

Recent developments in formal pragmatics

Part 2/3: The Grammatical Theory

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The grammatical theory was developed by Chierchia (2006) and Fox (2007) . . . It attributes implicature computation to a silent grammatical operator . . . *Exh* or *O* . . . (Sauerland 2012)

- Implicatures sometimes need to be computed in embedded positions; conversational implicatures can be generated by sub-parts of sentences (Fox and Spector 2018: 2; Potts 2012)
- *Exh* is free to apply to embedded propositions (Sauerland 2012)

1 Key evidence

. . . the facts suggest that SIs are not pragmatic in nature but arise, instead, as a consequence of semantic or syntactic mechanisms, . . . (Chierchia, Fox and Spector 2012: 2316)

The evidence in favor of embedded exhaustification comes in two main forms, both of which involve cases where an argument proposition arguably includes a scalar implicature:¹

- the proposition is the argument of a modal function, such as an attitude or a generic or conditional operation,
- the proposition is a disjunct.

¹“CFS’s argument is mainly based on intrusive implicatures: cases where the implicature seems to be incorporated into the argument to a truth-functional operator in order to maintain consistency.” (Potts 2013: 26)

1.1 Attitudes, conditionals, generics

Consider (1)–(3):

- (1) “Hva synes Atle om ‘Le Bureau’?” “Han synes den er bra.”
what thinks Atle of Le Bureau he thinks it is BRA
↪ Atle thinks ‘Le Bureau’ is not *very* good
- (2) (Debate: Should marijuana be legalized?) Sure, there will always still be some around, but surely some is better than a lot?
↪ surely some, not a lot is better than a lot
- (3) Don’t use up all your carrots. It recharges quicker if you’ve used some of them, than if you’ve used all of them.
↪ It recharges quicker if you’ve used some but not all of them

Indeed, (2) and (3) are arguably contradictory if *some* is read at face value.

1.2 Disjunctions

Consider (4) and (5):

- (4) The monogenesis hypothesis posits that a single language . . . was ancestral to most or all of the Atlantic creoles.
- (5) you need to specify the direction by a preposition or a prefix or both

Unless *most* is read as ‘most, not all’, and *or* is read as exclusive, these two cases should fall victim to **Hurford’s constraint** (Hurford 1974):

The joining of two sentences by *or* is unacceptable if one sentence entails the other; otherwise the use of *or* is acceptable.

But since they *are* acceptable, (6b)/(7b) is evidently not understood to be entailed by (6a)/(7a):

- (6) a. A single language was ancestral to all of the Atlantic creoles.
b. A single language was ancestral to most of the Atlantic creoles.
(↪ it was not ancestral to all of them)
- (7) a. you specify the direction by a preposition and a prefix
b. you specify the direction by a preposition or a prefix
(↪ you do not specify it by both)

2 The canonical theory

The reviewed evidence provides motivation for an exhaustification operator.

Under the Neo-Gricean Theory, scalar implicatures are computed on the basis of principles that regulate the choice of communicative acts, and therefore do not apply to sub-constituents of a sentence. By contrast, under the Grammatical Theory there is – within grammar – an implicature-computing operator, and, if no . . . , there should be no ban on embedding this operator . . . (Fox and Spector 2018: 2)

Here is the canonical definition of the exhaustification operator:

(8) **Exhaustification operator *Exh***

$$Exh_{Alt}(p) \equiv p \wedge \forall q \in Alt : [p \not\Rightarrow q] \Rightarrow \neg q$$

Here *Alt* is the set of alternatives to the sentence *p*.

The distribution of *Exh* is constrained by an Economy Condition, informally:

(9) **Economy Condition on *Exh***

An occurrence of *Exh* in a sentence *S* is not licensed if eliminating this occurrence leads to a sentence *S'* which entails or is equivalent to *S*.
An occurrence of Exh is licensed only if it leads to strengthening.
 (Nicolae 2017: 7)

– In other words, *Exh* should not be semantically vacuous. Consequently, it should be illicit in the scope of a scale-reversing operator unless this operator is itself embedded under a non-upward-entailing operator (Crnič 2012: 548).

→ (So GT is not all grammatical and local but partly pragmatic and global (Potts 2013))

(10) and (11) are cases in point:

(10) I do not often agree with John Kenneth Galbraith, but . . .

↗ it is not the case that I often, not always agree with him

(11) Hver gang jeg dater en mann som er litt ålreit blir jeg . . .
 every time I date a man that is bit alright become I . . .

↗ every time I date a man who is only just better than average,

Strengthening under negation or in \forall restrictors leads to overall weakening.

Another context where *Exh* should not be licensed is when a sentence with a low scalar item is conjoined with a sentence with the negation of a higher scalar item, as in (12):

(12) Most lay eggs, but not all do.

↗ most but not all lay eggs but not all do – or perhaps better:

Exh(most lay eggs) but not all do

As conceded by Chierchia, Fox and Spector (2012: 2317),

there is nothing that forces the presence of the operator *O* in a sentence containing a scalar item. Optionality is thus predicted, and the correlation with various contextual considerations can be captured under the standard assumption . . . that such considerations enter into the choice between competing representations (those that contain the operator and those that do not).

However, there are still problems, or there is still a need for refinements.

3 Problems or refinements

The grammatical theory faces challenges, some to do with overgeneration, calling for a stronger Economy Condition, some to do with undergeneration, calling for a weaker condition. Also, some key evidence has been challenged.

3.1 Singh's asymmetry and incrementality

Singh (2008) observed that although a case like (13a) gets around Hurford's constraint (see (4) and (5)), it becomes infelicitous if the order is reversed:²

(13) a. . . . that means either 14 of the 15 Lauryn songs got at least one ten . . . or all of them did.

b. #. . . that means either all of the 15 Lauryn songs got at least one ten . . . or 14 of them did.

²Actually, the contrast could be less clear here than in Singh's example (i)/(ii):

(i) John ate some of the cookies or he ate all of them

(ii) #John ate all of the cookies or he ate some of them

Here is an example where the b version is authentic:³

- (14) a. ...and Robert or John or both of them lifted William's hand out of bed and guided the same to the will and ...
 b. #...and Robert and John or one of them lifted William's hand out of bed and guided the same to the will and ...

Singh proposes to account for this contrast by imposing an asymmetric redundancy constraint on disjunctions, but Fox and Spector (2018) propose to account for it by an incremental economy condition on *Exh*, (15).

(15) **Economy Condition on *exh***

An occurrence of *exh* in a sentence S is not licensed if this occurrence ... is incrementally vacuous in S.

An occurrence of *exh* which takes A as argument is *incrementally* vacuous in a sentence S if it is globally vacuous for every continuation of S at point A.

An occurrence of *exh* is *globally* vacuous in a sentence S if eliminating it does not change truth conditions.

Note that the 'good' Hurford disjunctions, like ... *some... or all...*, in fact violate (Hurford's constraint or) (9), *exh(some...)* being globally vacuous, but not (15), while the 'bad' ones, like ... *all... or some...*, do violate (15), because at point A = *some...*, the truth conditions for S are the same with as without *exh(·)* no matter how S continues.

This way to account for Singh's asymmetry makes the correct prediction that when the two disjuncts involve non-adjacent scale items ('Distant Entailing Disjuncts', Fox and Spector (2018); 'Non-convex disjunctions', Bergen, Levy and Goodman (2016)), the constraint loosens:

- (16) The rest of the cast ... sounds either super fantastic or okay.

³Hannah Barker, *Family and Business during the Industrial Revolution*, Oxford 2017 (www.oapen.org/download/?type=document&docid=1001049); Singh's example is:

- (iii) (John or Mary) or both came to the party
 (iv) #(John and Mary) or (John or Mary) came to the party

Indeed, *all or some* does occur (about $\frac{1}{8}$ as often as the other way around), and arguably non-adjacency is one reason.

3.2 Contrast focus and exhaustification under negation

Recall that *Exh* is ruled out directly under negation, as long as this is not in turn in a downward entailing context:

- (17) a. #The Kannada word *mara* does not mean 'tree' or 'wood'.
 It means both.

Unless the scalar item has narrow, contrastive focus:⁴

- b. The Kannada word *mara* does not mean 'tree' OR 'wood'.
 It means both.

This observation leads Fox and Spector (2018: 5) to this generalization:

(18) **The Implicature Focus Generalization**

Implicatures can be embedded under a downward entailing (DE) operator only if the (relevant) scalar term bears pitch accent.

For and Spector set out to show how this generalization can be made to follow from a refined version of their economy condition – the idea is that embedded implicatures are in principle possible in every context, but require a pitch accent on the relevant scalar item in DE contexts because

the narrow focus serves to restrict the set of alternatives *Alt* for *Exh* as a focus sensitive operator.

This seems a good idea, but the details are complicated.

Interestingly, even positive polarity items are licensed in such contexts:

- (19) we won't be together SOME of the time, we'll be together CONSTANTly!

As it appears, a PPI can be 'shielded' by *Exh* (Szabolcsi 2004).

⁴Actually, the contrast could be less clear here than in the Fox and Spector example:

- (i) #John didn't do the reading or the homework. He did both.
 (ii) John didnt do the reading OR the homework. He did both.

3.3 Challenges to key evidence

Potts (2013) argues that the empirical foundation for Hurford’s constraint is not firm. He has collected 161 counterexamples here: <http://goo.gl/VAGqnB>. Let me add a particular class: scalar items modified by *at least*.

- (20) For example, all new cars launched by Volvo from 2019 will be at least partially or completely battery-powered, . . .

Potts concludes, in fact, that HC does not exist and hence cannot furnish an argument for embedded implicatures.

Russell (2006) offers counterarguments to data like (1)–(3) being evidence for a grammatical theory. See also Simons (2010).

One other source of concern is data like the following:

- (21) This is what everybody wants, but #(only) some people manage to do.
- (22) I think the ‘Golden Ratio’ is something that you always strive for but #(only) hit some of the time.

The fact that *only* is necessary in these contexts is a bit mysterious if *Exh* applies freely and has the effect of adding ‘only’. Is the addition not-at-issue?

3.4 Outlook

Recent work in Game theoretic pragmatics – e.g., Potts, Lassiter, Levy and Frank (2016) – aims at accounting for embedded exhaustification without an embedded exhaustifier, in a not solely grammatical theory that incorporates neo-Gricean hypotheses about lexical alternatives. This work

thus contributes to a synthesis of grammatical and probabilistic views on pragmatic inference.

→ Next installment!

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