Redundancy and Embedded Exhaustification

- **Background** The distinction between pragmatic and grammatical theories of (scalar) implicature is a much discussed topic in recent theoretical and experimental literature. In matrix positions, the operator *exh* (a kind of silent *only*; Fox 2007) can be seen as a shortcut to the pragmatically strengthened meaning of *S*. But this correlation breaks down in embedded contexts [...[*exh* *S’*]]: Embedded *S’* is not asserted, therefore pragmatic maxims don’t apply. Thus, proponents of the grammatical theory have yet to uncover the principles underlying the distribution of embedded *exh*. This talk makes a novel contribution to this research question. We propose that the distribution of embedded exhaustification falls out of a more general theory of structural redundancy, centered around a precise formalization of (Gricean) Brevity.

- **Proposal** We posit that Brevity is to be formalized as structural competition between LFs.

(1) LF \( \phi \) is ruled out if \( \exists \psi \in \mathit{COMP}(\phi) : [\psi] = [\psi] \)  
\( \psi \in \mathit{COMP}(\phi) \) iff \( \psi \) is less-complex-than \( \phi \) (cf. Katzir 2007)

- **Problem 1:** Intuitively, additional complexity (e.g., as introduced by *exh*) should only be licensed if it is non-vacuous in a tree \( \phi \). But consider (2):

(2) a. John talked to Mary or Sue or both  
   Schematically: [M or S] or [M and S] \( \equiv \) [M or S]  

   b. \( \text{[exh}[M \text{ or } S, \text{ or } M \text{ and } S]]_\phi \)

   Standardly, Hurford’s constraint (HC) is thought to force the LF in (2-b) (Gazdar 1979, Chierchia, Fox, Spector 2009). But *exh* is overall vacuous in (2-b). Moreover, the whole tree \( \phi \) is equivalent to its subtree \( \alpha \) (independently of embedded *exh*). To account for overall vacuous *exh*, F&S (2009,2013) propose an Economy condition specifically for embedded *exh*, requiring it to be *incrementally* (not globally) *non-vacuous*1. This licenses (but doesn’t force – HC is still needed) the LF in (2-b). But as F&S observe, this condition is also satisfied in (3) – *exh* is incrementally non-vacuous within the HC-obeying LF1. Yet, the sentence is infelicitous (Gajewski&Sharvit 2012):

(3) # John didn’t talk to Mary or Sue or both  
   F&S have to further modify their condition and license *exh* only if it is non-weakening. Our general Brevity constraint (1) correctly distinguishes between (2) and (3), which is predicted to be ruled out under any LF. If a covert assertoric operator *Ass* (a universal epistemic; Alonso-Ovalle&Menéndez-Beníto 2010) is assumed, this result can be derived without HC. In addition, the seeming overt redundancy of (2-a) is shown to be licensed by implicatures no simpler structure would have.

(4) a. *exh* *Ass* [[*exh*[M or S] or [M and S]]]  
   Only licensed LF for (2-a)

   b. *COMP*(4-a) = { *Ass*[[*exh*[M or S] or [M and S]]], *exh* *Ass*[[M or S] or [*exh*[M or S] or [M and S]]] }  
   \( \checkmark \) Brevity

   c. *COMP*(3) = { ( ( *Ass* ) Neg[M or S] ) }  
   \( \checkmark \) Brevity: [[( *Ass* ) Neg[M or S]]] = [[( *Ass* ) Neg[[*exh*[M or S] or [M and S]]]]

- **Problem 2:** Embedded *exh* may be weakening under special phonological marking:

(5) a. John didn’t talk to [Mary ORF Sue]_\text{DisjP}  
   \( \equiv \) \( \neg [\text{exh}[\text{M or S}]] \)

   b. *exh*₂ [Neg [[*exh*₁[M or S]]]  
   \( \equiv \) [M\text{S}]

To maintain that embedded *exh* may never be (incrementally) weakening, F&S have to assume the LF in (5-b), and stipulate the sets *ACT*₁ = { (A and B) } for *exh*₁ and *ACT*₂ = { Neg(A or B) } for *exh*₂.2 To account for the obligatory focus on *or* under reading (5-a), additional constraints on narrow (as in (5-a)) vs. broad focus (F-marking on DisjP) become necessary: Roughly,

1 *exh* at position \( l \) is incrementally non-vacuous iff there is a continuation C after \( l \) s.t. *exh* is not globally vacuous under C. E.g., let C be or he talked to nobody in (2-a).

2 Under the null hypothesis that *ACT*₂ contains all Katzir-alternatives less-or-equally complex alternatives to *exh*₂’s prejacent (roughly: those derived by deletion and/or terminal node substitution; Katzir 2007), in particular, [A
only narrow focus licenses the needed sets $\mathcal{ALT}_{1,2}$. But the reading in (5-a) is not sufficiently characterized by phonetic focus (pitch accent) on or (s. (6-a)). It requires contrastive topic (CT) intonation with the structure shown in (6-c) (Pierrehumbert 1980 et seq., Büring 2003):

6. a. John didn’t talk to Mary OR$_H$. Sue$_{L,H\%}$ $\mathbf{\checkmark}$ –(M or S), $\mathbf{\checkmark}$ –[exh(M or S)]
   b. John didn’t talk to Mary OR$_{L,H\%}$. Sue$_{L,H\%}$ $\mathbf{\checkmark}$ –[exh(M or S)], $\mathbf{\checkmark}$ –(M or S)
   c. John did not talk to Mary OR$_{CT}$. Sue

**Our Brevity correctly predicts the LF $\text{Neg}[\text{exh}[M \text{ or } S]] = [(\neg M \land \neg S) \lor (M \land S)]$ to be licensed (s. (5-a)).** We follow Büring (2003) in assuming an openness presupposition for CT-intonation. Only the LF containing embedded exh can satisfy this presupposition: $[\text{Neg}][\text{exh}[M \text{ or } S]]^{CT} = \{M \land S, M \text{ and } S\}$, only $[\text{Neg}][\text{exh}[M \text{ or } S]]$ but not $[\text{Neg}[M \text{ or } S]]$ leaves open $A$ and $S$?. The obligatory CT-contour is explained by Heim’s *Maximze Presupposition* (Heim 1991). F&S’s observation that (5-a) in fact implies $(M \land S)$ is derived independently in context: The *QUD* it addresses has an existential presupposition (Comorovski 1996), ruling out $(\neg M \land S)$.

**Problem 3:** The non-brief (7-a) is not ruled out by the seemingly equivalent but briefer (7-b) (Schlenker 2009, Mayr&Romoli 2013):

7. a. Either Mary studied math, or she didn’t and she studied physics $\equiv [M \text{ or } P]
   b. Either Mary studied math or she studied physics $\equiv [M \text{ or } P]

In accounting for the apparently redundant [not M] (= or she didn’t) in (7-a), M&R’s propose constraints which predict both LF1 and LF2 to be licensed:

8. a. LF$_1$ exh [C or [not C and A]] $\equiv [M \lor P]
   b. LF$_2$ [exh C] or [not C and A] $\equiv (M \land \neg \neg P) \lor (\neg M \land P)

But exh is vacuous in LF1 – it can only exclude the contradictory alternative [M and (not M and P)]. LF2 is equivalent to an exclusive disjunction under any standard definition of $\mathcal{ALT}$. In order to warrant LF1 in addition, M&R claim that sentences like (9) should be (contextually) inconsistent if only LF2 were available:

9. John lives in Paris or he doesn’t but he still lives in France

We show that vacuous exhaustification as in LF1 is not necessitated by (9). (9) is not on a par with (7-a). The former has no felicitous simpler counterpart (cf. # John lives in Paris or in France) and differs in (pragmatic) meaning. **Our (1) correctly predicts that (7-a) and (9) should be licensed, but predicts different LFs for the two types of sentences.** The non-HC version in (7-a), but not (9) only has an exclusive reading, which we will show to be correct. The predicted LFs are the following:

10. a. (exh Ass) [exh C] or [not C and A] Only licensed LF for (7-a)
   b. (exh Ass) P or [not P and F] Only licensed LF for (9)

(10-b) states that the speaker is certain that F, not certain that P and not certain that not-P. This is not a meaning a simpler (but infelicitous!) competitor (e.g. exh Ass[P or F]) can have. Importantly, this result presupposes that exh has access to world knowledge. We will see that Magri’s facts and simple HC violations can still be derived (Magri 2009, 20011; cf. Spector 2014).


and B) and [A or B], exh$_2$ is vacuous and F&S’s economy condition is violated again, making (5-a) even more problematic.

3 M&R rely on this result and derive it from an independent constraint on $\mathcal{ALT}$ (Fox 2007, Chemla 2010), roughly: In construing $\mathcal{ALT}$$\langle\phi\rangle$, generate $\psi \in \mathcal{ALT}$$\langle\phi\rangle$ by deletion. $\rho \in \mathcal{ALT}$$\langle\phi\rangle$ iff $\rho$ can be derived from $\psi$ by further substitution of terminal node $\psi$ and if $\psi = \rho$. Importantly, the present account rules out LF1 even if this constraint, whose status is unclear (Spector 2007), is not assumed.

4 Assume the null hypothesis that $\mathcal{ALT}$ in LF2 contains the second disjunct and all its less- or-equally- complex alternatives: $\mathcal{ALT} = \{(\text{not } M \text{ and } P), (\text{not } M \text{ or } P), \text{not } M, M, P\}$. All but M are innocently excludable in the sense of Fox (2007), therefore, $[\text{exh } M] = (M \land \neg P)$. The same result is obtained with the restricted set $\mathcal{ALT} = \{P\}$, which is the one discussed by M&R.