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 ϕ is ruled out if $\exists\psi \in \mathcal{COMP}(\phi)$: $[\![\phi]\!] = [\![\psi]\!]$ **Brevity**
$\psi \in \mathcal{COMP}(\phi)$ iff ψ is less-complex-than ϕ (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 ϕ. But consider (2):

(2) a. John talked to Mary or Sue or both Schematically: [M or S] or [M and S]
b. $[exh[\text{M or S}]_\alpha]$ or $[\text{M and S}]]_\phi$ $\equiv$ [M or S]

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 ϕ is equivalent to its subtree α (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 **LF1** Neg [*exh*[M or S] or [M and S]]

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-Benito 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. $\mathcal{COMP}$(4-a) = {*Ass*[[*exh*[M or S]] or [M and S]]], *exh Ass*[*exh*[M or S], *exh Ass* [[M or S], *exh Ass* [[M or S] or [M and S]]} ✓ **Brevity**
c. $\mathcal{COMP}$(3) = {. . . (*Ass*)Neg [M or S]. . . } ↯ **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 OR_F Sue]$_\text{DisjP}$ $\equiv \neg[exh(\text{M or S})]$
b. exh_2 [Neg [exh_1[M or_F S]]] $\equiv$ (M∧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 $\mathcal{ALT}_1$ = {(A and B)} for exh_1 and $\mathcal{ALT}_2$ = {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 $\mathcal{ALT}_2$ 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 $\text{OR}_{\text{H*}}$ $\text{Sue}_{\text{LL\%}}$ ✔ ¬(M or S), ✘ ¬[*exh*(M or S)]
b. John didn't talk to Mary $\text{OR}_{\text{L+H*}}$ $\text{Sue}_{\text{LH\%}}$ ✔ ¬[*exh*(M or S)], ✘ ¬(M or S)
c. John did not_{F} talk to Mary or_{CT} Sue

Our Brevity correctly predicts the LF Neg[*exh*[M or S]] =[(¬M∧¬S)∨(M∧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: $[\![\text{Neg}_{\text{F}}[exh[\text{M or}_{\text{CT}}\ \text{S}]]]\!]^{CT}$={*M or S?, M and S?*}, only ⟦Neg[*exh*[M or S]⟧ but not ⟦Neg[M 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∧S) is derived independently in context: The $\mathcal{QUD}$ it addresses has an existential presupposition (Comorovski 1996), ruling out (¬M∧¬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 $\stackrel{?}{\equiv}$ [M or P]
b. Either Mary studied math or she studied physics = [M 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. **LF1** *exh* [C or [not C and A]] ≡ (M ∨ P)
b. **LF2** [*exh* C] or [not C and A] ≡ (M ∧ ¬ P) ∨ (¬M ∧ P)

But *exh* is vacuous in LF1 – it can only exclude the contradictory alternative [M *and* [not M and P]).[3] LF2 is equivalent to an exclusive disjunction under any standard definition of $\mathcal{ALT}$.[4] 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).

Selected References Fox&Spector (2009,2013): *Economy & Embedded Exhaustification*, Ms. Mayr&Romoli (2013): *Redundancy and the Notion of Local Context*, Ms. Gajewski&Sharvit (2012): *Nat Lang Sem* 20. Katzir (2007): *L&P* 30. Schlenker (2009): *S&P* 2. Fox (2007): In ed. Sauerland& Stateva. Spector (2014): *Scalar Implicatures, Blindness, and Common Knowledge* Ms.

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 $\mathcal{ALT}(\phi)$, generate $\psi \in \mathcal{ALT}(\phi)$ by deletion. $\rho \in \mathcal{ALT}(\phi)$ iff ρ can be derived from ψ by further substitution of terminal node ν <u>and</u> if $\psi \not\models \rho$. 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: $\mathcal{ALT}$ = {(not M and P), (not M or P), not M, M, P}. All but M are innocently excludable in the sense of Fox (2007), therefore, ⟦*exh* M⟧= (M∧¬P). The same result is obtained with the restricted set $\mathcal{ALT}$ = {P}, which is the one discussed by M&R.