The semantics of additive *either*[1]

Dorothy Ahn — *Harvard University*

Abstract. Focus particles *too* and additive *either* have been analyzed as fully presuppositional elements that presuppose an existence or reference of some salient antecedent. In this paper, I propose an alternative account of *too* and *either*, where they are two-place predicates taking as arguments the overt proposition they adjoin to and a silent propositional anaphor. While *too* asserts a conjunction of the two arguments, *either* asserts a disjunction of the two arguments. The main advantages of this proposal are that *too* and *either*'s non-presuppositional behavior is accounted for, and that the conjunction-disjunction switch has implications on additive *either*'s NPI behavior.

Keywords: focus, presuppositions, Negative Polarity Items

1. Introduction

The focus particles *too* and additive *either* appear clause-finally and add to the host proposition a meaning similar to the adverb *also*. For example, (1) can be paraphrased as *John also came to the party* while (2) can be paraphrased as *John also didn't come to the party*.

(1) John$_F$ came to the party too.

(2) John$_F$ didn't come to the party either.

Additive *either* is similar to *too* in requiring some antecedent information to be salient in the context, meaning that (1) requires a salient information entailing that someone other than John came to the party, while (2) requires one that entails that someone else did not come. On the other hand, *either* differs from *too* in that its distribution is restricted. It is not licensed, for example, in a positive environment like (3):

(3) *We're going to Philly either.

In order to explain this relation between *too* and *either*, this paper proposes that *too* and *either* assert a conjunction and a disjunction, respectively. This deviates from the general assumption that additive particles such as *too* and *also* only add a presuppositional component to the meaning of the host proposition (see Heim 1992, Rullmann 2004, Cohen 2009, a.o.). I argue that this paper's proposal is a harmless modification to the existing presuppositional analyses, and that analyzing *either* as its disjunctive counterpart provides a natural way to account for its NPI behavior.

[1]I thank Isabelle Charnavel, Gennaro Chierchia, Dan Lassiter, Andreea Nicolae, Yimei Xiang, and audiences at ECO5 2014 at Maryland, the LFRG meeting at MIT, and SuB19 at Goettingen for helpful comments and feedback.

2. Previous accounts of *too* and *either*

Rullmann (2003) treats additive *either*[2] as an NPI counterpart of *too*. He begins by pointing out a problem with purely morphological accounts of *too* and *either* (Klima 1984, a.o.), in which *either* is simply an allomorph of *too* that appears in negative clauses. Under the assumption of the morphological account that *too* and *either* are identical in meaning, the unacceptability of using *either* in (5) is not explained.

(5) John washed the dishes. He shouldn't do the laundry too/*either.

Rullmann argues that *too* and *either* are not identical in meaning – more specifically that *either* has a different presupposition from that of *too*. Unlike *too* which presupposes that some antecedent is true in addition to the host proposition it adjoins to, *either* presupposes that the antecedent is false. This negative presupposition is not satisfied by the antecedent clause in (5), thus ruling out *either*. Rullmann's definition of *too* is given below:

(6) Semantics of *too*:
   a. ordinary semantic value: $[\![p \textbf{ too}]\!]^o = [\![p]\!]^o$
   b. focus value: $[\![p \textbf{ too}]\!]^f = \{[\![p]\!]^o\}$
   c. presupposition: [p too] presupposes that there is at least one contextually salient proposition $q \in [\![p]\!]^f$ **-** $\{[\![p]\!]^o\}]\!]$ such that q is true.

With this definition, *too* adjoining to a proposition p (*John left*) would assert that p is true, and presuppose that there is at least one contextually salient proposition q such that q is true. This q must be a focus alternative of p.

As shown in (7), Rullmann analyzes *either* to be identical to *too* except for its negative presupposition: it presupposes that the contextually salient proposition q is false. This negative presupposition explains why *either* cannot appear in (5): the antecedent clause is not compatible with the negative presupposition.

[2]There are at least three different uses of *either* in modern English (Rullmann 2003, 2004), as shown below (using Rullmann's labels):

(4) a. **Disjunctive**: We're **either** going to Cambridge or to Philadelphia.
   b. **Determiner**: We're not going to **either** city.
   c. **Additive**: We're not going to Cambridge. We're not going to Philadelphia, **either**.

This paper focuses on proposing an analysis for the additive *either*, and I will interchangeably use the terms 'either' and 'additive *either*' to refer to this type.

(7) Semantics of *either*:
   a. ordinary semantic value: $[\![p \textbf{ either}]\!]^o = [\![p]\!]^o$
   b. focus value: $[\![p \textbf{ either}]\!]^f = \{[\![p]\!]^o\}$
   c. presupposition: [p either] presupposes that there is at least one contextually salient proposition $q \in [\![p]\!]^f$ - $\{[\![p]\!]^o\}$ such that q is false.

Additive *either* is analyzed as a 'well-behaved NPI' that scopes under negation, and Rullmann accounts for its NPI distribution by adding a licensing condition to its definition:

(8) Licensing Condition for *either*:
   [p either] must be contained in a constituent which implies (i.e. entails or implicates) that $[\![p]\!]^0$ is false.

This licensing condition can explain the contrast between (9) and (10) because a positive environment in (10) does not entail that p is false, violating the licensing condition.

(9) John didn't leave either.
   a. p = John left
   b. ALTs: {Mary left, Bill left, Sue left}
   c. Licensing condition: entails that p is false

(10) *John left either.
   a. p = John left
   b. ALTs: {Mary left, Bill left, Sue left}
   c. Licensing condition: does not imply that p is false

2.1. Advantages and problems

Two main advantages of Rullmann's account of *either* are that a) it captures the similarity between *too* and *either* by providing a parallel account of both elements, and that b) it analyzes *either* as an NPI that takes scope below the negation.

There are two main differences between *too* and *either*. The first difference is that *too* requires a positive antecedent while *either* requires a negative antecedent. This is accounted for by *either*'s negative presupposition. The second difference is that *either* is an NPI while *too* is not. To account for this difference, Rullmann stipulates a licensing condition that restricts *either*'s distribution. While this condition roughly captures *either*'s restricted distribution, it also runs into conceptual and empirical problems.

Rullmann notes that the licensing condition as defined makes incorrect predictions about *either*'s distribution. For instance, elements like *almost* is predicted to license *either*.

(11) The paper is almost finished.
a. *The paper is almost finished either.

The sentence in (11) implies that the paper is not finished. Assuming that *either* adjoins to p which is *The paper is finished*, the adverb *almost* is wrongly predicted to license *either* because the overall implication of (11) is that p is false. While other problems exist and are discussed in his paper, Rullmann leaves the details of the licensing condition to be modified in future work.

However, a problem more critical than the wrong predictions is the use of a stipulated licensing condition to account for *either*'s distribution. Even a modified version of the licensing condition would miss an important generalization that *too* is not an NPI while *either* is. Nothing in this account prevents this licensing condition from being added to *too*, so the licensing condition does no more than simply describing *either*'s behavior.

In Rullmann's proposal, two components are crucial in licensing additive *either*: the presupposition satisfaction and the licensing condition. While the presence of an additive presupposition explains why *too* and *either* both require antecedent information, *either*'s negative presupposition ensures that the antecedent is negative, unlike *too*. *Either*'s NPI distribution, however, cannot be derived from this difference, and a stipulated licensing condition is added to the definition. Thus, what we are in need of is a theory that maintains Rullmann's intuitions about the parallelism between *too* and *either* but derives *either*'s NPI distribution in a way that minimizes stipulations. In the next section, I propose a new account of *too* from which I derive the account of *either*.

3. Semantics of *too*

There is a vast literature on the focus particle *too*. In this section, I review three main properties of *too* that an adequate analysis of *too* must account for, and propose an analysis that can derive those properties. Then I compare the proposed account with some previous accounts, showing that it has an advantage over existing presuppositional accounts of *too* (Rullmann 2003, Heim 1992) in that it can account for cases where *too*'s meaning contribution does not seem presupposed.

3.1. *Too*'s requirement of an antecedent

An important property of *too* is its requirement of an antecedent information. It has long been observed that a simple existential presupposition is not adequate to license *too*. For example, in Kripke's (2009) example in (12), an existential presupposition would be that there exists an

antecedent that is also true.

(12) John$_F$ is having dinner in New York tonight too.

Kripke shows that, even if it is part of the common knowledge that many people dine in New York every night, this would not make the use of *too* felicitous. Making this observation, many accounts have incorporated anaphoricity in analyzing *too*, deriving the obligatory reference to a salient antecedent (Heim 1992, Kamp & Rossdeutscher 1994). I call this the antecedent requirement property of *too*:

(13) **Antecedent Requirement** The host proposition of *too* requires a parallel antecedent information that is salient (discourse or contextual).

This salient antecedent information is further constrained by two additional properties of *too*: focus sensitivity and distinctness.

The meaning of *too* is sensitive to focus, which determines the form of the potential antecedent. For example, when (12) is uttered out of the blue, what we seem to be missing is an antecedent entailing that someone else is dining in New York. However, when the stress is on *New York* as in (14), the antecedent we seem to be missing is something that entails that John is having dinner in some other location (Cohen 2009).

(14) John is having dinner in New York$_F$ tonight too.

Another restriction is that the antecedent be distinct from the host. This property has been called the non-identity presupposition (Kripke 2009) or the distinctness requirement (Cohen 2009). Kripke (2009) uses an example like (15) to show that *too* presupposes *John* and the *the boss* to refer to distinct individuals.

(15) If John$_i$ is coming to the party, the boss$_{*i}$ will come too.

In summary, the three main properties of *too*'s antecedent are that it must be necessary and salient, that it must be a focus alternative of the host, and that it must be distinct from the host. I summarize these properties below:

(16) Main properties of the antecedent of *too*:

1.**Antecedent Requirement** Antecedent must be salient

2.**Focus Sensitivity** Antecedent must entail a proposition in the focus value of the host

3.**Distinctness** Antecedent must be distinct from the host

In the next section, I review Rullmann (2003) and Heim's (1992) accounts of *too* with respect to their implementations of these properties.

3.2. Previous accounts of *too*

Under Rullmann's account, *too* presupposes that there exists a contextually salient distinct focus alternative that is true. This presupposition meets the Focus Sensitivity requirement as well as the Distinctness requirement. As for the Antecedent Requirement property, however, what Rullmann posits is a simple existential presupposition. It was already shown that a simple existential presupposition is not adequate in licensing *too*. While Rullmann acknowledges this, he simply uses the notion of a 'contextually salient' antecedent to refer to this property and refers the reader to accounts that do discuss this property further, one of which is Heim (1992).

Heim (1992) argues that *too* is implicitly deictic or anaphoric, with its meaning similar to 'in addition to x'. For example, in (17), *too* has a meaning similar to 'in addition to Mary', and is coindexed with *Mary* in the antecedent sentence.

(17) John believes that Mary_1 is here, and he believes that Sue_F is here too_1.

The meaning contribution of *too* under Heim's account can be represented as in (18)

(18) $\phi[\alpha_F]$ too_i presupposes $\text{x}_i \neq \alpha$ & $\phi[\text{x}_i]$

This is one way to implement the first property of *too*. Note that because Heim assumes *too* itself to be an anaphor, the antecedent that is required is some e type individual. Thus, under her analysis, the implementation of the latter two properties must be modified accordingly: the antecedent would have to be a distinct alternative of the focused element in the host proposition.

While Heim incorporates anaphoricity to the definition of *too*, it still remains a presuppositional account because all *too* does is presuppose that the proposition holds for the salient antecedent as well. In the next section, I propose an alternative account, in which the meaning contribution of

too is not restricted to the presupposed component.

3.3. Proposal

I propose that *too* is a two-place predicate that takes two arguments. One of the arguments is the host proposition p that it adjoins to. The other argument is a silent propositional anaphor q. It presupposes that the propositional anaphor must be a distinct focus alternative of the host proposition, making use of the Rooth (1992) type focus theory. The resulting assertion is a conjunction of the two arguments. The definition is given in (19).

(19) $[\![\textbf{too}]\!](q)([\![\textbf{p}]\!]_{\sim C}) = \lambda w\text{: } q \in C - \{[\![p]\!]^o\}.\ q_w \wedge [\![\textbf{p}]\!]^w$

For example, in (20), *too* adjoins to the host proposition p which is *John left*. It takes a silent propositional anaphor q, which is presupposed to be of the form X left, and asserts a conjunction between them. The resulting assertion can be paraphrased as 'In addition to q being true, John left.'

(20) John$_F$ left too.
- a. $[\![\textbf{p}]\!]$ = John$_F$ left
- b. $[\![\textbf{too}]\!](q)([\![\textbf{p}]\!])$
  - (i) Presupposes that q is a distinct focus alternative of $[\![\textbf{p}]\!]$: X left.
  - (ii) Asserts $q \wedge [\![\textbf{p}]\!]$

An assertion of q, an anaphor that takes a propositional antecedent, can receive a similar analysis as overt propositional pronominals such as *that* in (21). It is also possible to have an antecedent that is embedded under negation. Krifka (2013) shows that while the pronoun *it* in (22a) refers to the whole proposition (22), the same pronoun in (22b) refers to the proposition embedded under negation.

(21) [John stole the cookie]$_1$. Bill knows [that]$_1$.

(22) [$_{NegP}$ John didn't [$_{TP}$ t_{John} t_{did} lie]$_1$]$_2$
- a. ...and he actually can prove [it]$_2$.
- b. ...even though people believed [it]$_1$.

The account of *too* proposed in this paper makes desirable predictions of its interaction with negation. When the host proposition contains a negation, the negation can either take wide scope or

narrow scope with respect to *too*. When the negation scopes under *too*, the reference of the propositional anaphor is also predicted to contain a negation. For example, (23) is felicitous because q, being a focus alternative of p, must also contain a negation.

(23) John didn't visit Boston. Bill_F didn't visit Boston too.
  a. p = Bill didn't visit Boston.
  b. Presupposes that q is of the form *X didn't visit Boston*.
  c. Discourse antecedent satisfies the presupposition and resolves the reference of q.

Too can also take scope over negation, as discussed in Kripke (2009) and Soames (2009).

(24) Sue bought some books. (But) Mary didn't buy them too.

Because the host proposition p does not contain a negation, the computation is as follows:

(25) Mary didn't buy them too.
  a. = ¬⟦**too**⟧(Mary bought the books)
  b. Presupposes that q is of the form X bought the books.
  c. Asserts ¬[q ∧ p] = ¬q ∨ ¬p

The resulting assertion is a disjunction between ¬q and ¬p. The truth value of q's reference is already provided via discourse: Sue bought some books, thus q is true. If we thus rule out the first disjunct, we are left with ¬p, which is the desired meaning.

The main novelty of the account proposed here is that the additive implication of *too* comes about via an assertion of a conjunction with a silent anaphor, rather than being presupposed. This conjunction account has some advantage over previous accounts in which *too* is fully presuppositional. Abrusán (2014) argues that the additive implication contributed by *too* is also part of the entailment, discussing examples like (26).

(26) a. #Mary went to the shop, but it is not the case that somebody went there.
  b. Mary went to the shop, but it is not the case that somebody went there as well.

If the additive implication in (26b) was simply presupposed, the entailed meaning of (26b) should be contradictory just like (26a). Because it is not, she argues that the additive meaning of *too* must also be part of the entailed meaning. The conjunctive account in which *too* asserts q in addition to

p can explain why (26a) leads to a contradiction, but (26b) does not: it is the conjunction that is negated in (26b) while it is the existentially quantified proposition that is negated in (26a).

Abrusán argues that while the additive implication of *too* is part of the entailed meaning, it must always become presupposed, following her presupposition triggering mechanism given in (27).

(27) *Presupposition triggering*
Entailments of a sentence S that can be expressed by sentences that are neither necessarily about the event time of the matrix predicate of S nor about the event time of the sentence expressing the most direct answer to the (grammatically signaled) background questions are presupposed.

For example, in (28), the additive meaning that John ate something other than beans is neither necessarily about the speech event time nor about the event time of the sentence expressing the most direct answer to the background question, which is the event time of the predicate *ate* in B's response. Therefore, *too*'s additive implication is predicted to be presupposed in Abrusán's mechanism.

(28) A: John ate broccolis. What else did he eat?
B: He also ate [beans]$_f$.
implies: John ate x_c & $x_c \neq$ beans.

Under Abrusán's assumption that *too*'s additive meaning is implied and not asserted, the presupposition triggering mechanism predicts the additive meaning to be always presupposed. However, speakers seem to find cases like (29) felicitous when the question at hand is about whether *both* Mary and John were in the elevator. This is not predicted by the presupposition triggering mechanism because with Abrusán's definition of *too*, that Mary is in the elevator has to be presupposed.

(29) I don't know if Mary is in the elevator. But if John is in the elevator too, we will go over the weight limit. (Adapted and modified from Cohen (2009) and Rooth (1999))

Under the conjunction account, I can argue that the question at hand in (29) is the conjunctive meaning (that both are in the elevator), and so the whole assertion of *too* is entailed and the first conjunct does not need to be presupposed.

In this section, I have shown that the conjunction account of *too* has advantages over fully presuppositional accounts and makes more precise predictions about *too*'s distribution using Abrusán's mechanism.

4. Semantics of *either*

I propose that additive *either* is a disjunctive counterpart of *too*, with its meaning identical to *too* except that it asserts a disjunction rather than a conjunction.

(30) $[\![\textbf{too}]\!](q)([\![\textbf{p}]\!]_{\sim C}) = \lambda w\text{: } q \in C - \{[\![p]\!]^o\}.\ q_w \wedge [\![\textbf{p}]\!]^w$

(31) $[\![\textbf{either}]\!](q)([\![\textbf{p}]\!]_{\sim C}) = \lambda w\text{: } q \in C - \{[\![p]\!]^o\}.\ q_w \vee [\![\textbf{p}]\!]^w$

The assertion of an anaphor q captures the same antecedent requirements that *either* and *too* share: there must be a salient distinct antecedent that is a focus alternative of the host. Following Rullmann, I assume that *either* scopes under negation. For example, in (32), negation scopes over *either* adjoining to p which is *John left*, and q is presupposed to be in C constrained by the focus on *John*. Thus, the reference of q in (32) is identical to the reference of q in the positive sentence with *too* as in (33).

(32) John$_F$ didn't leave either.
   a. $\neg[\![\textbf{either}]\!](q)([\![\textbf{p}]\!])$
   b. p = John left
   c. Presupposes that q is of the form X left
   d. Asserts $\neg[q \vee p] = \neg q \wedge \neg p$

(33) John$_F$ left too.

However, because the resulting assertion is a negation of a disjunction, both p and q end up being negated as shown in (32d). As a result, the meaning in (32) is 'In addition to q being false, John didn't leave.' Because q is negated in the assertion, the necessary contextual information must entail $\neg q$, either with a discourse or contextual information as below:

(34) a. Discourse antecedent entailing *Bill didn't leave*.
   b. Context in which Bill didn't leave.

So far I have argued that *too* and additive *either* adjoining to p take a silent propositional anaphor q and the proposition p as arguments. While *too* asserts a conjunction of q and p, *either* asserts a disjunction. Because q is an anaphor that requires an antecedent, a discourse or contextual antecedent must be available, and the truth value of the antecedent must be compatible with the resulting assertion of the sentence containing *too* and *either*.

5. Distribution of *either*

The two aspects of additive *either* that we wanted to capture were its relation to *too* and its NPI behavior. By arguing that *too* and *either* both take a silent propositional anaphor as an argument, we have captured the three properties – Antecedent Requirement, Focus Sensitivity, and Distinctness – that *too* and *either* share. It was shown that the difference *too* and *either* show in their requirements of the antecedent arise from *either* asserting a disjunction rather than a conjunction: because negation scopes over disjunction, both p and q are asserted to be false, unlike *too*. However, we do not yet have an account for why *either* cannot appear in positive contexts. This section attempts to account for additive *either*'s restricted distribution. It is proposed here that the NPI nature of *either* also derives from its assertion of a disjunction.

5.1. Disjunction and NPI

Under the account proposed here, *either* is a disjunction that contains an anaphor. The difference between a conjunction and a disjunction, and between a universal and an existential more generally, carries some implications on an element's polarity sensitivity. There have been cases of polarity sensitive disjunctions attested in other languages (Aranovich 2006, Amritivalli 2003, a.o.), and it is generally observed that existentials rather than universals are sensitive to polarity. For example, existentials like *any* and *ever* are NPIs in English, but universals such as *all* and *every* are not. Thus, the difference between *too* and *either* under my analysis can link *either*'s behavior to a more general discussion of polarity sensitivity. This has an advantage over accounts like Rullmann's, in which the difference in the presuppositions of *too* and *either* does not carry implications for *either*'s NPI nature, needing a separate licensing condition to be stipulated.

There have been recent attempts to formalize the generalization that only existentials tend to be NPIs, one of them being the exhaustification-based analysis of NPIs. In the next section, I discuss the exhaustification framework and show how *either*'s restricted distribution can be derived from its disjunctive meaning under this framework.

5.2. Exhaustification-based analysis of NPIs

The Exhaustification-based analysis of NPIs is a program of reducing the NPI behavior to a grammatical process of exhaustification (Krifka 1995, Lahiri 1998, Chierchia 2006, 2013). Regular indefinites like *some* trigger scalar implicature when relevant. Under the grammatical analysis, this implicature arises via exhaustification through an O operator which agrees with the alternative-bearing element in its c-commanding domain, affirms the prejacent, and negates all non-entailed alternatives. For example, the sentence in (35), in a relevant context, triggers exhaustification of all non-entailed alternatives. The prejacent containing *some*, notated as ϕ_{some}, has as its scalar al-

ternative ϕ_{all}. The resulting exhaustified meaning is that ϕ_{some} is true and ϕ_{all} is false, as shown in (35c).

(35) Some students passed the test.
  a. O[some students passed the test]
  b. ALT = $\{\phi_{\text{some}}, \phi_{\text{all}}\}$
  c. O[(35)] = Some but not all students passed the test

Chierchia (2013) argues that, unlike the scalar alternative of *some* which is only activated when relevant, the alternatives of NPIs are not subject to relevance, and therefore always active. Under the assumption that the NPI *any* has an identical meaning to *some*, the contrast in (36) can be explained in terms of this difference in obligatoriness of alternatives. Chierchia argues that this difference arises from the fact that, unlike *some/a*, *any* obligatorily activates its domain alternatives and is exhaustified by O_D (which selects for domain alternatives).

(36) a. John ate some cookie.
  b. *John ate any cookie
    (i) O_D[John ate any$_D$ cookie]

Domain alternatives are formed by taking subsets of the domain of the prejacent. We can look at a simplified model in (37) for an illustration. In a model where there are three cookies, subdomain alternatives are as listed in (37a).

(37) Model: three cookies (D = $\{c_1, c_2, c_3\}$)
  a. D-ALT = $\{\{c_1, c_2, c_3\}, \{c_1, c_2\}, \{c_1, c_3\}, \{c_2, c_3\}, \{c_1\}, \{c_2\}, \{c_3\}\}$
  b. Assertion: $\exists x \in D$ [cookie(x) $\wedge$ eat(x)(j)]
  c. Assertion (simplified): $C_1 \vee C_2 \vee C_3$
  d. Exhaustification: negating all non-entailed ALTs $\rightarrow$ Contradiction ($\perp$)
    ($C_1 \vee C_2 \vee C_3 \wedge \neg C_1 \wedge \neg C_2 \wedge \neg C_3$ ...)

If we simplify the assertion in (37b) so that C_n means $[\![$**John ate c**$_n]\!]$, then the simplified assertion can be represented as a disjunction in (37c). Because the prejacent does not entail any of its alternatives, exhaustification negates all the alternatives. This leads to a contradiction because the resulting assertion is that John ate c_1, c_2, or c_3 but that he didn't eat c_1, c_2, or c_3, and so on.

The logical contradiction that results from exhaustification rules out (36b). On the other hand, in (38), where *any* occurs in a negative environment, exhaustification does not lead to a contradiction. This is because a negation of a disjunction is equivalent to a conjunction of negated disjuncts, and

the prejacent entails all its alternatives. This leads to a vacuous exhaustification that simply results in the prejacent we started with.

(38) John didn't eat any cookie.
   a. Assertion: *No cookie exists such that John ate it*. $\neg C_1 \wedge \neg C_2 \wedge \neg C_3$
   b. All alternatives entailed: $\neg C_1$, $\neg C_2$, $\neg C_3$, and so on
   c. $\rightarrow$ Vacuous Exhaustification

The generalization that NPIs are elements that appear in lower-ends of scales such as existentials and indefinites (Lauer 2013, Chierchia 2013) is predicted by the exhaustifcation-based account: alternatives of such elements are stronger than (not entailed by) the elements, thus must be negated. The alternatives of NPIs cause exhaustification to lead to a contradiction. On the other hand, when such lower-end items appear in downward-entailing contexts (DE), they are the strongest elements of their scales, so all alternatives are entailed and exhaustification is vacuous. Exhaustification via the O operator thus derives and explains why NPIs like *any* and *ever* are only grammatical in DE contexts: in non-DE contexts, the stronger alternatives must be negated, leading to a contradiction.

I propose that additive *either* in positive contexts is ruled out due to the same reason. I assume that, because it asserts a disjunction, additive *either* activates the same domain and scalar alternatives of a regular disjunction. The alternatives of a disjunction, which include the standard scalar alternative and the domain alternatives following Sauerland (2004), are shown in (39).

(39) $\text{ALT}(q \vee p) = \{q \vee p, q, p, q \wedge p\}$
   a. $\{q \vee p, q \wedge p\}$: standard scalar alternatives (σA)
   b. $\{q \vee p, q, p\}$: each individual disjunct as Domain alternatives (DA) (Sauerland, 2004)

Considering that *either* adjoining to p and taking a propositional anaphor q asserts a disjunction between q and p, I argue that the alternatives are identical to that of a disjunction:

(40) $\text{ALT}([\![\textbf{either}]\!](q)(p)) = \{q_w \vee p_w, q_w, p_w, q_w \wedge p_w\}$

With this assumption, we first check if the exhaustification-based account can be applied to additive *either* and correctly lead to a contradiction in positive contexts. Because *either* activates both domain and scalar alternatives, we exhaustify using O_{ALT} (ALT: total set of alternatives - scalar and domain, cf. Chierchia 2013). Following the definition of *either* proposed above, the meaning of (41) is (42a). Similar to the case of *any* in a positive context, the resulting disjunction does not entail its alternatives, thus all of them must be negated. This leads to a contradiction, and (41) is ruled out.

(41) *John left either.

(42) O_{ALT} [John left **either**]

a. Asserts: $q_w \vee p_w$ (p = ⟦**John left**⟧)

b. Alt = $\{q_w \vee p_w, q_w, p_w, q_w \wedge p_w\}$

c. O_{ALT} [p **either**]
= $[q_w \vee p_w] \wedge \neg q_w \wedge \neg p_w \wedge \neg[q_w \wedge p_w] = \bot$

Note that adopting this analysis does not affect the grammatical case where *either* is in a negative environment. Under negation, the disjunction becomes the strongest alternative, entailing all other alternatives. We have a vacuous exhaustification that results in the prejacent we started with.

(43) John didn't leave either.

(44) O_{ALT} [John didn't leave **either**]

a. Asserts: $\neg[q_w \vee p_w]$ (p = ⟦**John left**⟧)

b. Alt = $\{\neg[q_w \vee p_w], \neg q_w, \neg p_w, \neg[q_w \wedge p_w]\}$

c. O_{ALT} ¬[p **either**]
= $\neg[q_w \vee p_w]$

The second goal of an adequate account of additive *either* was to capture and explain its NPI behavior. In this section it was shown that the NPI behavior is a possible result of the switch from conjunction to disjunction between *too* and *either* because disjunction and existentials in general are the ones that are polarity sensitive, not conjunction and universals. It was also shown that this link between asserting a disjunction and having an NPI distribution can be formally derived following the exhaustification-based account, if a natural assumption is made that *either* activates the alternatives of a regular disjunction.

Because *either*'s distribution is constrained due to the exhaustification process that leads to a contradiction in positive contexts, this account does not make the same wrong prediction that Rullmann's licensing condition makes. For example, *almost* in (45) is not predicted to license additive *either* because the alternatives in (45c) are not entailed by the prejacent in (45b), and thus need to be negated. This leads to a contradiction.

(45) *The paper is almost finished either.

a. almost[⟦**either**⟧(q)(p)] p = ⟦**The paper is finished**⟧

b. Asserts: almost $(q \vee p)$

c. Alt = {almost(q∨p), almost(q), almost(p), almost(q∧p)}

6. Conclusion

The main proposal of this paper is that the focus particles *too* and *either* are two-place predicates that take a silent propositional anaphor q in addition to the host proposition p they adjoin to, asserting a conjunction and a disjunction, respectively. In proposing the analysis for *too*, the replacement of the generally assumed 'additive presupposition' with an assertion of a conjunction where one of the conjuncts is an anaphor was motivated by the fact that this modification allows us to explain cases where the additive meaning of *too* does not seem fully presuppositional. A further advantage of this account is that it gives a parallel disjunctive analysis for *either* where the sole difference between the two elements is directly relevant for both *either*'s antecedent requirement properties and its NPI behavior. As the disjunctive counterpart, additive *either* is more likely to be sensitive to polarity, and there is a formal way to derive this property under the exhaustification-based framework.

One critical question that remains is how this analysis can account for the fact that additive *either* is not simply an NPI but a Strong NPI (SNPI), further restricted to negative contexts only. The account so far predicts additive *either* to be licensed in all DE contexts through a vacuous exhaustification. Deriving the SNPI nature of additive *either* would be important in linking this analysis to other types of *either* such as the disjunctive *either* and the determiner *either*.

References

Abrusán, M. (2014). On the focus-sensitive presupposition triggers *too, again, also, even*. In U. Etxeberria, A. Fălăuş, A. Irurtzun, and B. Leferman (Eds.), *Proceedings of Sinn und Bedeutung*, Bayonne and Vitoria-Gasteiz, pp. 6–23.

Amritivalli, R. (2003). Question and negative polarity in the disjunction phrase. *Syntax 6*(1), 1–18.

Aranovich, R. (2006). A polarity-sensitive disjunction. In *New Perspectives on Romance Linguistics: Selected Papers from the 35th Linguistic Symposium on Romance Languages (LSRL), Austin, Texas, February 2005*, pp. 1. John Benjamins Publishing Co.

Chierchia, G. (2006). Broaden your views: Implicatures of domain widening and the logicality of language. *Linguistic inquiry 37*(4), 535–590.

Chierchia, G. (2013). *Logic in grammar: Polarity, free choice, and intervention*, Volume 2. Oxford University Press.

Cohen, S. (2009). *On the semantics of Too and Only: Distinctness and subsumption*. Ph. D. thesis, UMass Amherst.

Fox, D. (2006). Free choice and the theory of scalar implicatures.

Giannakidou, A. (1998). *Polarity sensitivity as (non) veridical dependency*, Volume 23. John Benjamins Publishing.

Klima, E. S. (1964). *Negation in english*. na.

Krifka, M. (1995). The semantics and pragmatics of polarity items. *Linguistic analysis 25*(3-4), 209–257.

Krifka, M. (2013). Response particles as propositional anaphors. In T. Snider (Ed.), *Semantics and Linguistic Theory*, pp. 1–18.

Kripke, S. A. (2009). Presupposition and anaphora: Remarks on the formulation of the projection problem. *Linguistic Inquiry 40*(3), 367–386.

Lahiri, U. (1998). Focus and negative polarity in hindi. *Natural language semantics 6*(1), 57–123.

Larson, R. K. (1985). On the syntax of disjunction scope. *Natural Language & Linguistic Theory 3*(2), 217–264.

Lauer, S. (2013). *Towards a dynamic pragmatics*. Ph. D. thesis, Stanford University.

Levinson, D. (2008). *Licensing of negative polarity particles yet, anymore, either and neither: Combining downward monotonicity and assertivity*. Ph. D. thesis, Stanford University.

McCawley, J. D. (1998). *The syntactic phenomena of English*. University of Chicago Press.

Rohde, H. and A. Kehler (2014). Grammatical and information-structural influences on pronoun production. *Language, Cognition and Neuroscience 29*(8), 912–927.

Rooth, M. (1985). *Association with focus*. Ph. D. thesis, UMass Amherst.

Rooth, M. (1999). Association with focus or association with presupposition? *Focus: Linguistic, cognitive, and computational perspectives*, 232.

Rullmann, H. A note on the history of either. In A. P. K. Y. M. Andronis, E. Debenport (Ed.), *Proceedings of Chicago Linguistics Society*, Volume 38.

Rullmann, H. (2003). Additive particles and polarity. *Journal of semantics 20*(4), 329–401.

Sauerland, U. (2004). Scalar implicatures in complex sentences. *Linguistics and philosophy 27*(3), 367–391.

Soames, S. (2009). Kripke on presupposition and anaphora.