The proper treatment of the wide scope *or* reading of the English *either … or …* construction[1]

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Abstract. The main concern of this paper is the availability of the wide scope *or* reading in the English *either … or …* construction and its interaction with the behavior of *either*. I propose that a hybrid analysis consisting of an ellipsis analysis (Schwarz, 1999), which directly arises from the requirement of *or* that it connect disjuncts of the same type, and a choice function analysis of *either* (cf. Winter (2001); Schlenker (2006) for a choice function analysis of *or*) explains the whole data set. I also discuss a prediction the present analysis makes and some remaining issues, including a data issue in which the judgments made by my informants differ from the ones observed in a previous study.

Keywords: disjunction, wide scope *or* reading, choice function, ellipsis.

1. Introduction

This paper focuses on the English *either … or …* construction, in which *either* can be overt or covert as presented in Larson (1985):

(1) a. Mary is looking for a maid or a cook.
     b. Mary is looking for either a maid or a cook.   (Larson, 1985: 218)

The proposal of this paper is that a hybrid analysis consisting of a choice function analysis of *either* (cf.Winter (2001); Schlenker (2006) for a choice function analysis of *or*) and an ellipsis analysis (Schwarz, 1999) straightforwardly explains the basic data concerning the (un)availability of the wide scope *or* reading.

The rest of the paper is organized as follows. In Section 2, I review the basic data set of the availability of the wide scope *or* reading and its interaction with *either*. The main proposal is given in Section 3, where it is shown that neither a pure ellipsis analysis nor a pure choice function analysis explains the data set in Section 2. I propose that a hybrid analysis which combines the ellipsis analysis and a choice function analysis of *either*, a modified version of the choice function analysis of disjunction, covers the whole data set introduced in Section 2. Section 4 concludes the paper and discusses some potential problems related to the predictions that the present analysis makes.

2. The basic data set

As noted in Partee and Rooth (1983) as a problematic case and discussed in Rooth and Partee (1982) in more detail, when disjunction is combined with certain kinds of elements in a sentence, the sentence is (at least) three-ways ambiguous:

(2)   The department is looking for a phonologist or a phonetician. (Partee and Rooth, 1983: 374)

     a. $[\![$look for$]\!]([\![$a phonologist or a phonetician$]\!])$ (d) (narrow scope *or de dicto* reading)

     b. $\exists x : [\![$a phonologist or a phonetician$]\!](x), [\![$look for$]\!]$ (x) (d)   (*de re* reading)

     c. $[\![$look for$]\!]([\![$a phonologist$]\!])$ (d) $\vee [\![$look for$]\!]([\![$a phonetician$]\!])$ (d)   (wide scope *or de dicto* reading)

There is a *de re* reading in (2b) according to which there is a specific person x who is either a phonologist or a phonetician, and the department is looking for him. (Since this reading does not affect the discussion in this paper, I disregard this reading hereafter.) The narrow scope *or de dicto* reading (the NS reading) is in (2a), and under this reading the department would be satisfied by finding either a phonologist or a phonetician. The "problematic" *de dicto* reading, which I am interested in, is described in (2c). On this reading, the department do not yet necessarily have a specific candidate in mind. They do already have in mind which of the two specialists they are going to look for, but the speaker forgot which it was. The reading becomes clearer when continued with ". . . but I don't know which." Thus the overall meaning is as if the disjunction is connecting two propositions, taking widest scope, even though the indefinite in each disjunct takes narrow scope. This is called the "wide scope *or*" reading (the WS reading) in Rooth and Partee (1982).

Larson (1985) observes that the possible readings of a sentence change when *either* comes into the structure. He states a generalization:

(3)   Larson's (1985) generalization (Winter, 2000: 395):

     a.   In *or* coordinations without *either*, as well as in *either . . . or . . .* coordinations with *either* undisplaced, the scope of *or* is confined to those positions where *either* can potentially appear.

     b.   When *either* is displaced it specifies the scope of *or* to be at that displaced position.

Thus, while when *either* is adjacent to the Disjunction Phrase both NS and WS readings are available (4), when *either* floats to a higher position the NS reading disappears (5).

(4)   a.   Mary is looking for a maid or a cook.

     b.   Mary is looking for either a maid or a cook.

        (i) $[\![$look for$]\!]([\![$a maid or a cook$]\!])(m)$ (NS reading)

        (ii) $[\![$look for$]\!]([\![$a maid$]\!])(m) \vee [\![$look for$]\!]([\![$a cook$]\!])(m)$ (WS reading)

(5)   a.   Mary is either looking for a maid or a cook.

     b.   Mary either is looking for a maid or a cook.

    c.   Either Mary is looking for a maid or a cook.

        (i) ?*⟦look for⟧(⟦a maid or a cook⟧) (m)   (NS reading)

        (ii)   ⟦look for⟧(⟦a maid⟧)(m) ∨ ⟦look for⟧(⟦a cook⟧) (m)   (WS reading)

Winter (2000) and Schlenker (2006) report data which at first glance look like an exception to Larson's (1985) generalization in (3), where disjunction can take wide scope over an island as in (6) and (9) but *either* cannot appear out of the island as in (8) and (11).[2] Note that *either* can appear inside the island and the disjunction can take either the narrow or wide scope as shown in (7) and (10).

(6)   If Bill praises Mary or Sue then John will be happy.   (Winter, 2000: 403)

     a.   If Bill praises Mary then John will be happy and if Bill praises Sue then John will be happy. (NS)

     b.   If Bill praises Mary then John will be happy or if Bill praises Sue then John will be happy. (WS)

(7)   a.   If Bill praises either Mary or Sue then John will be happy. (^{OK} NS / ^{OK}WS)

     b.   If Bill either praises Mary or Sue then John will be happy. (^{OK} NS / ^{OK}WS)

(8)   *Either if Bill praises Mary or Sue then John will be happy.   (Winter, 2000: 403)

(9)   Students taking the exam have a choice of two options: Greek or Latin.

     a.   Not a single student who picked some/a certain option (I don't remember which) passed the exam. (baseline; island-escaping indefinites)

     b.   #Not a single student who picked at least one option (I don't remember which) passed the exam. (baseline; non-island-escaping indefinites)

     c.   Not a single student who picked Greek or Latin (I don't remember which) passed the exam.

(10)   a.   Not a single student who picked either Greek or Latin (I don't remember which) passed the exam.

      b.   ?Not a single student who either picked Greek or Latin (I don't remember which) passed the exam.

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[2]Larson, 1985: 245 reports that the scope of *or* actually is sensitive to CNP islands and *Wh* islands when *either* is not present as in (i) and (ii) (according to his claim, movement of the null operator in the position of *either* is sensitive to islands). Thus there seems to be a discrepancy in judgment.

(i)   John maintains the claim that Bill should resign or retire.

     a.   John maintains [SHOULD (resign (b)) ∨ SHOULD (retire (b))]

     b.   *John maintains [SHOULD (resign (b))] ∨ John maintains [SHOULD (retire (b))]

(ii)   John knows who should resign or retire.

     a.   John knows *p*, where *p* is true & ∃x [*p* = SHOULD (resign (x)) ∨ SHOULD (retire (x))]

     b.   ??[John knows *p*] ∨ [John knows *q*], where *p* is true & ∃x [*p* = SHOULD (resign (x))], and where *q* is true & ∃x [*q* = SHOULD (retire (x))]

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(11)   *Either not a single student who picked Greek or Latin passed the exam. (Schlenker, 2006: 306)

The fact that sentences with *either* inside an island do have WS readings ((7), (10)) conforms to the generalization in (3a), since sentences with *either* in its base position can have the scope of *or* higher than the surface position of *either*. In contrast, it goes against the generalization in (3b), since floated *either* does not mark the exact scope of *or* but allows the scope of *or* to be in a higher position.

In this section we have seen Larson's (1985) generalization in (3), in which it is stated that (i) in sentences with no *either* or with *either* in its base position, *or* can take both the narrow scope and the wide scope, while (ii) in sentences with floated *either*, only the WS reading is available. We have also seen data reported by Winter (2000) and Schlenker (2006), in which *or* can take scope over an island but *either* cannot overtly appear outside the island. In the next section, we will see that a hybrid analysis, which combines Schwarz's (1999) ellipsis analysis and a version of a choice function analysis that slightly modifies a choice function analysis for disjunction suggested in previous studies, explains the data in this section neatly.

3. Proposal: A hybrid analaysis

In this section, I introduce two previous analyses on the *either . . . or . . .* construction: the ellipsis analysis (Schwarz, 1999) and the choice function analysis of *or* (Winter, 2001; Schlenker, 2006). It is shown that although both analyses have advantages, they also have problems. I propose that the hybrid analysis which combines the two analyses with some modification covers the data set introduced in Section 2: (i) the ellipsis treatment of disjunction, which comes from the semantic requirement on *or* that it has to take two disjuncts of the same semantic type, explains the obligatory WS reading of the "floated *either*" sentences in (5), and (ii) the choice function analysis of *either*, which is a modified version of the choice function analysis of *or*, explains the ambiguity of sentences with no *either* or with *either* in its base position (4).

3.1. The ellipsis analysis

The ellipsis analysis of Schwarz (1999) claims that "unbalanced disjunction" as in (12), in which in the surface form the disjuncts are not the same size under the assumption that the overt position of *either* marks the left edge of the first disjunct, is derived by ellipsis. The analysis correctly predicts that when *either* floats only the WS reading is available, since the underlying form involves balanced disjunction and directly corresponds to the WS reading.

(12)   a.   John either ate rice or beans.
                John either [$_{VP}$ ate rice] or [$_{VP}$ ~~ate~~ beans]
         b.   Either John ate rice or beans.
                Either [$_{IP}$ John ate rice] or [$_{IP}$ ~~John ate~~ beans]   (Schwarz, 1999: 351-352)

The ellipsis analysis can also explain the fact that the size of the second disjunct can be smaller

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than the first one (13a) while the size of the first disjunct cannot be smaller than the second one (13b).

(13)   a.   *either [X_t or Y_τ] (where τ is any semantic type)*
               Mary is either looking for a maid or a cook.
               Mary either is looking for a maid or a cook.
               Either Mary is looking for a maid or a cook.
    b.   *either [X_t or Y_τ] (where $\tau \neq t$)*
               #Mary is either a maid or looking for a cook.
               *John either Mary or saw Sue.

The ellipsis analysis is able to handle this fact since ellipsis is sensitive to the linear order of the elements under consideration. Specifically, ellipsis is applied to the second (non-initial) element, under identity of the deleted element with the initial element. Thus when the size of the second disjunct is smaller than the first one (13a), it is possible to assume that there is some elided material for the second disjunct, while when the size of the first disjunct is smaller than the second one (13b), we cannot claim that the first disjunct has undergone ellipsis, since ellipsis cannot be applied to the initial element. We successfully account for the difference in the acceptability between (13a) and (13b).[3]

Next, let me closely examine the nature of the ellipsis operation that is involved in deriving unbalanced disjunction. Specifically, I will examine whether the proposal can explain data beyond the simplest ones like (12), namely sentences such as (13).

(14)   John either cited a theory that Partee or Rooth invented.

(14) is an example of unbalanced disjunction which involves a Complex NP Island. According to the ellipsis analysis, its structure is as in (15), based on the assumption that unbalanced disjunction has a balanced structure in its underlying form. The surface form in (14) is derived by (i) eliding the embedded verb in the first disjunct and (ii) eliding everything but the embedded subject and verb in the second disjunct, as shown in (15). In the rest of this subsection, I investigate whether such a derivation is really possible.

(15)   John either [cited a theory that Partee ~~invented~~] or [~~cited a theory that~~ Rooth invented].

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[3]Note that the ellipsis analysis have difficulty in accounting for the data of "R-*either*" in Den Dikken (2006), in which *either* seems to be "buried" inside the first disjunct.

(i)   John either ate rice or he ate beans.   (Den Dikken, 2006: 690)

Larson (1985), who proposes a movement analysis of *either*, claims that sentences like (iia) involve an unbalanced disjunction of VP and CP as in (iib). The matrix subject moves out from the first disjunct and *either*, originally inside the DisjP, optionally moves leftwards.

(ii)   a.   Mary either is driving to the airport or she is taking a cab.
        b.   Mary$_j$ either$_i$ is [$_{DisjP}$ t_i or [$_{VP}$ t_j driving to the airport] [$_{CP}$ she is taking a cab]].

Going back to the original argument of the ellipsis analysis proposed by Schwarz (1999), Schwarz (1999) claims that the ellipsis operation involved in the derivation of unbalanced disjunction (17) is in fact Gapping (16).

(16)   Tom has a pistol and Dick ~~has~~ a sword.

(17)   a.   John either ate rice or ~~ate~~ beans.
        b.   Either John ate rice or ~~John ate~~ beans.   (Schwarz, 1999: 351-352)

As supporting evidence, he observes that Gapping and unbalanced disjunction behave similarly. For one thing, Gapping always targets the finite verb of the second conjunct, and sometimes extra material too, including subjects as in (18). This parallels the unbalanced disjunction data in (17).

(18)   On Monday I bought a car and on Tuesday ~~I bought~~ a motorcycle. (Schwarz, 1999: 354)

For another, it is possible for Gapping to leave only one expression as in (19). This behavior also parallels (17).

(19)   John bought a book yesterday, and a newspaper.   (Schwarz, 1999: 354)

An important characteristic that Gapping and unbalanced disjunction have in common is that neither of them allows "dangling remnants," where the first and second conjuncts/disjuncts are not parallel. In both (20) and (21), the second conjunct/disjunct has some extra material that the first conjunct/disjunct does not, and this leads to the degraded status of the sentences.

(20)   *Some talked about politics and others ~~talked~~ with me about music.
        (Schwarz, 1999: 356)

(21)   a.   ?Either [he invited you] or [~~he invited~~ me to a party].
        b.   ??Either [this pissed Bill] or [~~this pissed~~ Sue off].   (Schwarz, 1999: 357)

According to Schwarz (1999), the reason why the sentences in (21) are less degraded than (20) is because what is prohibited from being left as a "dangling remnant" can be Right Node Raised from both the first disjunct and the second disjunct. Right Node Raising must take place in a disjunct-final position as in (21), thus having no ameliorating effect on (20) since the "dangling remnant" there is in a medial position.

Now let us return to (14) and see whether the derivation (15) is a possible one.

(14)   John either cited a theory that Partee or Rooth invented.
(15)   John either [cited a theory that Partee ~~invented~~] or [~~cited a theory that~~ Rooth invented].

As stated earlier, the surface form in (14) is derived by (i) eliding the embedded verb in the first disjunct and (ii) eliding everything but the embedded subject and verb in the second disjunct, as shown in (15). The second step, namely the deletion of elements in the second disjunct, can be explained with Gapping, given that Gapping can potentially leave only one element as in (19) and, in addition, the least embedded verb can potentially be the only material elided. In fact, as laid out in Johnson (2006) in detail, Gapping cannot target an embedded verb excluding the matrix verb as in (22), following the No Embedding Constraint (23).

(22)   *Alfonse stole the emeralds, and I think that Mugsy ~~stole~~ the pearls. (Johnson, 2006: 412)

(23)   The No Embedding Constraint (Johnson, 2006: 412)
        Let A and B be conjoined or disjoined phrases, and β be the string elided in B whose antecedent is α in A. Then α and β must contain the highest verb in A and B.

The first step of deriving (14), namely eliding the embedded verb in the first disjunct, is also accounted for by claiming that the embedded verb, which is the rightmost element in the first disjunct, undergoes Right Node Raising. The claim is consistent with the observation that Right Node Raising has to target the conjunct/disjunct-final element as in (21). Furthermore, the data conform to the classic claim that Right Node Raising has to target constituents (cf. Postal (1974); Bresnan (1974) among others), which is shown by the contrast between (24a) and (24b). As can be observed from the difference in acceptability between (24a,b) and (25c), the elided material in the first disjunct in unbalanced disjunction also has to form a constituent as in (24a,b) and the sentence is degraded when it is not a constituent as in (25c).

(24)   a.   He tried to persuade them, but he couldn't convince them, that he was right.
        b.   *He tried to persuade, but he couldn't convince, {them / the students} that he was right.   (Bresnan, 1974: 615)

(25)   a.   John either thinks that Mary talked yesterday ~~with Sue~~ or ~~thinks that Mary talked~~ today with Sue.
        b.   John either thinks that Mary talked yesterday ~~about music~~ or today about music.
        c.   ??John either thinks that Mary talked yesterday ~~with Sue about music~~ or today with Sue about music.

Now it has been shown that the ellipsis analysis of unbalanced disjunction, claimed to involve Gapping and Right Node Raising according to Schwarz (1999), successfully derives sentences like (14) with the underlying structure (15). I thus adopt the ellipsis analysis to account for the unbalanced disjunction examples. Further, to ensure that *either* occurs with *or*, I claim that *either* is syntactically required to take a DisjP as its argument and *or* inside the DisjP has to take two disjuncts of the same type/size (cf. Law of coordination of likes), thus motivating the ellipsis treatment when the surface form is unbalanced.

However, even though the ellipsis analysis explains very well the unbalanced disjunction data, it has a crucial problem that it does not have much to say about the availability of the WS

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reading for sentences with *either* in its base position, adjacent to the DisjP. Recall that such sentences are ambiguous, having both NS and WS readings, as we have seen in (4) in Section 2.

(26) a.   Mary is looking for a maid or a cook.
      b.   Mary is looking for either a maid or a cook.
           (i) $[\![\text{look for}]\!] ([\![\text{a maid or a cook}]\!]) (m)$ (NS reading)
           (ii) $[\![\text{look for}]\!] ([\![\text{a maid}]\!])(m) \vee [\![\text{look for}]\!] ([\![\text{a cook}]\!]) (m)$ (WS reading)

In such "balanced disjunction" examples, there is no motivation to posit ellipsis in the derivation of the sentences, and thus in the ideal case, ellipsis would not be involved in the derivation of these sentences. Thus the ellipsis analysis predicts that only the NS reading is possible. The ellipsis analysis on its own leaves unexplained the problem of the ambiguity of the sentence when *either* is in its base position.[4]

It is precisely this problem that the choice function analysis readily explains. I next turn to the details of the choice function analysis.

3.2. The choice function analysis of disjunction

In this section, I review the choice function analysis of disjunction suggested in Winter (2001) and Schlenker (2006). It is shown that the analysis can explain the ambiguity that sentences with *either* in its base position and the fact that the WS reading is available in sentences with the disjunction in an island. Winter (2001) suggests a (Skolem) choice function analysis for disjunction and claims that through existential closure over the choice function variable that the disjunction introduces, we obtain the WS reading as in (27).[5] This is basically applying the choice function analysis that he proposes for indefinites to disjunction.

(27) If Bill praises Mary or Sue then John will be happy.
      $\exists f[\text{CH}(f) \wedge [\langle \ \rangle^d (min(M \cup S))(\lambda x.\text{praise}'(x)(b') \rightarrow \text{happy}'(j'))]]$
      $= \exists f[\text{CH}(f) \wedge [\langle \ \rangle^d (\{\{m'\}, \{s'\}\})(\lambda x.\text{praise}'(x)(b') \rightarrow \text{happy}'(j'))]]$
      $= \exists A \in \{\{m'\}, \{s'\}\}[(\lambda P.A \subseteq P)(\lambda x.\text{praise}'(x)(b') \rightarrow \text{happy}'(j'))]$
      $= [\text{praise}'(m')(b') \rightarrow \text{happy}'(j')] \vee [\text{praise}'(s')(b') \rightarrow \text{happy}'(j')]$ (Winter, 2001: 159)

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[4]The fact that the ellipsis analysis predicts that *either* marks the exact scope of *or* becomes problematic again when we see data other than the basic ones in Section 4.

[5]*M* and *S* are the quantifiers corresponding to the proper names *Mary* and *Sue* respectively (and thus can be connected by Generalized Disjunction as in (27)) and the notations m′ and s′ are the lexical denotations of Mary and Sue respectively. The operator min (for the operation Minimum Sort) takes Q, a set of objects of type τ (which is a boolean type) and gives back the set of minimal sets of Q, where a set A is a minimal set of Q iff A is in Q and every proper subset of A is not in Q.

(i) $min = \lambda Q_{\tau t}.\lambda A_\tau.Q(A) \wedge \forall B \in Q [B \subseteq A \rightarrow B = A]$ (Winter, 2001: 53)

$\langle f \rangle^d$ is a distributive version of a choice function. The operator $\langle \ \rangle^d$ lifts a choice function with the following definition.

(ii) $\langle \ \rangle^d = \lambda g_{(ett)(et)}.\lambda A_{ett}.\lambda B_{et}. A \neq \emptyset \wedge g(A) \subseteq B$

Importantly, the choice function analysis has the obvious advantage that, since existential closure is not confined within islands, it successfully predicts the availability of the WS reading in sentences with no *either* or with *either* in its base position ((4), (6), (9)), even if the disjunction is inside an island. Furthermore, since existential closure can be applied to any node whose semantic type is *t*, the choice function analysis can account for the ambiguity that the sentences have; namely having both the NS and WS reading. Thus the choice function analysis neatly explains the ambiguity of sentences with no *either* or with *either* in its base position, which was a problem for the ellipsis analysis alone as we have seen in Section 3.1.

However, the choice function analysis has at least two problems. First, it has difficulty in deriving the WS reading for sentences with floated *either* since the analysis in itself does not have the machinery to derive the reading. In such sentences, the surface form is unbalanced disjunction, while the WS reading involves two propositional disjuncts as we can see from (5) repeated below.

(28) a. Mary is either looking for a maid or a cook.
     b. Mary either is looking for a maid or a cook.
     c. Either Mary is looking for a maid or a cook.
        (i) ?*$[\![$look for$]\!]([\![$a maid or a cook$]\!])$ (m)   (NS reading)
        (ii) $[\![$look for$]\!]([\![$a maid$]\!])$(m) $\vee$ $[\![$look for$]\!]([\![$a cook$]\!])$ (m)   (WS reading)

Second, the choice function analysis of disjunction has a problem in the mechanism used to determine the position of the choice function variable, and it becomes visible when we closely inspect the unbalanced disjunction example (28a). The problem is, the choice function analysis of disjunction actually does not rule out the possibility of the choice function variable being introduced at a position lower than is actually allowed. Since, according to the choice function analysis of disjunction, the only thing that the disjunction does is to require that the two disjuncts be of the same size and to introduce a choice function variable just outside the DisjP, there is no way to determine the size of the DisjP and the position where the choice function variable is introduced just from the role of the disjunction. Thus, for example, the choice function analysis of disjunction wrongly predicts that we can place the choice function variable just above *[a maid or a cook]* in (28a). The requirements of the disjunction are fulfilled in this situation, conjoining two disjuncts of the same size and placing the choice function variable above the DisjP. This results in the narrow scope reading of the disjunction, which the sentence does not have.

Thus a pure choice function analysis also have problems. In Subsection 3.3, I propose that we need to combine the choice function analysis with the ellipsis analysis in order to solve the first problem, and in addition, we need to modify the choice function analysis so that *either*, not *or*, introduces the choice function variable in order to solve the second problem.

3.3. The hybrid analysis

In previous subsections, I have shown that the ellipsis analysis and the choice function analysis of disjunction both have advantages and problems. The ellipsis analysis is able to account for the obligatory WS reading of floated *either* examples, but it cannot explain the availability of the WS reading in sentences with *either* in its base position. The choice function analysis of disjunction can explain the ambiguity of sentences with *either* in its base position, but lacks the machinery to derive the WS reading in floated *either* examples and overgenerates the NS reading.

Now we can see that the problem of the ellipsis analysis and the first problem of the choice function analysis of disjunction are solved if we combine the two analyses. The first version of the hybrid analysis, "the ellipsis analysis + the choice function analysis of disjunction," is given in (29). Below I give an overview of how the analysis can explain the basic data set. In sentences with no *either* or with *either* in its base position (30), where there is an ambiguity between narrow scope and wide scope *or*, no ellipsis is involved in the derivation of "balanced disjunction." Thus there are multiple possible positions for Existential Closure which correspond to the multiple possible scope positions of *or*.

(29)   The ellipsis analysis + the choice function analysis of *or*
    a.   *Either* syntactically requires a DisjP as its argument
    b.   *Or* semantically requires two disjuncts of the same semantic type
    c.   *Or* introduces a choice function variable

(30)   **Ambiguous between NS and WS *or***
    a.   Mary is looking for a maid or a cook.
    b.   Mary is looking for <u>*either*</u> a maid or a cook.
       ⇒ **No ellipsis / Multiple possible positions of Existential Closure**
       $[\exists f]$ Mary is looking for $[\exists f]$ PRO to FIND f($\{a\ maid, a\ cook\}$) (cf. Larson et al. (1997))
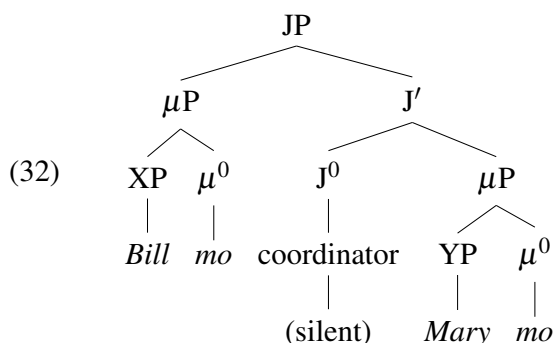
In sentences with floated *either* as in (31), where the WS reading is forced, *either* marks the left edge of the first disjunct and ellipsis is involved in the derivation. Since the choice function variable is introduced with the disjunction, Existential Closure is restricted to a position above the DisjP. Thus we can account for the fact that only the WS reading is available in the sentences.

(31)   **Unambiguous: only WS *or***
    a.   Mary is <u>*either*</u> looking for a maid or a cook.
    b.   Mary <u>*either*</u> is looking for a maid or a cook.
    c.   <u>*Either*</u> Mary is looking for a maid or a cook.
       ⇒ **Involve ellipsis / Existential Closure possible only above DisjP**
       a. Mary is <u>*either*</u> looking for a maid or ~~looking for~~ a cook.
       $\exists$f. Mary is f($\{looking\ for\ a\ maid, looking\ for\ a\ cook\}$)

b. Mary *either* is looking for a maid or ~~is looking for~~ a cook.
∃f. Mary f({*is looking for a maid, is looking for a cook*})
c. *Either* Mary is looking for a maid or ~~Mary is looking for~~ a cook.
∃f. f({*Mary is looking for a maid, Mary is looking for a cook*})

The first version of the hybrid analysis seems to explain well the data set in Section 2. However, the second problem of the choice function analysis of disjunction, namely the analysis predicts that a NS reading is available for the "floated *either*" examples, remains. This problem arises because we have assigned the role of introducing the choice function variable to the disjunction. This is the point where the analysis needs refinement. What, then, has the role of introducing the choice function variable? The obvious alternative candidate is *either*, and this indeed seems to be the right choice to make. Observe that, in all of the examples we have seen in (30) and (31), the position where the choice function variable is placed actually coincides with the overt position of *either*. Thus I propose that the item that has the role of introducing the choice function variable is *either*, rather than *or*, and argue for a choice function analysis of *either*.

As for the semantic role of *or*, I assume that *or* forms a set consisting of the disjuncts (cf. Alonso-Ovalle (2006)) that serves as the argument of the choice function variable. I adopt the claim made by Mitrović and Sauerland (2014) for the syntactic structure and the semantic computation inside coordination. Mitrović and Sauerland (2014) give a decomposed structure (32) for the Japanese phrase involving conjunction *Bill mo Mary mo* ''Bill and Mary.'

(32)

```
                    JP
               ┌────┴────┐
              μP         J′
            ┌──┴──┐    ┌──┴────┐
    (32)   XP   μ⁰    J⁰       μP
            │    │     │      ┌─┴─┐
          Bill  mo  coordinator YP  μ⁰
                       │        │    │
                    (silent)  Mary  mo
```

According to Mitrović and Sauerland (2014), languages can be classified into languages with an overt μ head such as Japanese *mo*, which can be used as a quantificational particle or a focus particle, and languages with an overt J(unction) head such as English *and*, which can be used when the coordinated items are individuals and when the coordinated items are propositions. The semantics of the two heads is as in (33).

(33)   a. $[\![\mu^0]\!](R_{<et>})(S_{<et>}) = R \subseteq S$
       b. $[\![J^0]\!](Q_{1<ett>})(Q_{2<ett>}) = Q_1 \cap Q_2$

With the help of the type-shifting operation from *e* to *et* at the XP/YP level, the individuals Bill and Mary are shifted to their characteristic properties and can combine with μ^0. The overall denotation of JP in (32) is thus the set {*Bill, Mary*}. Although the semantic difference between conjunction and disjunction needs to be clarified, I claim that the denotation of a DisjP is the

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set of the disjuncts and adopt the claim of Mitrović and Sauerland (2014) that the denotation can be derived compositionally.

Other elements of the hybrid analysis, namely (29a) and (29b), are carried over, so the final version of the hybrid analysis is as in (34). I also claim that even in sentences where *either* is covert, the presence of *or* indicates that a phonetically null version of *either* is present in the structure, thus ensuring that the possible readings are the same as for sentences with overt *either*.[6]

(34)   The ellipsis analysis + the choice function analysis of *either*
        a.   *Either* syntactically requires a DisjP as its argument (= (29a))
        b.   *Or* semantically requires two disjuncts of the same semantic type (= (29b))
        c.   *Either* introduces a choice function variable
        d.   *Or* semantically forms a set of the disjuncts that serves as the argument of the choice function variable

Below I show how interpretations are assigned for sentences with *either* in its base position (36) and with floated *either* (37). By claiming that *either* syntactically selects a DisjP and semantically introduces a choice function variable as in (35), we carry on the advantage of the choice function analysis and at the same time avoid the trouble of wrongly predicting a NS reading for the sentences in (31).

(35) $[\![either]\!]$ = f: f $\in$ D$_{cf}$
        (where f is a choice function Chf(f) iff for all P in dom(f): f(P) $\subseteq$ P)

(36)   Mary$_i$ is looking for [$_{TP}$ PRO$_i$ TO FIND [$_{XP}$ either [$_{DisjP}$ a maid or a cook]]].
        a. $[\![XP]\!] = [\![either]\!] [\![DisjP]\!]$
              = f ({a maid, a cook})
        b. $[\![TP]\!] = \lambda w.\exists f.$ Chf(f) & Mary to find f({a maid, a cook}) in w
        c. $[\![(36)]\!] = \lambda w'.$ Mary is looking for [$\lambda w.\exists f.$ Chf(f) & Mary to find f({a maid, a cook}) in w] in w'

(37)   Mary$_i$ is [$_{XP}$ either [$_{DisjP}$ looking for PRO$_i$ TO FIND a maid or ~~looking for PRO$_i$ TO FIND~~ a cook]].
        a. $[\![XP]\!] = [\![either]\!] [\![DisjP]\!]$
              = f ({$\lambda x.\lambda w'.$ x is looking for [$\lambda w.$ Mary to find a maid in w] in w', $\lambda x.\lambda w'.$ x is looking for [$\lambda w.$ Mary to find a cook in w] in w'})

---

[6]A point that needs explanation if we are to argue for the presence of covert *either*/Op is that in a question, the possible readings differ as to whether there is overt *either* or not. When there is no overt *either*, the sentence is ambiguous between an Alternative Question (AltQ) reading and a Yes/No Question (YNQ) reading as in (ia), while sentences with overt *either* only have the YNQ reading as in (ib) and (ic) (although there seems to be some speaker variation). I leave this problem for future research.

(i)   a.   Did Mary look for a maid or a cook? (AltQ / YNQ)
       b.   Did Mary look for either a maid or a cook? (*AltQ / YNQ)
       c.   Did Mary either look for a maid or a cook? (*AltQ / YNQ)

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b. $[\![(37)]\!] = \exists f.$ Chf(f) & f($\{\lambda x.\lambda w'.$ x is looking for $[\lambda w.$ Mary to find a maid in w] in w', $\lambda x.\lambda w'.$ x is looking for $[\lambda w.$ Mary to find a cook in w] in w'$\})$

In this section, I have shown that the hybrid analysis, which combines the choice function analysis of *either* with the ellipsis analysis, fully accounts for the basic data set in Section 2. In the next section, I discuss the predictions that the hybrid analysis makes and some data that are problematic at first sight.

4. Conclusion and further issues

In this paper I have investigated the availability of the WS reading in the *either . . . or . . .* construction and its interaction with the behavior of *either*. It has been shown that the WS reading should be treated semantically, rather than syntactically. The rest of this section is devoted to discussion of a prediction that the choice function analysis of *either* + the ellipsis analysis makes and of some data beyond the basic data set that we have limited ourselves to up to this point. The data apparently go against the prediction, but it is shown that the data are indeed not problematic, pointing out judgment issues that have been overlooked previously.

A prediction that the present analysis makes is that *either* marks the "minimal possible scope" of *or*. I have claimed that *either* introduces a choice function variable and the scope of the variable is determined by the position of Existential Closure. Existential Closure should thus be able to occur at any type *t* position above *either*.

First consider (6)-(8), repeated in (38)-(40) below.

(38)   If Bill praises Mary or Sue then John will be happy.   (Winter, 2000: 403)
      a.   If Bill praises Mary then John will be happy and if Bill praises Sue then John will be happy. (NS)
      b.   If Bill praises Mary then John will be happy or if Bill praises Sue then John will be happy. (WS)

(39)   a.   If Bill praises either Mary or Sue then John will be happy. ([OK] NS / [OK]WS)
      b.   If Bill either praises Mary or Sue then John will be happy. ([OK] NS / [OK]WS)

(40)   *Either if Bill praises Mary or Sue then John will be happy.   (Winter, 2000: 403)

As shown in (38) and (39), when a DisjP is inside an if-clause, which is an island, both the NS and WS readings are available, and the possible readings are the same in sentences with *either* inside the if-clause. As I have stated above, this is straightforwardly accounted for by the proposed analysis, since Existential Closure is not restricted within islands, and ellipsis that takes place inside the if-clause does not cause any problem. In contrast, (40) at first sight seems to go against the prediction that the choice function analysis makes. This is because, according to the analysis, there is no reason for the sentence to become unacceptable.

It may be possible to posit a restriction on ellipsis to avoid this difficulty, for example claiming that ellipsis is island-sensitive, but I would like to point out that there might be a problem in the data itself. Specifically, some native speakers that I have consulted (although the number is still small) suggested that (40) might be degraded for a syntactic reason rather than a semantic one. In particular, they felt that *either* coming next to *if* itself is bad, which indicates that the cause of the degradedness lies in this particular island. Indeed, at least one native speaker who reports that (40) has a syntactic problem judged (41) as grammatical, in which *either* is overtly outside other islands, such as a complex NP island (41a) and a *wh*-island (41b). Although the judgment has to be confirmed by a larger number of native speakers, this suggests that the overt position of *either* is not constrained by syntactic islands, and if this is the case, the data in (40) is not a problem for the present analysis.

(41)   a.   John maintains *either* the claim that Bill should resign or retire.
        b.   John knows *either* who should resign or retire.

However, the problem of the degraded status of (40) remains. Why is it unacceptable even though the full version of the sentence (42) is acceptable?

(42)   Either if Bill praises Mary or if Bill praises Sue then John will be happy.

I have no concrete answer to this question, but I would like to suggest that the unacceptability does not come from island sensitivity but from a syntactic restriction on ellipsis inside questions. This is because there seems to be a connection between (40)&(42), disjoined *wh* questions (43) and disjoined Yes/No Questions (44). In all examples the elided versions are bad. Given that there are studies which claim that some conditionals are a kind of question (e.g. Starr (2014)), it might be the case that what makes (40), (43b), and (44b) unacceptable is the same restriction on ellipsis operative inside questions.

(43)   a.   I need an answer to one of the two questions: Who came or who left?
        b.   *I need an answer to one of the two questions: Who came or left?

(44)   a.   I need an answer to one of the two questions: Did John come or did he leave?
        b.   *I need an answer to one of the two questions: Did John come or leave?

Another point that apparently goes against the prediction of the present analysis that *either* marks the "minimal possible scope" of *or* is Larson's (1985) generalization that we have seen earlier in this paper in (45b).

(45)   Larson's (1985) generalization (Winter, 2000: 395):
        a.   In *or* coordinations without *either*, as well as in *either ... or ...* coordinations with *either* undisplaced, the scope of *or* is confined to those positions where *either* can potentially appear.
        b.   When *either* is displaced it specifies the scope of *or* to be at that displaced position.

Observe that the generalization in (45) states an imbalance in the semantic role of *either*: on the one hand, in sentences with no *either* or with *either* in its base position, *either* marks the minimal possible scope of *or* (45a), but on the other hand, in sentences with floated *either*, *either* marks the exact scope of *or* (45b). This imbalance between the positions of *either* would be a difficult problem to explain. However, some native speakers I have consulted do not agree with the "exact scope marking" nature of floated *either* but judge that floated *either* also marks the minimal possible scope of *or*.

Let us see the examples from Larson (1985). The sentences in (46) have embedded non-finite clauses. In sentences with no *either* (46a) or with *either* in its base position (46b), there are three possible readings: (A) *or* taking narrowest scope, below *look for*, (B) *or* taking scope at the embedded clause level, and (C) *or* taking widest scope at the main clause level. Larson's (1985) judgment for (46c) and (46d) is that the position of floated *either* coincides with the scope of *or*, as given in the second line of the table. The judgment of some native speakers I have consulted, given in the third line of the table, differs crucially from Larson's (1985) in the judgment of (46c). Specifically, they judge that both the (B) reading (the exact scope reading) and the widest scope reading of *or* are available. This shows that they judge that floated *either* marks not the exact scope of *or* but the minimal possible scope of *or*. Thus their judgment does not accord with (45).

(46)   Non-finite clauses (Larson, 1985: 221)
    a.   Sherlock pretended [to be looking for a burglar or a thief].
    b.   Sherlock pretended [to be looking for <u>*either*</u> a burglar or a thief].
        A. S. pretend to look for ((a burglar) or (a thief))
        B. S. pretend [S. look for (a burglar) or S. look for (a thief)]
        C. S. pretend to look for (a burglar) or S. pretend to look for (a thief).
    c.   Sherlock pretended [to <u>*either*</u> be looking for a burglar or a thief].
    d.   Sherlock <u>*either*</u> pretended [to be looking for a burglar or a thief].

	(44a,b)	(44c)	(44d)
Larson (1985)	^{OK}A, ^{OK}B, ^{OK}C	*A, ^{OK}B, *C	*A, *B, ^{OK}C
Other native speakers	^{OK}A, ^{OK}B, ^{OK}C	*A, ^{OK}B, ^{OK}C	*A, *B, ^{OK}C

If this intuition turns out to be correct, it makes it easier to account for the scope of *or* and its interaction with *either*, since we do not have to say, for example, that base-generated *either* has to move covertly to mark the scope of *or* while floated *either* overtly marks the scope of *or*, which Larson (1985) actually proposes. What is more, the uniform "minimal possible scope marking" nature of *either*, if it is real, fits very well with the choice function analysis argued for in this paper, confirming the prediction that the analysis makes, namely that *either* should mark the minimal possible scope of *or*. Thus there might be supporting evidence to further extend the analysis to data outside the basic data set. Note that the ellipsis analysis on its own predicts that *either* would mark the exact scope of *or*, lending further support not to adopt a pure ellipsis analysis but to combine it with the choice function analysis of *either*.

Before closing the section, let me briefly state another prediction of the present analysis related to the one discussed in this section: *either* marks the minimal scope of *or*, and what is more,

the scope of *or* must be unbounded. This is because, as far as I understand, there is no way to keep Existential Closure from taking place when the semantic type of the node is type *t*. The prediction that the scope of *or* must be unbounded is a falsifiable one, and I leave further investigation into this question for future research.

This section has discussed the predictions that the hybrid analysis makes, pointing out judgment issues that have been overlooked previously and opening up the possibility that the hybrid analysis can cover data outside the basic ones.

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