

Additive *either*: a disjunctive counterpart of *too*¹

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1 Introduction: additive *either*

There are at least three different uses of *either*:

- (1) 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**.
 → Today's talk

1.1 Outline

- Discuss the properties of additive *either*, such as its restricted distribution
- Review one account of deriving focus particles *too* and *either* (Rullmann, 2003)
- Propose a new analysis of *too* and *either*, where *either* is a disjunctive counterpart of *too*
- Show that the present proposal has conceptual and empirical advantages

2 Observations

Additive *either*: Negative Polarity Item (NPI) that appears clause-finally in English:

- (2) John didn't leave. Bill_F didn't leave **either**.

- Host: clause containing *either*
- Antecedent: clause preceding host

2.1 Relation between antecedent and host

The antecedent:

- necessary (discourse or context)
 - must entail a proposition in the focus value of the host
- (3) a. Bill didn't smoke. Bill didn't drink_F either.
 - b. #John didn't smoke. Bill didn't drink_F either.
 (Focus value of host: {Bill didn't **smoke**, Bill didn't **eat**...})
 - (4) I hate pizza. I don't like spaghetti either.
 (Focus value of host: {I don't like **pizza**, I don't like **salad**...})

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2.2 Distribution

Additive *either* is primarily licensed **under negation**:

- (5) a. (John didn't leave.) Bill didn't leave either.
 b. *Bill left either.

Goals

An adequate account of additive *either* must account for:

- the relation between the host and the antecedent
- its restricted distribution

3 Rullmann, 2003

Focus particles *too* and *either* display similar behavior:

- Both have meanings that can be paraphrased with *also*
- (6) a. (Jason danced.) He smiled **too** / He also smiled.
 b. (Jason didn't dance.) He didn't smile **either** / He also didn't smile.
- Both have additive presuppositions, requiring some additional proposition to be present in the context

Unlike *too*, *either* behaves like an NPI in that it must occur under negation.

(7) Semantics of *too*

- a. ordinary semantic value: $\llbracket p \text{ too} \rrbracket^0 = \llbracket p \rrbracket^0$
 b. presupposition: $\llbracket p \text{ too} \rrbracket$ presupposes that there is at least one contextually salient proposition $q \in \llbracket p \rrbracket^f - \{\llbracket p \rrbracket^0\}$ such that q is true.

(8) Semantics of *either*

- a. ordinary semantic value: $\llbracket p \text{ either} \rrbracket^0 = \llbracket p \rrbracket^0$
 b. presupposition: $\llbracket p \text{ either} \rrbracket$ presupposes that there is at least one contextually salient proposition $q \in \llbracket p \rrbracket^f - \{\llbracket p \rrbracket^0\}$ such that q is **false**.
 c. **licensing**: $\llbracket p \text{ either} \rrbracket$ must be contained in a constituent which implies (i.e. entails or implicates) that $\llbracket p \rrbracket^0$ is false.

- (9) a. Bill won't leave either.
 (i) not $\llbracket \llbracket \text{Bill will leave} \rrbracket_p \text{ either} \rrbracket$ (implies that p is false)
 b. *I hate pizza either.
 (i) $\llbracket \llbracket \text{I hate pizza} \rrbracket_p \text{ either} \rrbracket$ (doesn't imply that p is false)

3.1 Advantages of Rullmann's account

- Deriving *either* from *too* captures the similarities between the two focus particles
- Analyzing *either* as appearing under negation (or some other licenser that meets the licensing condition) roughly captures its NPI behavior

3.2 Problems

Conceptual and empirical problems with the licensing condition:

- Conceptual: the NPI distribution of *either* results from a stipulated condition
 - NPI distribution is not derived but given as a condition
 - There is no explanation of why additive *either* has to be an NPI when *too* is not (there is nothing in the lexical entry of *either* that would predict its NPI behavior)
- Empirical: the condition as defined makes wrong predictions about *either*'s distribution
 - predicts that *almost* can license *either* (Rullmann, 2003 citing Horn, p.c.)

(10) The paper is almost finished.

- a. $p =$ the paper is finished ((10) implies that p is false)
- b. *The paper is almost finished either.

- cannot capture the contrast between *nobody but* and *only* with respect to their ability to license *either* (Rullmann, 2003)

(11) a. Nobody but John likes tomatoes either.

b. *Only John likes tomatoes either.

- licensing condition would predict both to be bad

- one possible resolution: require syntactic negation in the licensing condition
→ but syntactic negation is not necessary (*Few has been to Seoul either.*)

⇒ What we need is a theory that:

- follows up on Rullmann's intuitions (symmetry between *either* and *too*; *either* as NPI)
- minimizes stipulative modifications
- captures *either*'s restricted distribution more precisely

4 Proposal

Plan: Come up with a theory of *too*, then extend it to *either*

4.1 Semantics of *too*

Some well-known facts about *too*:

- It requires some salient antecedent info paralleling the host ((12) odd without context)
- This salient information can be provided via discourse or context (broadcast of Princeton)
- This salient information must entail a focus alternative of the host (must entail a proposition of the form *X is having dinner in Princeton*)

(12) John_F is having dinner in Princeton tonight too. (Kripke, 2009)

PROPOSAL: *Too* is an **anaphoric focus particle that asserts a conjunction.**

- (13) $\llbracket \text{too} \rrbracket(q)(\llbracket p \rrbracket) = \lambda w: q \in \llbracket p \rrbracket^f - \{\llbracket p \rrbracket^o\}. q_w \wedge \llbracket p \rrbracket^w$
- q : silent propositional anaphor that picks up a discourse referent (DR)
 - Presupposition: q is a focus alternative of p different from p
 - Assertion: $q_w \wedge \llbracket p \rrbracket^w$
 $\llbracket \text{too} \rrbracket(q)(\llbracket \text{Bill left} \rrbracket) = \text{“In addition to } q \text{ being true, Bill left.”}$

q as an anaphor:

- Krifka (2013): anaphors that pick up DRs anchored to salient propositions

- (14) a. [John stole the cookie]. Bill knows [that].
 $\hookrightarrow d_{\text{prop}}$ $\uparrow d$ (\hookrightarrow : introduction, \uparrow : uptake)
- b. [_{NegP} John didn't [_{TP} t_{John} t_{did} lie]], i. and he actually can prove *it*.
 $\hookrightarrow d_{\text{prop}}$ $\hookrightarrow d'_{\text{prop}}$ ii. even though people believed *it*.

- q : just like the pronouns in (14) but silent in the syntax
 - take up a propositional DR (can be from discourse or context) as is antecedent
 - an anaphor needs an antecedent (explains why (12) is odd without context)
- *too* takes q and a proposition $\llbracket p \rrbracket$ as arguments
 - presupposition constrains the form of the antecedent (focus alternative of $\llbracket p \rrbracket$)
 - asserts that the antecedent of q is true and $\llbracket p \rrbracket$ is true

4.1.1 Computation

Example: Computing (12)

- (15) John_F is having dinner in Princeton tonight **too**.
- $\llbracket \text{too} \rrbracket(q)(\llbracket p \rrbracket)$ ($p = \text{John is having dinner in Princeton tonight}$)
 - Presupposes:
 - that q is of the form *X is having dinner in Princeton tonight* ($X \neq \text{John}$)
 - Asserts: $q_w \wedge \llbracket p \rrbracket^w$
 “In addition to q being true, John is having dinner in Princeton tonight.”

- Uttered out of blue: q cannot find an antecedent DR, so (15) is odd
- Since it is asserted that q is true, the antecedent of q must also be true in order to avoid contradictions
 - Contextual: [watching a broadcast of people dining in Princeton]
 $\hookrightarrow d_{\text{prop}}$ that entails a proposition of the form *X is having dinner...*
 - Discourse: [Jun is having dinner in Princeton tonight]
 $\hookrightarrow d_{\text{prop}}$

4.2 Semantics of *either*

PROPOSAL: Additive *either* is the **disjunctive counterpart of *too***, with its meaning identical to *too* with the exception that it asserts a disjunction.

$$(16) \quad \llbracket \text{too} \rrbracket(q)(\llbracket p \rrbracket) = \lambda w: q \in \llbracket p \rrbracket^f - \{\llbracket p \rrbracket^o\}. q_w \wedge \llbracket p \rrbracket^w$$

$$(17) \quad \llbracket \text{either} \rrbracket(q)(\llbracket p \rrbracket) = \lambda w: q \in \llbracket p \rrbracket^f - \{\llbracket p \rrbracket^o\}. q_w \vee \llbracket p \rrbracket^w$$

4.2.1 Computation

Let's first see if this gives the right results for the basic cases.

- (18) (John didn't leave.) Bill_F didn't leave **either**. (*p* = Bill left)
- a. $\neg \llbracket \text{either} \rrbracket(q)(\llbracket p \rrbracket) = \lambda w: q \in \llbracket p \rrbracket^f - \{\llbracket p \rrbracket^o\}. \neg[q_w \vee \llbracket p \rrbracket^w]$
 - b. Presupposes:
 - i. that *q* is a focus alternative of $\llbracket p \rrbracket$ different from $\llbracket p \rrbracket$ (of the form *X left*)
 - c. Asserts: $\neg[q_w \vee \llbracket p \rrbracket^w] = \neg q_w \wedge \neg \llbracket p \rrbracket^w$
 "In addition to *q* being false, Bill didn't leave."

- *q* refers to a propositional DR of the form *X left* (d' at TP-level)

$$(19) \quad \begin{array}{ccc} \llbracket \text{NegP John didn't} & \llbracket \text{TP } t_{\text{John}} t_{\text{did}} \text{ leave} \rrbracket & \neg \llbracket \text{either} \rrbracket(\mathbf{q})(\llbracket p \rrbracket) \\ \hookrightarrow d'_{\text{prop}} & \hookrightarrow d'_{\text{prop}} & \uparrow d' \end{array}$$

- This antecedent could be discourse or contextual
- Because *q* is asserted to be false, the antecedent must also be false to avoid contradictions
- The antecedent does not need to be syntactically negative as long as it entails the negation of the proposition that *q* refers to (*John stayed* is a possible antecedent)
 → Assuming that entailments of a clause can be introduced as DRs

Summary

- *Too* and additive *either* take a silent anaphor *q* and a proposition $\llbracket p \rrbracket$ as arguments
- While *too* asserts a conjunction of the two, *either* asserts a disjunction
- The discourse or contextual antecedent of *q* must be available, and it must be compatible with the resulting assertion
- Two goals for an account of additive *either*:
 - the relation between the host and the antecedent
 - *too* and *either* have the same requirements
 - captured by the proposal, summarized above
 - its restricted distribution
 - specific to *either*

$$(20) \quad * \text{Bill left either.}$$

4.3 Distribution of *either*

4.3.1 Disjunction and NPI

Either is linked to a disjunction, therefore to existentiality and indefiniteness

- cases of NPI disjunction have been attested: Aranovich (2006), Amritivalli (2003), etc.
- a more general observation is that existentials readily take an NPI behavior (*any*)
- recent developments explaining why this must be the case
 - Exhaustification based theory of NPIs
(Krifka, 1995; Lahiri, 1998; Chierchia, 2006, 2013)

4.3.2 Exhaustification based theory of NPIs

- Program of reducing NPI behavior to a grammatical process of exhaustification, which makes use of Rooth's (1985) Alternative Semantics.

The idea:

- Regular indefinites like *some* trigger scalar implicature when relevant
- This implicature arises via exhaustification through an O operator
 - agrees with the alternative-bearing element in C-commanding domain
 - affirms the prejacent and negates all non-entailed alternatives (following Rooth's approach to focus)

- (21) Some students passed the test.
- a. O[some students passed the test]
 - b. ALT = $\{\phi_{\text{some}}, \phi_{\text{all}}\}$
- O[(21)] = Some but not all students passed the test

- Alternatives of NPIs not subject to relevance: always active
 - *any* obligatorily activates its domain alternatives (DA)

- (22) *John ate any cookie.
- a. O_D[John ate any_D cookie]

- (23) Model: two cookies ($D = \{c_1, c_2\}$)
- a. Assertion: $\exists x \in D [\text{cookie}(x) \wedge \text{eat}(x)(j)]$ $c_1 \vee c_2$ (c_n : $\llbracket \text{John ate } c_n \rrbracket$)
 - b. D-ALT = $\{\{c_1, c_2\}, \{c_1\}, \{c_2\}\}$
 - c. Exhaustification: negating all non-entailed ALTs \rightarrow contradiction
(John ate c_1 or c_2 , but John didn't eat c_1 and John didn't eat c_2)

- (24) John didn't eat any cookie.
- a. Assertion: *No cookie exists such that John ate it.* $\neg c_1 \wedge \neg c_2$
 - b. All alternatives entailed: $\neg c_1, \neg c_2$
 - c. \rightarrow Vacuous Exhaustification

4.3.3 Additive *either* activates alternatives of a disjunction

Assumption: additive *either* activates the domain and scalar alternatives of a regular disjunction

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

- $ALT(\llbracket \text{either} \rrbracket_q(p)) = \{q_w \vee p_w, q_w, p_w, q_w \wedge p_w\}$

4.3.4 Computation

*Bill left either

Exhaustifying with O_{ALT} (ALT: total set of alternatives - scalar and domain):

(25) O_{ALT} [Bill left **either**]

- a. Asserts: $q_w \vee p_w$ ($p = \llbracket \text{Bill left} \rrbracket$)
- b. Alt = $\{q_w \vee p_w, q_w, p_w, q_w \wedge p_w\}$
- c. O_{ALT} [p **either**]
 $= [q_w \vee p_w] \wedge \neg q_w \wedge \neg p_w \wedge \neg [q_w \wedge p_w] = \perp$

- Because none of the alternatives are entailed by the prejacent, they must all be negated. This leads to a contradiction, thus *Bill left either* is ruled out.

Going back to Example 1

Adopting this analysis does not affect the original example:

(26) O_{ALT} [Bill didn't leave **either**]

- a. Asserts: $\neg [q_w \vee p_w]$ ($p = \llbracket \text{Bill left} \rrbracket$)
- b. Alt = $\{\neg [q_w \vee p_w], \neg q_w, \neg p_w, \neg [q_w \wedge p_w]\}$
- c. O_{ALT} \neg [p **either**]
 $= \neg [q_w \vee p_w]$

- In a negative environment, all alternatives are entailed, leading to a vacuous exhaustification that results in the prejacent we started with.

4.3.5 Summary

- the NPI distribution of *either*:
 - predicted: because *either* asserts a disjunction, and disjunction – and existentials in general – have been shown to take an NPI behavior readily
 - derived: with the exhaustification-based theory, assuming that
 - * *either* obligatorily activates its alternatives which must be exhausted
 - * exhaustification leads to a contradiction in positive contexts

5 Discussion

- Rullmann’s account had two advantages: a. symmetry between accounts of *too* and *either*
b. adjoining *either* under negation
- The present proposal keeps these advantages:
 - the symmetry is retained in a different way (“ \wedge vs \vee ” instead of “true vs false”)
 - *either* is analyzed as an NPI appearing under negation
- ...and has two additional advantages: conceptual and empirical.

5.1 Explaining the NPI nature of *either*

- **Rullmann, 2003**: there is nothing in the lexical entry of *either* that would predict the NPI behavior of *either*
- **Present Proposal**: analyzing *either* as a disjunction links it to other existentials and allows *either* to fall under a more general theory of NPIs
 - Switch from a conjunction in *too* to a disjunction in *either* also has some explanations
 - * *either* has disjunctive uses
 - determiner *either* is similar to *any* (NPI, Free Choice reading) (Rullmann, 2003)

5.2 Predicting *either*’s distribution

(27) *The paper is almost finished either.

(28) John is the only person I know who likes broccoli.

- a. ...**Nobody but John** likes tomatoes either.
- b. ...***Only John** likes tomatoes either.

- **Rullmann, 2003**: accounts for the distribution by defining a separate licensing condition
 - Licensing condition predicts (27) to be good and cannot capture the difference between (28a) and (28b)
 - But the condition cannot be modified to require syntactic negation

- (29) a. Few has been to Seoul either.
b. It is unlikely that they will visit Boston.

- **Present Proposal**: predicts the restricted distribution to follow from the assertion of a disjunction and the process of exhaustification
 - (27) is out because almost($p\vee q$) does not entail almost(p), almost(q), and almost($p\wedge q$)
 - exhaustifying leads to a contradiction
 - (28a) vs. (28b): strong NPIs (SNPIs) show similar behavior:

(30) a. Nobody but John has seen Mary **in weeks**.
b. *Only John has seen Mary **in weeks**.

- * While most NPIs appear in DE contexts, SNPIs – such as *in weeks* and punctual *until* – appear in a limited subset of DE environments
- * Chierchia (2013) introduces a way to distinguish SNPIs from NPIs within the exhaustification framework (exhaustified with respect to the enriched meaning)
- * Classifying *either* as a SNPI allows us to make the right prediction

6 Conclusion

Too and *either*: anaphoric focus particle that take an anaphor and a proposition as arguments

- *too*: asserts a conjunction

$$(31) \quad \llbracket \text{too} \rrbracket(q)(\llbracket p \rrbracket) = \lambda w: q \in \llbracket p \rrbracket^f - \{\llbracket p \rrbracket^o\}. q_w \wedge \llbracket p \rrbracket^w$$

- *either*: asserts a disjunction

$$(32) \quad \llbracket \text{either} \rrbracket(q)(\llbracket p \rrbracket) = \lambda w: q \in \llbracket p \rrbracket^f - \{\llbracket p \rrbracket^o\}. q_w \vee \llbracket p \rrbracket^w$$

- This accounts for:

(for both *too* and *either*)

- the requirement that there exist a salient parallel proposition
 - * introduction of a silent anaphor *q* as the first argument
- the form of this salient parallel proposition
 - * *q* presupposed to be a focus alternative of *p*

(for *either*)

- the NPI behavior
 - * *either* has obligatorily active alternatives that must be exhaustified
 - * as a disjunction, leads to a contradiction when in positive contexts

- Advantages:

- Relation between *too* and *either* straightforward
- Explains why *either* has an NPI distribution (general observation, independently motivated tools such as exhaustification and alternatives of a disjunction)
- Empirical coverage

6.1 Remaining questions

- Relation among three uses of *either*
- Positive antecedents and discourse referents (Krifka 2013: overt NegP required to refer to embedded TP)
- Distribution of *either* (SNPI? If so, how to derive it from its meaning)
- Cross-linguistic study

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