Syntax of either in either...or... sentences *

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1. Introduction

This paper proposes an analysis of the syntax of either in either ... or ... sentences:

(1) John will eat either rice or beans.

An obvious assumption to make is that *either* is always the sister of a disjunction phrase (e.g. Sag, Gazdar, Wasow and Weisler 1985). Applying this assumption to (1): if we assume that *rice or beans* is a disjunction phrase (*DisjP*), and *rice* and *beans* are the *disjuncts*, then *either* does appear adjacent to this DisjP and is its sister:

(2) John will eat either [DisjP] rice or beans].

As Larson (1985), Schwarz (1999), den Dikken (2006), a.o. have observed, however, this view that *either* must be the sister of DisjP is challenged by examples like the following:

- (3) a. John will either eat rice or beans.
 - b. John either will eat rice or beans.
 - c. Either John will eat rice or beans.
- (4) a. John will either eat rice or he will eat beans.
 - b. John either will eat rice or he will eat beans.

Assuming that DisjP is still *rice or beans* in (3a-c), *either* is higher than the sister of DisjP and separated from the DisjP by overt material. For this reason, I call examples like (3a-c) *either-seems-high* sentences, adapting den Dikken's (2006) terminology. In (4a,b), the DisjP coordinates two TP clauses, and *either* appears to be embedded in the first

^{*} I am grateful to Itai Bassi, Keny Chatain, Marcel den Dikken, Danny Fox, Aron Hirsch, Michael Kenstowicz, Richard Larson, David Pesetsky, and Roger Schwarzschild for helpful comments and feedback. All errors are my own.

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disjunct. Because *either* appears lower than the sister of DisjP in (4a,b), I call such examples *either-seems-low* sentences. *Either-seems-high* and *either-seems-low* sentences apparently violate the generalization that *either* is always the sister of a disjunction. In contrast, I call sentences like (2) *either-seems-normal* sentences since *either* seems to be in its "normal" position, i.e. the sister of DisjP.

This paper will present an analysis of *either*-seems-normal, *either*-seems-high and *either*-seems-low sentences. The analysis has two components: movement of *either* and ellipsis. First, *either* originates in DisjP, and moves to the sister of DisjP, with the result that *either* occupies two distinct positions. This movement can be overt or covert. Covert movement derives *either*-seems-low sentences. Second, ellipsis may apply independently to the noninitial disjuncts. When it does, *either*-seems-high sentences arise.

The movement part of the analysis can be summarized as follows. *Either* originates inside the DisjP, and moves to become the sister of DisjP (assuming it is Spec, DisjP).¹

(5)
$$\left[\text{DisjP Either}_i \left[\text{Disj'} \dots \text{t}_i \dots \text{or} \dots \right] \right]$$

Independent of movement of *either*, ellipsis may apply. It is optional and targets left-edge material in the noninitial disjuncts. Compared to (5), (6) adds ellipsis of repeated material X in the second disjunct, and presents the entire analysis involving both movement and ellipsis:

(6)
$$\left[\text{DisjP Either}_i \left[\text{Disj'}, t_i X \dots \text{ or } X \dots \right] \right]$$

According to this proposal, *either*-seems-high sentences (3a-c) are a result of pronouncing the high copy of *either* that is the sister of DisjP, plus ellipsis in the second disjunct. The elided parts are illustrated below. Note that *either* in all these sentences does appear next to DisjP and is hence the sister of the DisjP:

- (7) a. John will either [DisjP eat rice or eat beans].
 - b. John either [DisiP will eat rice or will eat beans].
 - c. Either [DisiP John will eat rice or John will eat beans].

Finally, *either*-seems-low sentences are a result of pronouncing *either* in its base position. The following sentences are the corresponding analyses of (4a,b), with covert movement of *either* (bold font indicates the pronounced copy, and grayed text indicates the unpronounced copy):

- (8) a. Either; John will **either**; eat rice or he will eat beans.
 - b. Either; John either; will eat rice or he will eat beans.

The two components of this analysis, movement of *either* and ellipsis, are motivated by four empirical generalizations: the behavior of verb-particle constructions, *either*-seems-low sentences, islands and scope. Among these four generalizations, the first suggests

¹ The initial position of *either* is subject to restrictions. There is a lower bound to how low it can be: it must c-command the leftmost focus (cf. evidence from Hendriks (2001, 2003) and den Dikken (2006)). This fact is not directly relevant to the point made in this paper, however, so I will not discuss it any further.

that ellipsis can happen. Island facts and *either*-seems-low sentences motivate the movement of *either*. Ellipsis and movement of *either* together explain the scope facts.

The empirical generalization about verb-particle constructions can be found in Schwarz (1999) and Han and Romero (2004). For the sake of space, I do not repeat it here, but merely summarize their conclusion based on their observations: all *either*-seems-high sentences are derived from ellipsis. (9a) is an abstract form of an *either*-seems-high sentence, with *either* being separated from the apparent DisjP by overt material ... X They argue that (9a) is derived from (9b) with ellipsis of ... X ... in the second disjunct:

Ellipsis alone is not enough, however. It cannot account for the other three empirical generalizations. It does not account for *either*-seems-low sentences because there is nothing to elide. Furthermore, evidence involving islands suggests that *either* in *either*-seems-high sentences is created by movement (Larson 1985). Moreover, there are scope facts also observed by Larson that pose difficulty to an analysis involving only ellipsis.

The rest of this paper presents the other three empirical generalizations and argues for a combined analysis involving both movement of *either* and ellipsis. Section 2 will discuss the island facts, and argue that covert movement of *either* derives *either*-seemslow sentences. This covert movement is subject to island constraints as well. Section 3 will discuss the scope observations. Section 4 concludes the paper.

2. Island sensitivity

As mentioned, there is evidence that *either*-seems-high sentences are created by ellipsis, but ellipsis alone is not sufficient. This section argues for the need to posit movement of *either* by showing that the position of *either* is sensitive to islands.

Before presenting actual data, I will present the logic of the argument. As Larson (1985) has observed, *either* cannot be separated from the apparent DisjP by an island in *either*-seems-high sentences:

Adopting the view that *either*-seems-high sentences involve ellipsis, the island facts really indicate that *either* in Spec, DisjP cannot be above an island. In other words, no island may intervene between the left periphery of DisjP and *or*:

(11) *... either [
$$_{DisjP}$$
 ... [$_{island}$... or ...]]

If we posit movement of *either* from somewhere inside the DisjP to the sister of DisjP, the island facts can be understood as the banal restriction that the movement of *either* may not cross an island. This is what I will argue for in this section.

(12) *... either_i [
$$DisjP$$
 ... [$island$... t_i ... or ...]]

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Now I will present the actual facts. First, we observe that *either* in *either*-seems-high sentences cannot be separated from the apparent DisjP by a complex NP boundary, an adjunct clausal boundary or negation, as (13), (14) and (15) show respectively.²

- (13) Either and the apparent DisjP can't be separated by a complex NP boundary:
 - a. *Either John revised [NP his decision to eat rice] or beans.
 - b. *John either revised [NP his decision to eat rice] or beans.
 - c. *John revised either [NP his decision to eat rice] or beans.
 - d. John revised [NP his decision to **either** eat rice] or beans. (Larson 1985)
- (14) Either and the apparent DisjP can't be separated by an adjunct clausal boundary:
 - a. *Either John went home [AdiP after eating rice] or beans.
 - b. *John either went home [AdiP after eating rice] or beans.
 - c. John went home [AdiP after either eating rice] or beans.
- (15) Either and the apparent DisjP can't be separated by negation:
 - a. ??**Either** John [NegP didn't try to eat rice] or beans.
 - b. ??John either [NegP didn't try to eat rice] or beans.
 - c. John [NegP didn't try to either eat rice] or beans.

(Larson 1985)

Complex NP and adjunct clauses are islands to movement. And if *either* is not nominal, negation should also be an island to its movement too. Examples (13), (14) and (15) therefore suggest that *either* in *either*-seems-high sentences is created by movement. Specifically, *either* has moved from somewhere inside the DisjP to Spec, DisjP:

(16) *... [DisjP Either_i [Disj', [island [A
$$t_i X ...$$
] or [B $X ...$]]]

If *either* moves, then a natural prediction is the following: not only is the *derived* position of *either* banned *above* an island boundary, but its *base* position should be banned *below* an island boundary as well.

Now imagine that movement of *either* can be either overt or covert. When it moves overtly, we get *either*-seems-high sentences. When it moves covertly, we get *either*-seems-low-sentences.

Then *either*-seems-low sentences can be the test ground for the above prediction. In these sentences *either* surfaces in the base position, so we predict that *either* in *either*-seems-low sentences must not be embedded in an island.

An acceptability judgment survey conducted by Hofmeister (2010), however, indicates no significant difference between the judgment of the high positions of *either* above C and the lower positions below C. These positions are considered to be equally good, which suggests that the restriction on the clause-boundedness of high *either* may not be correct. Therefore, I do not list it as a restriction here.

² It has also been noted in the literature (e.g. Larson 1985 and den Dikken 2006) that *either* cannot be separated from the apparent DisjP by a finite clause boundary (*either* occurs in one of the bracketed positions):

⁽i) <??Either> he <??either> said <%either> that <either> he <either> would <either> eat <either> rice or beans.

This prediction is borne out: *either* in *either*-seems-low sentences may not contained within a complex NP boundary, adjunct clausal boundary or negation:

- (17) *Either* can't be below a complex NP boundary in *either*-seems-low sentences: a. *John revised [NP his decision to **either** eat rice] or he revised his decision to eat beans.
 - b. *John revised [NP his decision either to eat rice] or he revised his decision to eat beans.
 - c. John **either** revised [NP his decision to eat rice] or he revised his decision to eat beans. (den Dikken 2006)
- (18) *Either* can't be below an adjunct clausal boundary in *either*-seems-low sentences: a. *John went home [AdjP after **either** eating rice] or he went home after eating beans.
 - b. John **either** went home [AdjP after eating rice] or he went home after eating beans.
- (19) *Either* can't be below negation in *either*-seems-low sentences:
 - a. *John [NegP wasn't eating either rice] or he wasn't eating beans.
 - b. *John [NegP wasn't either eating rice] or he wasn't eating beans.
 - c. John **either** [NegP wasn't eating rice] or he wasn't eating beans.

(den Dikken 2006)

The distribution of *either* in *either*-seems-high sentences is mirrored by the distribution of *either* in *either*-seems-low sentences. While *either* may not appear *above* an island boundary in *either*-seems-high sentences, it may not appear *below* an island boundary in *either*-seems-low sentences.

This fact follows from the movement of *either*. *Either* in *either*-seems-high sentences is in the derived position, so it cannot appear above an island boundary.³ *Either* in *either*-seems-low sentences is in the base position, so it cannot appear below an island boundary:⁴

(20) *... either_H ... [
$$_{island}$$
 ... either_L]

³ Since I assume that *either*-seems-high sentences involve ellipsis, one may entertain the possibility that the apparent island effects in *either*-seems-high sentences are not a result of the movement of *either*, but due to a restriction on ellipsis: this ellipsis cannot delete island boundaries. While this may be true, it is the *either*-seems-low sentences that really show the need to posit the movement of *either*. The account involving only ellipsis does not work there because nothing can be elided in *either*-seems-low examples.

⁴A natural question to ask next is why *either* moves. In work in progress, I argue that this movement is triggered by agreement with the disjunction head. In response to the probing disjunction head, *either* moves to Spec, DisjP and agrees with it. There is morphological evidence for this agreement relation. In the negative version (*neither...nor...*), spreading of the negative feature to both disjunction coordinators *neither* and *nor* suggests that they do share features. I remain agnostic about whether *or* itself is the disjunction head, or whether there is another covert disjunction head that agrees with both *either* and *or*. What is important is that *neither* and *nor* do share negative morphological features, which is a byproduct of their agreement with each other or their agreement with the disjunction head.

One may wonder if *either*'s movement violates the coordinate structure constraint (CSC). CSC bans nonparallel extraction from only one of the coordinates. One may thus think of the coordinate structure itself as an island (21a). Adopting this view, crucially movement that stays *inside* the coordinate structure does *not* offend CSC. Movement of *either* precisely stays within the DisjP: *either* moves not out of DisjP, but to Spec, DisjP (21b).

(21) a. *
$$XP_i$$
 ... [D_{isjP} [A ... t_i ...] or [B ...]] b. ... [D_{isjP} either; [D_{isj} , [A ... t_i ...] or [B ...]]]

3. Scope

This section presents the observations about scope, and shows that the two components to my proposal, ellipsis and movement, together can account for them. I will first discuss the observation by Larson (1985) that *either* marks scope in *either*-seems-high sentences, which follows from the ellipsis analysis. Then I will discuss the observation that *either*-seems-normal sentences are ambiguous. To account for this fact, we need both ellipsis and movement of *either*.

To begin, it is useful to know how to detect the scope of disjunction. Rooth and Partee (1982) have observed that (22) has at least three readings, two of which are relevant to the current discussion:

(22) Sherlock is looking for a burglar or a thief.

Reading 1: Sherlock is looking for a criminal and would be satisfied with any individual x meeting the description "x is a burglar or x is a thief"

Reading 2: Either one of two things is happening: (1) Sherlock is looking for a burglar; or (2) Sherlock is looking for a thief.

Reading 2 is significant because in this reading, the disjunction links two TP clauses, *Sherlock is looking for a burglar or Sherlock is looking for a thief.* This disjunction is larger than what is apparently disjoined in (22), i.e. a disjunction of two DPs, *a burglar or a thief.* For this reason, they call Reading 2 the *wide scope reading* of disjunction.

Note that these two readings differ in the scope of disjunction relative to the scope of the intensional verb *looking for*. These readings can be described in terms of the relation between the scope of disjunction and the scope of *looking for*. Because in reading 1 the scope of disjunction is lower than that of *looking for*, I call it the *narrow scope reading* of disjunction:

(23) Sherlock is looking for a burglar or a thief.

Reading 1 (narrow scope of disjunction): looking for > DisjP

Reading 2 (wide scope of disjunction): DisjP > looking for

Having defined the scope of disjunction, let me add to the discussion the generalization that *either* marks the scope of disjunction in *either*-seems-high sentences but not in *either*-seems-normal sentences (Larson 1985).

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It has been observed that among the three readings of the *either*-seems-normal sentence (24), its *either*-seems-high counterparts (25a) and (25b) only have the reading where the scope of disjunction coincides with *either*'s surface position:

- Sherlock pretended to be looking for either a burglar or a thief. (3 readings)
 <u>Reading 1</u> (pretended > looking for > DisjP): Sherlock pretended to be looking for someone who is either a burglar or a thief.

 <u>Reading 2</u> (pretended > DisjP > looking for): Sherlock pretended to do one of two things: (1) be looking for a burglar; or (2) be looking for a thief.
 <u>Reading 3</u> (DisjP > pretended > looking for): One of two things happened: (1) Sherlock pretended to be looking for a burglar; or (2) Sherlock pretended to be looking for a thief.
- (25) a. Sherlock pretended to be either looking for a burglar or a thief. Reading 2 only (pretended > DisjP > looking for)
 - b. Sherlock either pretended to be looking for a burglar or a thief. Reading 3 only (DisjP > pretended > looking for)

Looking at (25a,b) first, their frozen scope follows from the conclusion reached earlier that *either*-seems-high sentences involve ellipsis. Once the elided material is recovered, we get the corresponding reading of each sentence. (26a) recovers the elided material in (25a). The actual DisjP is *either*'s sister, i.e. *looking for a burglar or looking for a thief*, which is exactly the intermediate scope of disjunction we get. Likewise, once the elided material is recovered for (25b), we get the corresponding wide scope reading (26b).

a. Sherlock pretended to be either looking for a burglar or looking for a thief.
b. Sherlock either pretended to be looking for a burglar or pretended to be looking for a thief.

Therefore, the scope of disjunction is the actual disjunction once we recover the elided material. Because in *either*-seems-high sentences *either* is the sister of the actual DisjP, and the actual DisjP is the scope of disjunction, *either* marks the scope indirectly by being the sister of the scope of disjunction.

Having explained the fixed scope of *either*-seems-high sentences, let us now examine the *either*-seems-normal sentence in (24). I argue that its ambiguity results from the movement of *either*. Because *either* can move overtly or covertly, *either* in (24) is ambiguous between *either* pronounced in its derived position and *either* pronounced in its base position. If *either* is pronounced in its derived position in (24), its sister, *a burglar* or a thief, is the actual DisjP and the scope we get (27a). If *either* moves covertly, then the sister of its unpronounced copy is the actual DisjP. If that unpronounced copy is between *pretended* and *looking for*, we get the intermediate scope (27b); if it is above *pretended*, we get the wide scope (27c).

- (27) a. Sherlock pretended to be looking for **either** [DisjP a burglar or a thief].
 - b. Sherlock pretended to be either_i [DisjP looking for either_i a burglar or looking for a thief].
 - c. Sherlock either: [DisjP pretended to be looking for either: a burglar or pretended to be looking for a thief].

Once we consider the movement of *either*, we may return to the *either*-seems-high sentences and ask why *either* in those sentences cannot be a low copy, i.e. why it cannot move covertly. Specifically, recall the *either*-seems-high sentence (25a) with only the intermediate scope of disjunction. Why can't the following be a derivation of (25a), which would incorrectly predict that it also has reading 3, wide scope of disjunction?

(28) Either Sherlock pretended to **either** be looking for a burglar or he pretended to be looking for a thief.

I argue that the following restriction on ellipsis rules out this derivation. In order for ellipsis to apply, there must be an antecedent (A) identical to the elided phrase (E):⁵

(29)
$$\left[\text{DisjP} \left[\text{Disjunct} \left[A \ldots \right] \ldots \right] \text{ or } \left[\text{Disjunct} \left[E \ldots \right] \ldots \right] \right]$$

This identity condition interacts with a peculiar property of *either...or...* sentences, namely there is only one *either* present inside a DisjP. Furthermore, this *either* must be in the first disjunct, and cannot be in the noninitial disjuncts (see footnote 1). Because the elided phrase is in the noninitial disjunct, it must contain no *either*. Then in order to be identical, its antecedent must not contain *either*. Thus, the generalization is that ellipsis can only apply if *either* is not in the antecedent:

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(30) a. [DisjP [Disjunct either [A ...] ...] or [Disjunct [E ...] ...]] b. [DisjP [Disjunct [A ...] either ...] or [Disjunct [E ...] ...]] c. *[DisjP [Disjunct [A ...either ...] ...] or [Disjunct [E ...] ...]]
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Therefore, in order for ellipsis to apply, we must get *either* out of the antecedent. The unacceptable derivation in (28) fails to do this.

Before delving into the analysis, I will make an explicit assumption about what this ellipsis looks like. It involves the following two steps. First, the remnant that survives ellipsis moves out of the elided phrase E. Next, phrasal ellipsis applies to E.⁶

Now I will illustrate how (28) fails to get *either* out of the antecedent. In order to elide *he pretended to be looking for*, the elided phrase must be the whole TP *he pretended to be*

⁵ It does not matter to the analysis whether identity must hold between syntactic representations of constituents or semantic representations. Either a syntactic notion of identity or a semantic notion can work.

⁶ This two-step process of ellipsis is only assumed for the ease of illustration and is not necessary for the analysis to go through. A different assumption about this ellipsis would be compatible with the analysis as long as it requires the antecedent to be identical to the elided phrase, and presence of *either* in the antecedent disrupts this identity.

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looking for a thief. Its antecedent must therefore be the corresponding TP in the first disjunct *he pretended to be looking for a burglar*:

(31) Either_k [A Sherlock pretended to **either**_k be looking for a burglar] or [E he pretended to be looking for a thief].

We must move the remnant that survives ellipsis out of E, and its correspondent *a burglar* must also evacuate A:

(32) Either_k [A Sherlock pretended to **either**_k be looking for t_j] [a burglar]_j or [E he pretended to be looking for t_i] [Remnant a thief]_i.

Notice that A and E are not identical because A has *either* but E does not.⁷ This blocks ellipsis.

All the acceptable *either*-seems-high sentences that do involve ellipsis avoid this problem by maintaining parallelism between A and E. Due to the space limit, I omit the verification of parallelism for these *either*-seems-high sentences.

There is another possible ellipsis case we have not examined yet. Ellipsis creates ambiguity for *either*-seems-normal sentences. Recall that in order for disjunction to scope above *either*'s surface position, *either* must move covertly. I repeat (27b,c) below:

- (33) a. Sherlock pretended to be either_i [DisjP looking for either_i a burglar or looking for a thief].
 - b. Sherlock either_i [DisjP pretended to be looking for **either**_i a burglar or pretended to be looking for a thief].

How do these sentences manage to get *either* out of A? The answer is that *either* starts out in A, but escapes A later by "piggy-backing" on the constituent that moves out of A. Here is what this means. Take (33a) as an example. In order to elide *looking for*, E has to be at least the VP *looking for a thief*, so A is *looking for a burglar*. As we move the remnant *a thief* out of E, its correspondent *a burglar* also moves out of A. Crucially, *either* by virtue of being the sister of *a burglar*, manages to "piggy-back" on its movement and escape A:

(34) Sherlock pretended to be [A looking for t_j] [DP **either** a burglar] $_j$ or [E looking for t_i] [Remnant a thief] $_i$.

Now that A and E are identical, ellipsis can apply:

For this reason I have focused on the base position of either, and ignore the fact that it moves later.

⁷ One may wonder if it matters that *either* in A later moves to Spec, DisjP. It does not, as the presence of the trace of *either* still makes A and E nonidentical:

⁽i) Either_k [A Sherlock pretended to t_k be looking for t_j] [a burglar]_j or [E he pretended to be looking for t_i] [Remnant a thief]_i.

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(35) Sherlock pretended to be [A looking for t_j] [DP **either** a burglar]_j or [E looking for t_i] [Remnant a thief]_i.

Thus, we have seen that ambiguity arises in *either*-seems-normal sentences because *either* can escape from A by "piggy-backing" on the movement of its sister.

4. Conclusion

In this paper I have mentioned four empirical generalizations that motivate both ellipsis and movement of *either* in *either...or...* sentences. Verb-particle constructions suggest that ellipsis can occur, and island facts suggest that *either* moves. Covert movement of *either* derives *either*-seems-low sentences, and a combination of ellipsis and movement of *either* derives the observations about scope.

This proposal has some remaining questions. For instance, it claims that it is truly optional whether *either* moves overtly or covertly. This does not seem to be the case with many other attested movements. Movement of the first *wh*-phrase in English, for example, is always overt, whereas *wh*-movement in Japanese is always covert. I will leave it to future research what conditions the overtness vs. covertness of movement in a given language.

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