG framework.

As the most recent and simplest version for analyzing an elliptical construction, I will follow Beavers and Sag's (2004) formalization. In Beavers and Sag, it is assumed that redundant left-peripheral materials in the second daughter's DOM list do not appear in the mother's DOM list as in (15):

\[(15) \text{final-cnj-cx} \Rightarrow \]
\[
\begin{array}{c}
\text{MTR} \\
\text{SYN} 0 \\
\text{CRD} + \\
\end{array}
\begin{array}{c}
\text{DTRS} \\
\text{SYN} 0 \\
\end{array}
\begin{array}{c}
\text{DOM} \{ \text{FRM} [A \oplus B \oplus D \oplus C] \} \\
\text{DOM} \{ \text{FRM} [A \oplus B] \} \\
\text{DOM} \{ \text{FRM} [D] \} \\
\end{array}
\]

Assuming that Beavers and Sag's constraint is correct, the or-disjunctive phrase of the either...or... construction in (16) can be described as in the tree diagram of (17).

\[(16) \]
\[a. \text{John wanted to either eat beans or rice.} \]
\[b. \text{John wanted to either [VP eat beans] or [VP eat rice].} \]

\[(17) \]
\[
\begin{array}{c}
\text{FRM <eat, beans, or, rice>} \\
\text{DOM <[V eat], [NP beans], [conj or], [NP rice]>} \\
\text{SYN VP} \\
\text{CRD} + \\
\end{array}
\begin{array}{c}
\text{FRM <eat,beans>} \\
\text{SYN VP} \\
\end{array}
\begin{array}{c}
\text{FRM <or>} \\
\text{SYN CONJ} \\
\end{array}
\begin{array}{c}
\text{FRM <eat, rice>} \\
\text{SYN VP} \\
\end{array}
\]

As shown in (16), the problem of how to reconstruct the elided elements can be solved by Beavers and Sag's constraint itself, which captures the Symmetry Condition of the coordinate structure. That is, since the first conjunct has a SYN-value of VP, the second conjunct is also reconstructed into VP.

In addition to the Symmetry Condition, how the Left Bracket Thesis can be maintained in my proposed analysis will be presented in the next section. In section 3.2, I will discuss the proper syntactic position of either and its implications for the Left Bracket Thesis.
3.2 *Either* as a modifier to the *or*-disjunctive phrase

3.2.1 The modification pattern of *either*

The Left Bracket Thesis, which is rejected in Larson's movement analysis as a restriction in S-structure, can be maintained in my proposal by analyzing *either* as a modifier to the *or*-disjunctive phrase. In my proposal, *either* is not analyzed as one of conjunctions which jointly occupies a syntactic node with *or* like Larson's analysis, but a modifier to the *or*-disjunctive phrase. The following shows the two cases of modification by *either*: modifying the non-elided *or*-disjunctive phrase in (18) and modifying the elided *or*-disjunctive phrase in (19).

(18) a. John wanted to eat [*either* [*beans* or *rice*]].
   b. [*hd-mod-ph*]

   ![Diagram for (18a)]

   ![Diagram for (18b)]

(19) a. John wanted to [*either* [*eat* *beans* or *eat* *rice*]].
   b. [*hd-mod-ph*]

   ![Diagram for (19a)]

   ![Diagram for (19b)]

Based on the syntactic representations in (18) and (19), I note that there are three additional properties unique to the *either...or...* construction,
among which two properties need to be stipulated in the SYN-feature of *either*.

First, *either* attaches to the maximal projections, not the non-maximal projections (Neijt 1979). This modification pattern goes against conventional assumptions on the modifier, which is analyzed to combine with the X'-level. Based on this previous observation, I propose that *either* is a particular type of a modifier which attaches to the maximal projection, and will describe this property in the lexical information of *either* as follows:

\[
(20) \quad < \text{either}, \left[ \begin{array}{c}
\text{SYN} \\
\text{MOD} \\
\text{COMPS} \\
\text{CRD}
\end{array} \right] \text{[SPR ( )]}> 
\]

In (20), by restricting the *either*-modified element as a phrasal-type with saturated SPR and COMP values, *either* can modify only the XP-level element.

The second unique property of the *either...or...* construction is that the modification pattern of *either* is restricted to a specific type of the coordinate phrase as shown in (21):

\[
(21) \quad \begin{align*}
a. \text{John wanted to eat both beans and/or/nor rice.} \\
b. \text{John wanted to eat either beans and/or/nor rice.} \\
c. \text{John wanted to eat neither beans and/or/nor rice.}
\end{align*}
\]

This modification pattern by *both*, *either*, and *neither* cannot be captured only with the CRD feature in (15), since it simply indicates that the coordinate structure contains a conjunction. I propose that more detailed features within the coordinate structure are necessary as in (22a) and the coordinate structure which *either* modifies must have the feature structure such as (22b).

\[
(22) \quad \begin{align*}
a. \left[ \begin{array}{c}
\text{CRD} \\
\text{DIS} \\
\text{NEG}
\end{array} \right] \text{[coordinated disjoined ]} \\
b. \quad < \text{either}, \left[ \begin{array}{c}
\text{SYN} \\
\text{MOD} \\
\text{CRD} \\
\text{DIS} \\
\text{NEG}
\end{array} \right] \text{[coordinated disjoined ]}> 
\end{align*}
\]

The third unique property of the *either...or...* construction is that the syntactic position of *either* is not restricted to some specific positions as
Larson's approach. In my analysis, since *either* appears in the left-adjacent position to the *or*-disjunctive phrase, what *either* can modify depends on which syntactic category of the first conjunct is permitted. However, it has not been considered in any syntactic theory to restrict the possible grammatical categories of the first conjunct in the coordinate structure. In my analysis, the grammatical positions of *either* are predicted only with the local restrictions by the gapping field and the lexical information of *either* suggested in (20) and (22b). In this respect, *either* is basically analyzed as a cross-categorial modifier. Larson's approach which restricted the syntactic position of *either* to a particular position in the sentence level revealed its limitation in predicting the grammaticality accurately, but my analysis makes it possible to predict the accurate syntactic position of *either*.

### 3.2.2 Advantages of the modifier analysis of *either*

First, this modifier analysis can avoid the burdensome consequences of the syntactic integration of *either* and *or* as a conjunction within the coordinate structure as in Larson's analysis. Reconsider Larson's structure which contains both *either* and *or* in the CONJ-node. If we adhere to this analysis within HPSG, it is unavoidable to assume a flat structure which contains two conjunction daughters and two conjunct daughters. It can only be described in a way that adds one more conjunction daughter in constraint (15). This treatment, however, is problematic in terms of the analysis of the semantic restriction. In (15), since a semantic head within a coordinate phrase is not a conjunct but a conjunction, it is semantically assumed that a conjunction selects the conjuncts as its semantic arguments. If *either* is added as an equivalent daughter within this normal coordinate structure, any attempts to reestablish the semantic restriction between the conjuncts, *or*, and *either* will raise the complicated problems.

Second, the modifier analysis can capture the independent semantic function of *either*. Zimmermann (2000: 267) argues that the function of *either* is to explicitly mark exhaustivity. According to Zimmermann, there are two kinds of disjunctions: the open disjunction and the closed disjunction. Closed disjunction ends on a low phrase-final tone and is interpreted to cover the space of all epistemic possibilities, but open
disjunction ends on a high phrase-final tone and does not make any claim to completeness in the epistemic possibility of each disjunct. Of these two types of disjunction, Zimmermann notices that the either-or disjunction always requires a closure intonation, unlike the disjunction without either. Thus, the either-or disjunction is analyzed as a closed disjunction and either is analyzed as a marker of exhaustivity. Based on Zimmermann’s (2000) claim, Hendriks (2004) argues that either has a semantic function which restricts the set membership. More specifically, he argues that the function of either is to exclude all the contextually relevant set members except the elements focused on. Considering Zimmermann’s and Hendriks’ claim, to assign an independent syntactic position separated from the or-disjunctive phrase is a more proper analysis.

The third advantage of the modifier analysis is related to the formalization issue within HPSG. In accordance with HPSG, a modifier is analyzed as a semantic head in a head-modifier phrase, although it is not a syntactic head as stipulated in (23):

(23) Semantic Principle (Pollard and Sag 1994: 56) 
In a headed phrase, the CONTENT value is token-identical to that of the adjunct daughter if the DTRS value is of sort head-adj-struc, and with that of the head daughter otherwise.

Through this principle, the important characteristics of the either...or... construction that either-rel takes or-rel as its semantic argument can be guaranteed. If the either...or... construction is analyzed as the other types of the headed phrase, the semantic relation will be analyzed as a reversed one.

4. The semantics of the either...or... construction

4.1 disjunctive readings in the either...or... construction

Concerning these scopal readings, no sufficient investigation has been presented except in Larson’s (1985) and Munn’s (1993) analyses. Larson’s analysis was critically reviewed in section 2. In Munn’s analysis, I also note that there is a critical problem. Munn argues that the two de dicto readings of (1a) can be captured in the same way as Quantifier Raising.
However, what can be derived from the QR analysis is the *de re* reading and the *de dicto* reading which conjoins the entities, not the *de dicto* reading which conjoins the propositions. Consider the following rough logical representations in (24).

(24) a. [either x □ □ beans'(x) or rice'(x)] want'(john', eat'(john', x))
   b. want'(John', [(either x □ □ beans'(x) or rice'(x)) eat'(john', x)]

In (24), (24a) represents the *de re* reading of (1a), and (24b) represents the *de dicto* reading of (1a) which conjoins two entities. Therefore, Munn's analysis does not contribute to a solution of the conundrum of the *wide scope* or reading which conjoins two propositions such as (2b) and (2c).

Munn's insight on the *either...or...* construction, nevertheless, should not be discarded, considering the semantic difference between a *de re* reading and a *de dicto* reading of conjoining entities.\(^1\) In accordance with Munn's analysis, I will consider *either* as a type of operator, and *either-rel* as a stored element before retrieval. Stored operators are passed up successively to higher levels in the structure until an appropriate scope assignment locus is reached. Adhering to Pollard and Sag's (1994) assumption, a retrieval of quantifiers occurs only when the CONT value is related with a verbal expression.\(^2\) Thus, it is at VP or S where the stored operators are retrieved from STORE and integrated into the meaning in QUANTS, allowing a scopal interpretation.

Based on this operator analysis, a critical problem in representing the disjunctive readings of the *either...or...* construction is the *wide scope* or reading, which appears to conjoin the nominal elements syntactically but the propositions semantically as in (1a).

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\(^1\) These two *de re/de dicto* readings conjoining the entities can also be formalized within HPSG in accordance with Munn's (1993) QR analysis. Assuming *either-rel* to be an operator functioning as a scope-marker, the stored *either-rel* which takes referential *or-rel* as its semantic argument is retrieved when it reaches a proper locus. Although I will not provide the formalized forms of these *de re/de dicto* readings in this paper, the representation of these readings can be captured in accordance to the treatment of quantifier scope within HPSG.

\(^2\) In Pollard and Sag (1994), this verbal expression is stipulated as a *psoa*-type, and the retrieval pattern is captured by the well-formedness constraint as follows: (25) [RETRIEVED nelist] → [SYNSEM□□LOC□□CONT *psoa*]
4.2 Type raising via a syntactic treatment

In order to solve the conundrum of the wide scope or reading, I note that 'type raising' is one possibility. To begin with, consider the or-disjunctive phrase without either, which forms a minimal pair with (1a).

(26) John wanted to eat beans or rice.

What elements are conjoined in (24)? My analysis on the syntax of the either...or... construction is illuminating in this respect. All of the possible reconstructions of the elided elements is like (26).

(27) a. John wanted to eat [NP beans or rice].
    b. John wanted to [VP eat beans or eat rice].
    c. John wanted [VP to eat beans or to eat rice].
    d. John [VP wanted to eat beans or wanted to eat rice].
    e. [S John wanted to eat beans or John wanted to eat rice].

As shown in (27), to derive a wide scope or reading in a simple or-disjunctive phrase is possible only through this syntactic analysis. In the case of the either-or disjunctive phase, however, this syntactic approach is not possible. Consider an identical syntactic method which reconstructs the elided elements.

(28) a. John wanted to eat either [NP beans or rice].
    b.*John wanted to [VP eat either beans or eat rice].
    c.*John wanted [VP to eat either beans or to eat rice].
    d.*John [VP wanted to eat either beans or wanted to eat rice].
    e.*[S John wanted to eat either beans or John wanted to eat rice].

As shown in (28), the syntactic treatment in the either-or disjunction phrase does not guarantee a wide scope or reading, since either appears within the or-disjunctive phrase violating the Left Bracket Thesis. That is, syntactically either must modify the or-disjunction phrase in accordance with the Left Bracket Thesis, and the boundary for reconstructing elided elements is also guaranteed by the Left Bracket
Thesis. Therefore, if accepting both the Symmetry Condition and the Left Bracket Thesis, type raising through a syntactic operation as in a simple or-disjunctive phrase cannot derive a wide scope or reading in an ambiguous case like (1a).

4.3 A lexicon-based approach to the wide scope or readings

In this section, I will present my proposal on the lexical treatment of the wide scope or readings in the either...or... construction. In order to represent a more accurate interaction pattern between the syntax and the semantics of the either...or... construction, I will classify the wide scope or readings into two types: (i) syntactically conjoining two verbal elements and semantically conjoining two propositions as in (1b-d), and (ii) syntactically conjoining two nominal elements and semantically conjoining two propositions as in (1a).

4.3.1 The wide scope or reading from a verbal disjunction

Consider the wide scope or readings derived from the syntactic disjunction of two verbal elements.

(29) a. John wanted to either eat beans or rice.
   b. John either wanted to eat beans or rice.
   c. Either John wanted to eat beans or rice.

In this case, analyzing the sentences into a sentential or verbal disjunction is possible only with the syntactic analysis as in the simple or-disjunctive phrase. Considering the Symmetry Condition and the Left Bracket Thesis, these sentences can be analyzed as in (30).

(30) a. John wanted to either [vp eat beans or eat rice].
    b. John either [vp wanted to eat beans or wanted to eat rice].
    c. Either [s John wanted to eat beans or John wanted to eat rice].

As shown in (30), when either syntactically modifies the verbal disjunctive phrase, VP or S, the disjunctive reading is unambiguous only deriving the wide scope or reading which conjoins two propositions. More
specifically, the syntactic approach alone can sufficiently represent that
(30a) has its scope within the embedded VP and (30b-c) have their scope
within the matrix VP. This shows a case where the syntax and the
semantics match each other. The simplified syntactic structure and the
lexical entry of either in this case is presented in the following.

(31) a. $\begin{array}{c}
\text{VP} \\
\text{either}
\end{array}$

$$\text{VP [CRD [DIS [NEG -]] : ]}$$

b. $\begin{array}{c}
\text{MOD} \\
\text{VP/S : [ ]}
\end{array}$

$$\text{INDEX } s$$

$$\text{RESTR } \left\langle \text{QUANT } \left[ 2 \text{ either-rel } \right] \right\rangle$$

$$\text{NUCL } \left[ \text{ or-rel } \right]$$

$$\text{CONT } [1]$$

$$\text{STORE } \left\{ 2 \right\} - \left\{ 2 \right\}$$

As demonstrated in (31), when either modifies VP or S, either-rel is
retrieved at the same time and the wide scope or reading which conjoins
the propositions is produced.

Through this lexical approach, even what Larson missed in his analysis
can be captured exactly here. Reconsider the scopal readings in (7) and
(8). According to Larson's analysis, (8b) has an ambiguous scopal reading
since either can undergo LF-movement to the position of either in (8c-d).
However, as I indicated in section 2, this interpretation is not accurate.
In my analysis, this interpretation pattern can be captured accurately
by the lexical entry of either in (31b), since either-rel must be retrieved
at the same time when either modifies VP.

4.3.2 The wide scope or reading from a nominal disjunction

The second type of the wide scope or readings is derived from a
sentence like (1a). As examined in the previous section, the
semantic representation of (1a) cannot be dealt with by the
syntactic treatment of type-raising, since either modifies the nominal
disjunction syntactically but it implies the disjunctive readings
between the propositions semantically. As a solution to this syntax-semantics mismatch, I propose a lexical approach as follows:

(32) a. \[ \text{NP} \quad \text{either} \quad \text{NP} \quad [\text{CRD} \quad [\text{DIS} \quad [\text{NEG} \quad -]]) \quad :] \]

b. \[
\begin{array}{c}
\text{MOD} \quad \text{NP: } [] \\
\text{INDEX} \quad s \\
\text{QUANT} \quad \{ \} \\
\text{NUCL} \quad [\text{ARG} \quad s_1] \\
\text{ARG} \quad s_2 \\
\text{STORE} \quad [2 \text{either-rel}] \\
\end{array}
\]

This approach adopts a method to stipulate the semantic type of the or-disjunctive phrase in the lexicon of either. In (32b), although either modifies NP syntactically, or takes the situational indices s₁ and s₂ as its semantic arguments. Therefore, either-rel cannot be retrieved until or combines with the verbal elements syntactically. As a result, in (32b), either-rel remains as a STORE-value, and is not retrieved as a QUANTS-value. This stored value of either-rel will be retrieved when or combines with the situational indices.

In order to gain this type of the wide scope or reading in a more accurate way, a lexical entry for or is also required, which stipulates that or conjoins NP syntactically but the propositions semantically. This lexical entry for or does not belong to a new approach since or can undergo type-raising as suggested by Rooth and Partee (1982). The lexical entry in (33) captures this property of type-raising by or.

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3) Adhering to Sag, Wasow and Bender’s (2003: 136) approach, I assume that the verbal expressions have the semantic values of [MODE prop] and [INDEX s₁, s₂, s₃... ] whereas the nominal expressions have the semantic values of [MODE reference] and [INDEX i, j, k... ].
(33) \[
\begin{array}{l}
\text{SYN} \quad [\text{HEAD} \ conj ] \\
\text{ARG-ST} \quad \langle \text{NP}_1, \text{NP}_2 \rangle \\
< \text{or,} \quad \left[\begin{array}{l}
\text{INDEX} \\ 
\text{SEM} \\
\text{RESTR} \quad \left[\begin{array}{l}
\text{RELN} \ or \\
\text{ARG} \left[\begin{array}{l}
\text{MODE prop} \\ 
\text{INDEX } s_0 \\
\text{INDEX } s_1 \\
\text{INDEX } s_2 \\
\end{array}\right] \right] \\
\end{array}\right] >
\end{array}
\]

In (33), or takes two NPs as its syntactic arguments but two situational indices as its semantic arguments. The or-disjunctive phrase, which reflects the lexical entry of or, is represented in (34).

\[
(34) \quad \left[\begin{array}{l}
\text{MOTHER} \\
\text{SYN} \quad [\text{NP} \\
\text{SEM} \quad [\text{INDEX } s_1] \\
\text{DTR} \quad \left[\begin{array}{l}
\text{SYN} \quad [\text{NP} \\
\text{SEM} \quad [\text{INDEX } s_1] \\
\text{HEA}_{\text{con}} \text{D}^{\text{prop}} \\
\text{INDEX } s_0 \\
\text{RESTR} \quad \left[\begin{array}{l}
\text{ARG} \left[\begin{array}{l}
\text{INDEX } s_1, s_2 \\
\end{array}\right] \right] \\
\end{array}\right] \right] \\
\end{array}\right]
\]

Through this lexical approach, the wide scope or reading in (1a), which cannot be derived via the syntactic treatment, can be derived accurately.

5. Conclusion

In this paper, the syntactic structure and the disjunctive scopal reading of the either...or... construction are discussed within the HPSG framework. Indicating the limitations of the movement analysis, I argued that the elliptical approach is more proper to analyze the or-phrase, and furthermore I proposed that either must be analyzed as a modifier to or-phrase. Based on this syntactic representation, I classified the wide scope or readings into two types and presented the lexical entry of either according to each type.

This lexicon-based approach leads to a more elaborated syntactic/semantic formalism of the either...or... construction, correctly representing the Symmetry Condition and the Left Bracket Thesis within HPSG. Furthermore, the syntactic and semantic function of the lexical item either becomes manifest in my analysis. It takes the syntactically independent position as a modifier to the disjunctive or-phrase and
functions as a type of the operator indicating the disjunctive scope. And finally, while pursuing the formalism within HPSG, I could achieve the more accurate representation of the *either...or...* construction on the level of the syntax-semantics interface.

References


Jungmee Lee
jungmee_lee@hotmail.com