A NEW TAKE ON SHIELDING AND LOCALITY OF ANTI-LICENSING OF PPIS

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Overview In certain languages, disjunctions exhibit PPI behavior, which Szabolcsi (2002) argues can be diagnosed via the following four properties: (i) **anti-licensing** – they cannot be interpreted in the scope of a clausemate negation (only a wide scope interpretation is available) (1a), (ii) **rescuing** – they are acceptable in the scope of an even number of negative operators (1b), (iii) **shielding** – they are acceptable under a clausemate negation if a certain kind of element intervenes (1c), and (iv) **locality of anti-licensing** – they are acceptable in the scope of an extra-clausal negation (1d). I demonstrate this with Hungarian *vagy* (data from Szabolcsi).

(1) a. Nem csuktuk be az ajtót vagy az ablakot.
'We didn't close the door or the window.'
(i) I don't know which.
(ii) *neither
b. Nem hiszem, hogy János ne evett vagy dohányzott volna.
'I don't think that John didn't eat or smoke.'
(*Lit:* I don't think that John didn't eat and I don't think that he didn't smoke.)
c. János nem hívta fel mindig Katit vagy Marit.
'John didn't always call Kati or Mari'
d. Nem hiszem, hogy becsuktuk volna az ajtót vagy az ablakot.
'I don't think we closed the door or the window.'
(i) I don't know which.
(ii) I don't think we closed the door and I don't think we closed the window.

In recent work, Nicolae (2015) argues that what distinguishes PPI disjunctions from polarity insensitive disjunctions is the fact that PPI-disjunctions obligatorily trigger epistemic inferences. This analysis, however, is only able to account for the first two PPI properties, namely anti-licensing by a negative operator and rescuing, and in fact wrongly predicts that PPI disjunctions should be unacceptable in the scope of a negative operator, regardless of its locality wrt the disjunction.In the talk we will propose a new take on the question of why PPIs are acceptable under non-local negation, a solution which will be shown to piggy-back on the solution we provide for the third property above, shielding, a property that Nicolae does not address.

Nicolae's (2015) PPI disjunction proposal: Following previous work on disjunction (cf. Sauerland (2004), Fox (2007), Chierchia (2013), a.m.o.), disjunction is argued to activate sub-domain alternatives, (2a). Borrowing from the grammatical theory of implicatures (Chierchia et al., 2012), implicatures are taken to be the result of a syntactic ambiguity resolution in favor of an LF which contains a covert exhaustivity operator $\mathcal{E}xh$, (2b). Observe that this exhaustifier only negates alternatives which are innocently excludable (IE), namely those whose negation will not lead to a contradiction (Fox, 2007).

(2) a. $\mathcal{A}lt_D(p \vee q) = \{p, q\}$
b. $\mathcal{E}xh(p) = p \wedge \forall q \in \textbf{IE}(p, \mathscr{A}lt(p))[p \not\subseteq q \rightarrow \neg q]$
where: $\textbf{IE}(p, \mathcal{A}lt(p)) = \lambda q.\neg\exists r \in \mathcal{A}lt(p)$ s.t. $(p \wedge \neg r) \rightarrow q$.

Nicolae (2015) moreover assumes, following Meyer, that ignorance implicatures can be derived in the grammar. Assertively used sentences are taken to contain a covert doxastic operator which is adjoined at the matrix level at LF (cf. Chierchia (2006); Alonso-Ovalle and Menéndez-Benito (2010)), represented as a necessity modal below. What this means then is that exhaustification proceeds with respect to the alternatives in (3a), delivering the enriched meaning in (3b); this amounts to the epistemic inference that "The speaker doesn't know which of the disjuncts is true." Note that in the scope of negation, this inference disappears since the exhaustification is vacuous as the alternatives are entailed by the assertion.

(3) $\mathcal{E}xh_D[\neg[p \vee q]]$
a. $\mathcal{A}lt_D(\Box(p \vee q)) = \{\Box p, \Box q\}$
b. $\mathcal{E}xh_D[\Box(p \vee q)] = \Box(p \vee q) \wedge \neg\Box p \wedge \neg\Box q$

(4) $\mathcal{E}xh_D[\Box\neg[p \vee q]]$
a. $\mathcal{A}lt_D(\Box\neg[p \vee q]) = \{\Box\neg p, \Box\neg q\}$
b. $\mathcal{E}xh_D[\Box\neg[p \vee q]] = \Box\neg[p \vee q]$

Nicolae's claim is that the vacuous application of $\mathcal{E}xh$ in (4) is responsible for the unacceptability of PPI disjunctions in the scope of negation. Her analysis takes PPI disjunctions, unlike polarity insensitive disjunctions, to trigger obligatory exhaustification of their domain alternatives. Coupled with an economy condition on exhaustification, (5), which requires the insertion of $\mathcal{E}xh$ to give rise to a strengthened meaning, the unacceptability of PPI-disjunction in the scope of negation falls out straightforwardly. In UE contexts the exhaustification gives rise to an epistemic inference, (3b), while in DE contexts the exhaustification is vacuous, hence the unavailability of a narrow scope interpretation for PPI-disjunctions.

(5) An occurrence of $\mathcal{E}xh$ in a given sentence *S* is not licensed if eliminating this occurrence leads to a sentence *S'* such that *S'* entails or is equivalent to *S*. (Fox and Spector, 2009)

This analysis can furthermore capture the second property of PPIs. Rescuing by a second negation can be accounted for straightforwardly once we observe that being embedded under two DE operators is equivalent to being in a positive environment for the purposes of exhaustification: (i) the alternatives are stronger than the assertion, and (ii) the domain exhaustification leads to strengthening.

The problem with this account, however, is that it wrongly predicts PPIs to also be unacceptable in the scope of a non-local disjunction, contrary to what (1d) shows. Nicolae suggests a solution for this problem that involves two levels of recursive exhaustification, below and above the matrix negation, which however turns out to be quite stipulative. In the following we propose a new take on this problem, which piggy-backs on the solution we provide for the third property of PPIs, shielding, a property that Nicolae does not address.

Shielding: According to Szabolcsi (2002) elements that can shield a PPI from a c-commanding negation include universal quantifiers (*always*, *everyone*) and conjunction. The generalization that can been drawn is that a universal quantifier, being in the scope of negation, gives rise to an implicature, and this implicature is somehow able to salvage the otherwise illicit configuration. Consider the schematic LF in (6), where a disjunction occurs in the scope of a universal, which itself occurs in the scope of a negation. We claim that the $\mathcal{E}xh$ operator associates with both the universal and the disjunction, resulting in the set of alternatives in (6a). The only IE alternatives are the first three in (6a), and their negation results in the strengthened meaning in (6b).

(6) $\mathcal{E}xh[\neg\forall x[p(x) \vee q(x)]]$
a. $\mathcal{A}lt(\neg\forall x[p(x) \vee q(x)]) = \{\neg\exists x[p(x) \vee q(x)], \neg\exists x[p(x)], \neg\exists x[q(x)], \neg\forall x[p(x)], \neg\forall x[q(x)]\}$
b. $\mathcal{E}xh[\neg\forall x[p(x) \vee q(x)]] = \neg\forall x[p(x) \vee q(x)] \wedge \exists x[p(x)] \wedge \exists x[q(x)]$

We conclude then that a simple extension of Nicolae's (2015) proposal can account for the shielding property of PPIs, once we assume that the $\mathcal{E}xh$ operator associating with the disjunction cannot skip and in fact must also take into consideration any intervening scalar elements (cf. Gajewski (2011) and Chierchia (2013) for a similar proposal for intervention with NPIs).

Non-local negation: In the following we will argue that the locality condition can be subsumed under the shielding condition as follows: the reason why PPI disjunctions can occur in the scope of a non-local negation is due to the nature of the embedding attitude verb, which denotes a universal quantifier over possible worlds (Hintikka, 1969).

(7) a. Marie n'est pas sûr que Paul invite Pierre ou Julie à dîner.
'Marie is not sure that Paul (will) invite(s) Peter or Julie for diner'

b. Marie ne croit pas que Paul ait invité Pierre ou Julie à dîner.
'Marie doesn't believe that Paul invited Pierre or Julie for dinner.'

The analysis then proceeds as in the case of the shielding cases above. For a sentence such as (7a), the application of the $\mathcal{E}xh$ operator will lead to the implicature that there is a world in Marie's doxastic worlds where Paul did invite Pierre or Julie to dinner. Nothing more needs to be said about this case. A slightly more complex case is provided by the neg-raising predicate *believe* in (7b). We follow Romoli (2013) who takes neg-raising predicates like *believe* to activate a different alternative, namely the excluded middle proposition, which we illustrate in (8b) both for the disjunction and the individual disjuncts. The result of exhaustification wrt these alternatives is provided in (8b). It's clear to see that here, as before, taking the $\mathcal{E}xh$ operator to associate with both sets of alternatives simultaneously (that of the attitude predicate and those of the disjunction), allows us to deliver a strengthened meaning, thereby satisfying the condition on exhaustification provided in (5).

(8) $\mathcal{E}xh[\neg\Box[p \vee q]]$

a. $\mathcal{A}lt(\neg\Box[p \vee q]) = \{\neg[\Box[p \vee q] \vee \Box\neg[p \vee q]], \neg[\Box p \vee \Box\neg p], \neg[\Box q \vee \Box\neg q]\}$

b. $\mathcal{E}xh[\neg\Box[p\vee q]]] = \neg\Box[p\vee q]]\wedge[\Box[p\vee q]\vee\Box\neg[p\vee q]]\wedge[\Box p\vee\Box\neg p]\wedge[\Box q\vee\Box\neg q] = \Box\neg[p\vee q]$

Open problems: Spector (2014) discusses complex disjunctions like *soit soit*, which he argues are global PPIs, meaning that they are unacceptable in the scope of negation, regardless of its locality. The difference between simple and complex disjunction, he argues, is that complex disjunctions cannot prune their scalar alternative. If we employ the same mechanism as above, we predict that complex disjunctions should also be sensitive to shielding (i.e. be acceptable under negation if a universal intervenes), given the implicature derived in (9b).

(9) $\mathcal{E}xh[\neg\forall x[p(x) \vee q(x)]]$

a. $\mathcal{A}lt = \{\neg\exists x[p(x)\vee q(x)], \neg\exists x[p(x)\wedge q(x)], \neg\exists x[p(x)], \neg\exists x[q(x)], \neg\forall x[p(x)], \neg\forall x[q(x)]\}$

b. $\mathcal{E}xh[\neg\forall x[p(x) \vee q(x)]] = \neg\forall x[p(x) \vee q(x)] \wedge \exists x[p(x) \wedge q(x)]$

The next question will be to check whether this prediction is borne out, something that Spector does not himself discuss. Not only do we predict that shielding should be observed with global PPIs, but also that they too should be sensitive to the locality of negation, namely that they should be acceptable under a non-local negation. Note, however, that (10) is unacceptable on a narrow scope reading of disjunction.

(10) Marie ne pense pas que Jacques ait invité soit Anne soit Paul à dîner.
'Marie don't think that Jacques invited soit Anne soit Paul for dinner'

As it stands, we leave this as an open problem, but suggest that a possible solution might be to claim that whereas the exhaustification operator associating with simple disjunction PPIs can look at alternatives other than those induced by the PPI, the exhaustification operator associating with complex/global disjunctions cannot. This is purely a stipulation and in future work we aim to derive this from the other differences between global and non-global PPIs.

References: Chierchia (2013): *Logic in Grammar*; Chierchia, Fox & Spector (2012): *Scalar implicatures as a grammatical phenomenon*; Fox (2007): *Free Choice Disjunction and the Theory of Scalar Implicatures*; Fox & Spector (2009): *Economy and embedded exhaustification*; Gajewski (2011): *Licensing strong NPIs*; Hintikka (1969): *Semantics for propositional attitudes*; Meyer (2013): *Ignorance and grammar*; Nicolae (2015): *Simple disjunction PPIs*; Romoli (2013): *A scalar implicature-based approach to neg-raising*; Sauerland (2004): *Scalar implicatures in complex sentences*; Spector (2014): *Global PPIs and obligatory exhaustivity*; Szabolcsi (2002): *Hungarian disjunctions and positive polarity.*