Additive Presuppositions and Logical Strength

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Abstract

This paper deals with the presuppositions of additive *either*. Our aim is to link the negative character of *either*'s presupposition to its being an NPI. We adopt the view that presuppositions translate as silent conjuncts whose content is taken by the interlocutors to follow from the local context and to strengthen the at-issue meaning. To explain why the presupposition of additive *either* features a negation we propose that the presuppositions of additive *either* actually originate as silent disjuncts. On the resulting analysis the negation that licenses additive *either* as an NPI is also responsible for the negation we see in its presupposition. Independent support for a disjunctive analysis of additive *either* is argued to come from the overtly disjunctive uses of *either*.

1 Introduction: Presupposition as conjunction

Presuppositions allow language to convey extra information, beyond what is spelled out explicitly. This sense of "extra information" means, in essence, that presuppositions always strengthen the at-issue meaning. One way to express the strengthening power of presuppositions is to view them as special conjuncts in logical form (e.g. Beaver and Krahmer 2001, Schlenker 2009). (Later we will say more about what "special" means.) We can informally represent this way of looking at presupposition by translating (1-a) as (1-b), where ~~strikeout~~ represents phonological silence and semantic presuppositionality.

(1) a. Anita danced again.
b. $\exists e(\sout{Dance(e,a) \wedge Past(e)}) \wedge \exists e'(Dance(e',a) \wedge Past(e') \wedge e < e')$

Apparently, we never have logical forms like (2), with a backgrounded **disjunct**:

(2) $\exists e(\sout{Dance(e,a) \wedge Past(e)}) \vee \exists e'(Dance(e',a) \wedge Past(e') \wedge e < e')$

We argue that the essential function of presuppositions to strengthen meaning is integrated into the compositional system in a way that rules out (2), but which actually — and correctly — predicts the existence of disjunctive presuppositions in certain instances.

2 The issue: Polarity in additive presuppositions

Additive expressions like *too* and the NPI *either* are known to carry focus-sensitive presuppositions, (cf. e.g. Rullmann 2003, Ahn 2015, Szabolcsi 2017). Whereas (3-b) presupposes that there is another, contextually relevant place besides Paris that Anita visited (here New York), (4-b) carries the negative presupposition that there is another contextually relevant place besides Paris to which Anita did **not** go:

(3) a. Anita went to New York.
b. She went to $[\text{Paris}]_F$ **too**. [additive *too*]
c. $\exists e(\sout{Go(e,a) \wedge To(e,NY) \wedge Past(e)}) \wedge \exists e'(Go(e',a) \wedge To(e',Paris) \wedge Past(e'))$

(4) a. Anita didn't go to New York.
b. She didn*(n't) go to [Paris]$_F$ **either**. [NPI *either*]
c. ~~$\neg\exists e(Go(e,a) \wedge To(e,NY) \wedge Past(e))$~~ $\wedge$ $\neg\exists e'(Go(e',a) \wedge To(e',Paris) \wedge Past(e'))$

The question arises as to how the focus alternative is identified and how it is used to compute the observed presuppositions. In the case of (3-b), *too* has scope over *went to [Paris]*$_F$, and so it seeks an alternative of the form *went to* LOCATION$\neq NY$. Identifying *went to New York* in the context, we produce the logical form (3-c).

Turning to (4-b), it is not immediately clear whether or not *either* has scope over the negation. If it has scope over negation, the derivation works in a way completely parallel to (3-b), identifying *not go to New York* in the context and conjoining this with the overt material to produce (4-c). However, there is a problem with assuming this derivation. NPIs always have scope under their licensors, which means that the alternatives should be non-negative (see Rullmann 2003 for arguments). In the case at hand, we should assume that *either* in (4-b) seeks an alternative of the form of the same form that *too* does, i.e. *went to* LOCATION$\neq NY$. It then produces the presupposition that this alternative is false, yielding (4-c).

From this perspective, it seems that *too* and *either* generate opposite presuppositions (cf. Rullmann 2003). But this seems that we may be missing a generalization. The derivation with the NPI *either* involves negation in two ways; it requires a licensing negation, and it negates its focus alternative. Could it be this is the same negation? We propose that it is, but it is not immediately clear how to make this proposal compatible with the idea that the additive presupposition is a backgrounded conjunct. It we introduce the conjunct at the same point in the derivation as *either*, we get the logical form (5).

(5) $\neg(\exists e(Go(e,a) \wedge To(e,NY) \wedge Past(e)) \wedge \exists e'(Go(e',a) \wedge To(e',Paris) \wedge Past(e')))$

This is clearly incorrect. If we assume that the presupposition projects, it becomes equivalent to (6), which is also incorrect.

(6) ~~$\exists e(Go(e,a) \wedge To(e,NY) \wedge Past(e))$~~ $\wedge$ $\neg\exists e'(Go(e',a) \wedge To(e',Paris) \wedge Past(e'))$

What would work better would be to assume that *either* involves a silent disjunction, as proposed by Ahn (2015). We add to Ahn's proposal the idea that the the disjunct is a unpronounced copy of the focus alternative and not part of the at-issue meaning, leading to (7):

(7) $\neg(\exists e(Go(e,a) \wedge To(e,NY) \wedge Past(e)) \vee \exists e'(Go(e',a) \wedge To(e',Paris) \wedge Past(e')))$

If de Morgan's Law applies to (7), (7) can be seen as equivalent to (8), which is the correct logical form within the notation we have been employing.

(8) ~~$\neg\exists e(Go(e,a) \wedge To(e,NY) \wedge Past(e))$~~ $\wedge$ $\neg\exists e'(Go(e',a) \wedge To(e',Paris) \wedge Past(e'))$

In sum, if additive *either* introduces its not-at-issue component as a silent disjunct provided by a distinct focus alternative we can connect the negative character of its presupposition to its status as an NPI.

3 Additional arguments for a disjunctive analysis

We can also observe additional, supporting arguments for a disjunctive analysis of additive *either*. One argument is that a disjunctive analysis is consistent with the fact that disjunction has a low scalar semantics, the kind of semantics that is typical of NPIs (cf. Ahn 2015). This argument only goes so far, however. Not all NPIs are low-scalar expressions (cf. the high-scalar NPIs *at all*, adverbial *much*), nor are all low-scalar expressions are NPIs, e.g. *a, or* are not. NPI-hood on

the analysis adopted here is an arbitrary lexical feature that semantically predisposed expression can come to bear (cf. Chierchia 2013, Herburger 2024). In other words, a low-scalar, disjunctive analysis of additive *either* fits the fact that it has the distribution of an NPI, but does not fully explain it.

A disjunctive analysis of *either* is also appealing because there is an *either* that can appear with overt *or* (cf. also Thomas 2021). When *either* appears to the left of *or* it marks the scope of the disjunction as illustrated by the different interpretations that we observe for (e.g. Larson 1985). Whereas (9-a) is a disjunction over which place they were told to go, (9-b) is a disjunction over what they were told.

(9) a. They were told to **either** go to New York **or** Paris.
b. They **either** were told to go to New York **or** Paris.

The second disjunct in instances where *either* pairs up with *or* can involve syntactic ellipsis, in particular Gapping of the non-focused material in the second disjunct, if that material is the same as in the first disjunct (Schwarz 1999). The difference in meaning we see between (9-a) and (9-b) then stems from the size of the gapped material:

(10) a. They were told to **either** go to New York **or** ~~go-to~~ Paris.
b. They were **either** told to go to New York **or** ~~told-to-go-to~~ Paris.

On the proposed analysis, the logical form of sentences with additive *either* ($either_{addNPI}$) and the overtly disjunctive *either* is rather close:

(11) a. *Anita did*(***n't***) go to New York* **either**$_{addNPI}$ iff
$\neg(\exists e Went(e,a) \wedge Past(e) \wedge To(e, NewYork_j)$
~~$\vee \exists e Went(e,a) \wedge Past(e) \wedge To(e,x_i)$~~)
b. *Anita* **either** *went to New York* **or** ~~*went to Paris*~~ iff
$\exists e Went(e,a) \wedge Past(e) \wedge To(e, NewYork_j)$
$\vee \exists e$ ~~$Went(e,a) \wedge Past(e)$~~ $\wedge To(e, Paris_i)$

They differ in that additive *either* is lexically marked as an NPI, while *either...or* is not. Another difference concerns the size and origin of the silent, presupposed material. In the case of additive *either*, the entire second disjunct is not made explicit; it is a distinct focal alternative that must be specified by the context. In the case of *either...or*, by contrast, gapping optionally extends over the non-focused part of the second disjunct when it is identical to the non-focused part of the first disjunct; it does not include the focus or the connective *or*.

Another set of structures where we see a connection between an instance of *either* and disjunction are those where *either* functions as a determiner for a dual DP. In (13), *either* functions as an NPI, (12-a). Limiting the girls to Frances and Beatrice we find that (13-a) is equivalent to the overt disjunctions (13-b).

(12) a. I didn't see either girl.
b. I didn't see either Frances or Beatrice.

In addition it can also appear as the determiner of a free choice quantifier, where it can also be paraphrased with a disjunction, (13-b).

(13) a. Either girl could have won the dance competition.
b. Either Frances or Beatrice could have won the dance competition.

In a few fixed expressions, dual *either* is better paraphrased with *and* than *or*, (14). These cases are remnants from Old English, where the determiner *either* was universal, e.g. Gast (2013).

(14) There are trees on either side of the house.

In sum, there is evidence from the broader distribution of *either* that it is closely associated with disjunction. These arguments of course do not prove that additive *either* introduces a disjunction, but in our view, they greatly add to the plausibility.

4 A context-sensitive presupposition operator

The basic idea of our analysis is that NPI *either* introduces what will become its presupposition (once it is negated) as a disjunction, and that it is turned into a negated conjunct by the licensing negation. However, there is a puzzle. In order for de Morgan's law to apply, the silent disjunct introduced by *either* must be treated as part of the propositional content that is operated on by negation. That is, at the point that negation applies, the disjunct counts as at-issue meaning. By contrast, the negation of this same material is ultimately projective; in other words, outside the syntactic scope of its licensor, it is treated as a presupposition. Thus we seem to have a contradiction: the silent disjunct is both at-issue and (once negated) presuppositional.

We propose that this equivocal behavior is a consequence of three facts:

1. The basic meaning of *either* is disjunction.
2. As *either* is an additive word, one of the disjuncts is anaphoric, unpronounced, and presuppositional.
3. Presuppositions strengthen the meaning they are a part of.

The silent disjunct of *either* must strengthen the overall meaning, but given that it is introduced as a disjunct, this is only possible once the NPI has been licensed. Thus, we need a compositional process that defers treating the silent disjunct as a presupposition until the point where it strengthens the meaning.

We can imagine several ways of formalizing the process of composition that would model this way of looking at things. One approach is to assume an operator π that applies to the disjunct, storing its argument p and treating $\neg p$ as a presupposition as soon as $\neg p$ is an entailment.

In (15), we specify how *either* introduces the silent disjunct and stores it:

(15) $\psi, (either\ \phi) =$
a. $(\pi(p) \vee q) =$
b. $\langle (p \vee q), p \rangle$

(The standard meanings of ϕ and ψ are p and q, respectively.)

The stored material p is essentially a presupposition waiting to happen; it "waits" until either it or its negation strengthens the overall meaning, and then it triggers a presupposition. This "waiting" and "triggering" process can be incorporated into the process of composition. Let us assume that function application is the only relevant rule.

(16) Function Application (with pending presupposition)
For any node $[_\alpha\ \beta, \gamma]$ and local context c, where $[[\gamma]]^c = \langle d, p \rangle$ and d is in the domain of $[[\beta]]^c$:
a. $[[\ \alpha\ ]]^c = \langle [[\beta]]^c(d), p \rangle$, if $[[\beta]]^c(d)$ entails neither p nor $\neg p$.
b. If $[[\beta]]^c(d)$ entails p:
(i) $[[\alpha]]^c$ is only felicitous if p is entailed by c; and
(ii) if felicitous, $[[\alpha]]^c = [[\beta]]^c(d)$.
c. If $[[\beta]]^c(d)$ entails $\neg p$:

(i) $[[\alpha]]^c$ is only felicitous if $\neg p$ is entailed by c; and
(ii) if felicitous, $[[\alpha]]^c = [[\beta]]^c(d)$.

In the case of *either*, it is (16)(c) that introduces the presupposition that p is false when negation applies and licenses the NPI. Note that, in (16), we treat presuppositions as pragmatic felicity conditions, though for Schlenker (2009), they are definedness conditions.

Let us apply this reasoning to (4-b).

(17) She didn't go to Paris either.
a. [[either ϕ_{NY}]]$^c = \lambda q\langle(NY \vee q), NY\rangle$
b. [[she went to Paris either ϕ_{NY}]]$^c = \langle(NY \vee Paris), NY\rangle$
c. [[not (she went to Paris either ϕ_{NY})]]^c: Apply (16-c)
$\neg(NY \vee Paris)$ entails $\neg NY$, so
i. [[not (she went to Paris either ϕ_{NY})]]^c is only felicitous if c entails $\neg NY$; and
ii. if felicitous, [[not (she went to Paris either ϕ_{NY})]]$^c = \neg(NY \vee Paris)$

The same general form of explanation applies to additive *too* as well. In this case, the additive introduces a conjunction, and the presupposition is triggered as soon as the overt conjunct is combined with the covert one:

(18) She went to Paris too.
a. [[too ϕ_{NY}]]$^c = \lambda q\langle(NY \wedge q), NY\rangle$
b. [[she went to Paris too ϕ_{NY}]]^c: Apply (16-b)
$(NY \wedge Paris)$ entails NY, so
i. [[she went to Paris too ϕ_{NY}]]^c is only felicitous if c entails NY; and
ii. if felicitous, [[she went to Paris too ϕ_{NY}]]$^c = (NY \wedge Paris)$

Another way to understand our basic idea has a more syntactic, "constructional" character. Suppose we think of the an NPI and its licensor as two parts of one meaningful object, so that (in the case at hand), we interpret the *not... either* combination in stages. At the lower level, *either* introduces p into the derivation, but it cannot fully incorporate it into the meaning yet, because the the construction is not yet complete. When negation is introduced, it negates p along with the overt material; then, since the construction is complete, $\neg p$ can be fully integrated into the overall meaning. Since it is presuppositional, it must strengthen, and so it is incorporated as a conjunct. We do not attempt to formalize this way of looking at the relation between *either* and its licensor, for reasons of space.

5 Conclusion and open issues

We have argued that presuppositions are backgrounded propositions that have the core function of strengthening the at-issue meaning. In the case of additives, lexical information determines whether the presupposition will be present in a conjunction or a disjunction. When it is a disjunction, as a practical matter the item must occur in a negative context, so that it can strengthen the overall meaning. In other words, we explain the connection between additivity, disjunctive lexical meaning, and NPI-hood. These findings therefore contribute to the larger goal of explaining how presuppositions arise and how they are related to both lexical and grammatical meaning.

We have also sketched a compositional process that instantiates the analysis. It is, of course, an open question how to extend this approach to other types of presuppositions. One obvious

place to start is with the related additive element *neither*. This element has a very specific syntax in mainstream (prescriptive) English, requiring negative inversion, as in (19). In some colloquial varieties, it is a negative concord term.

(19) (Anita didn't go to New York.) Neither did she go to [Paris]F.

In addition to being an additive, *neither* also occurs as the scope marker in *neither…nor*. Thus (20-a) and (20-b) are similar to the corresponding cases with *either*, (10-a) and (10-b).

(20) a. They were told to **neither** go to New York **nor** ~~go-to~~ Paris.
b. They were **neither** told to go to New York **nor** ~~told-to-go-to~~ Paris.

In terms of our analysis, additive *neither* could be seen as introducing either a conjunction of two negative propositions or a disjunction of non-negative ones that needs a higher negation. Both approaches face challenges in assigning the correct polarity to each piece. If we choose the conjunctive analysis, we must explain why the two conjuncts are negated. If we assume the disjunctive analysis, we must explain why the negative sentence $\neg p$ in the context counts as an antecedent for the non-negative disjunct p under the scope of negation $\neg(p \vee q)$. The puzzle similar to the one encountered with *either*. We would like to be able to formalize the intuition that the semantic negation contributed by *neither* takes scope over the disjunction.

Other languages divide the space of additives differently. We find for instance that Spanish *tampoco* can translate as *neither*, which it does in preverbal position, or as additive *either*, as we can observe in postverbal position.

(21) a. Tampoco fue a Paris.
TAMPOCO went to Paris
'Neither did s/he go to Paris.'
b. *(No) fue a Paris tampoco.
not went to Paris TAMPOCO
'S/he didn't go to Paris either.'

The apparent ambiguity of *tampoco* makes it part of a more general phenomenon, negative concord. We believe that the ambiguity we observe with *tampoco* may offer a clue as to how to treat the relation between *neither* and the NPI *either*, and more generally about how polarity and presupposition interact in additive expressions.

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