

Cornell University
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Economy and Embedded Exhaustification Danny Fox and Benjamin Spector

Background: Putative cracks in the Neo-Gricean Framework (mostly reviewed in Cheirchia, Fox and Spector, in press; henceforth, CFS)

1. **Obligatory implicatures** (Cheirchia, Magri)
2. **NPI licensing:** Intervention effects in NPI licensing (Cheirchia, Gajewski, Homer)
3. **Modularity:** Evidence that implicatures are computed by a modular system encapsulated from various propositions we know to be true (Fox, Fox and Hackl, Magri, Singh)
4. **Cummulativity:** Implicatures of sentences in which numerals receive cumulative interpretations (Landman)
5. **Free Choice Phenomena** (Chemla, Fox, Klinedinst)
6. **Embedded Implicatures** (Chierchia, Cohen, Landman, Levinson, passim)

Question: Are there embedded implicatures?

As we will see: there is conflicting evidence.

Proposal:

- A. **There are embedded implicatures.** implicatures are derived by an operator *exh*, which, in principle, can be applied in any scope position (CFS, Fox, Landman, Sevi, and others). Hence, there have to be embedded implicatures.

Given this account, we will use a more transparent term, namely *Embedded Exhaustification*, **EE**.

- B. **Economy:** EE is not always visible due to the effects of an economy condition which restricts application of *exh*.

Problem #1: The Relevance of Focus

Evidence in favor of embedded implicatures:

- (1) John didn't do the reading OR the homework. He did both.

Evidence against embedded implicatures:

- (2) #John didn't do the reading or the homework. He did both.

More specifically,

- a. If there are embedded implicatures, why is (2) bad
(a question raised most forcefully by Horn 1989)?
- b. If there are no embedded implicatures, why is (1) good?
(a question raised by many: Cohen, Kempson, Levinson, *passim*)

The Implicature Focus Generalizations: *implicatures* can be embedded under a downward entailing (DE) operator only if the (relevant) scalar terms bear pitch accent.¹

Problem #2: Gajewski and Sharvit's Problem:

- (3) a. John talked to Mary or Sue, or both.
- b. *John didn't talk to Mary or Sue, or both

We will see that the acceptability of (3)a requires EE. But then why is (3)b bad?

Problem #3: Singh's Problem:

- (4) a. John talked to Mary or Sue, or to both Mary and Sue.
- b. *John talked to both Mary and Sue or to Mary or Sue

Similarly, why is (4)b bad?

Structure:

1. Explain the nature of the arguments in CFS for EE based on sentences such as (3)=(4).
2. Present a simplified version of the Economy condition that deals with Singh's observations (problem #3) and makes additional predictions.
3. Extend the condition to disallow EE in DE contexts, thus accounting for G&S's problem (Problem #2), with an additional prediction.
4. Discuss certain assumptions about the nature of scalar alternatives and their relationship to focus that will allow us to further extend the proposal to a solution of Problem #1.

1. HC and EE (background)

- (5) a. #John was born in France or Paris.
- b. #I have a dog or a German Shepard.

¹ The following alternative Generalization is sometimes presupposed, but argued against in CFS:
An alternative (false) Implicature Focus Generalizations: *implicatures* can be embedded only if the (relevant) scalar terms bear pitch accent.

- (6) **Hurford's constraint (HC):** a disjunction *p or q* is unacceptable when one of the disjuncts entails the other.²

But

- (7)a. John talked to [Mary or Sue] or both. (Hurford 1974)
 b. John did some or all of the homework.
 c. John read 3 books or more. (Gazdar 1979)

Our Claim:

- (8) **EE is the culprit:** The sentences in (7) must receive the parse in (7)', which does not violate HC.

- (7)' a. [Exh($p \vee q$)] \vee ($p \wedge q$)
 b. [Exh(Some)] \vee (ALL)
 c. [Exh(Three)] \vee (more than 3)

Where

- Exh($p \vee q$) \equiv ($p \vee q$) $\wedge \neg$ ($p \wedge q$)
 Exh(Some) \equiv Some $\wedge \neg$ ALL
 Exh(Three) \equiv Three $\wedge \neg$ More than three

If we are right, these are cases where implicatures are computed locally (i.e. cases of EE) without any pitch accent on the relevant scalar item.

Evidence that we are right: cases where the form of EE needed to obviate HC has global consequences for meaning and we argue that these consequences are correct (see CFS for details).

2. Basic Strategy for Singh and G&S

(9) Singh's Asymmetry

- a. John either talked to Mary or Sue or to both (Mary and Sue).
 b. *John either talked to both Mary and Sue or to Mary or Sue.
 (Singh 2007)

(10) Gajewski & Sharvit's restriction

- *John didn't talk to Mary or Sue or to both.
 (Gajewski and Sharvit 2007)

Basic Idea: *Exh* cannot appear in the position required for (9)b and (10) to obviate HC.

² See Singh 2008, for arguments that the constraint should be strengthened, arguments, which as Singh mentions, do not bear on our conclusions.

- (11) **Ruled out by Economy**
 a. (p and q) or Exh(p or q)
 b. \neg [Exh(p or q) or (p & q)]

- (12) **Ruled out by HC**
 a. (p and q) or (p or q)
 b. \neg [(p or q) or (p & q)]

3. An Economy Condition on *Exh* insertion (first version)

- (13) **Economy Condition:** *S(Exh(A)), if *Exh* is incrementally vacuous in S.
 (In a sense very close to that of Schlenker 2008)
- (14) a. An occurrence of *Exh* is *globally* vacuous in a sentence S if eliminating it doesn't change truth conditions, i.e., if S(Exh(A)) is equivalent to S(A)
- b. *Exh* which takes A as argument is *incrementally* vacuous in a sentence S if *Exh* is globally vacuous for every continuation of S at point A.
- c. S' is a continuation of S in point A if S' can be derived from S by replacement of constituents that follow A.
- d. Y follows A if all the terminals of Y are pronounced after all the terminals of A.

4. The Singh Asymmetry

- (15) The Hurford Case:
 a1. [Exh(p or q)] or (p and q) \sqrt Economy: *Exh* is not incrementally vacuous
 a2. *(p or q) or (p and q) *Hurford's constraint
- The Singh Case:
 b1. *(p and q) or exh[(p or q)] *Economy: *Exh* is incrementally vacuous
 b2. *(p and q)] or (p or q) *Hurford's constraint

4.1. On the reality of the effect (from Google)

- (16) a. "some or many" **206,000** vs. "many or some" **11,400**
 b. "many or all" **573,000** vs. "all or many" **112,000**

So there is a clear asymmetry in Singh's direction, but it doesn't seem to be absolute. We want to argue: the numbers are to be accounted for by an absolute constraint (Economy) which is obviated in certain environments.

In particular...

- (17) "some or all" **494,000** vs. "all or some" **457,000**

We hope to be able to make some sense of these numbers, once we examine some further predictions of our proposal

4.2. Further Predictions

The basic logic:

- Singh's asymmetry shows up because *exh* is globally vacuous in standard Hurford disjunctions.
- For this reason, there is an asymmetry between the first and the second disjunct: *exh* on the first disjunct is globally vacuous but not incrementally vacuous, whereas *exh* on the second disjunct is incrementally vacuous. (On a final constituent global and incremental vacuity are equivalent).
- But this is not a necessary property of entailing disjunct, as we will see.
- There are cases where one disjunct entails another yet exhaustifying one is not globally vacuous. In such cases, it will not be incrementally vacuous on either of the disjuncts (because global non-vacuity entails incremental non-vacuity). Singh's asymmetry should thus not hold.

We can thus construct cases where *Exh* is not incrementally vacuous even when it appears in a second disjunct and needed to obviate Hurford's constraint. We predict that such cases would be acceptable (in contrast to Singh, who designed a system where the asymmetry is a primitive).

4.2.1. Distant Entailing Disjunctions (DEDs)

(18) Ingredients:

Take two sentences *p* and *q*, such that:

- a. *q* entails *p*
- b. this entailment can be obviated by exhaustification: there is a way to strengthen *p* by *Exh*, *S(p)*, such that *p* doesn't entail *S(p)*
- c. *q or S(p)* is stronger than (*q or p*).

Strengthening of *p* by *exh* will be licensed by Economy (since it is not vacuous), *q or p* will receive the parse *q or S(p)*, which will not violate HC:

ALL or Some

- (19) Did John do most of the homework?
No. He did all of it or some of it.

Free Choice Effect in the second disjunct

- (20) a. *John (either) did both the reading and the homework or the reading or the homework.

- b. We are either required to do both the reading and the homework or we're required to do the reading or the homework.

Not (incrementally) vacuous because of the free choice effect:

$$\text{Exh } \Box(p \vee q) \Leftrightarrow \Box(p \vee q) \wedge \neg\Box p \wedge \neg\Box q \Rightarrow \Diamond q \wedge \Diamond p$$

Hence stronger than $\Box(p \vee q) \ \& \ \neg\Box(p \wedge q)$

(See: Fox, Sauerland, Spector, among others)

Exh in an embedded position within the second disjunct

- (21) Either every student solved all of the problems, or every student solved most of the problems

Predicted to be fine, but only under the (a) parse for the second disjunct, in which *exh* is embedded under \forall :

- a. "...or every student solved *exh*(most) of the problems"
 (entails uniformity among the students: either they all solved all of the problems, or none of them did)
 Under this parse, *Exh* is not globally weakening, since it leads to the exclusion of situations in which some students solved all of the problems while others solved most but not all.
- b. * ... or *exh*(every student solved most of the problems)
Exh is globally vacuous, hence locally vacuous because it occurs on the second disjunct

By contrast, reversing the disjunct should not necessarily carry the same entailment (since incremental non-vacuity is ensured on the first disjunct):

- (22) Either every student solved most of the problems, or every student solved all of them

In this case, the following parse should be ok:

exh(every student solved most of the problems) or every student solved all of them

This is so because *exh* is not incrementally vacuous (though it is globally vacuous)

In other words, we predict (22), in contrast to (21), to be ambiguous.

4.2.2. Embedding under Matrix *exh*

Making use of Free Choice

(23) We are required to do all or some of the homework

This is predicted to be good under the parse: $Exh(\Box(all) \text{ or } Exh(some))$

Under this parse, none of the instances of *exh* are globally vacuous. (Eliminate any instance of *exh* and you lose the Free Choice entailment $\neg\Box[Exh(some)]$.)

Similar Fact with Universal Quantifiers:

(24) a. *The student solved all or most of the problems.
 b. Each student solved all or most of the problems
 $Exh(\forall x (ALL\dots x\dots))$ or $Exh(Most\dots x\dots)$

Possibly relevant examples from Google:

(25) A new Harris Poll finds a plurality of Americans want **all or most** abortions to be illegal

(26) What are **all or some** of the differences and similarities between Roman Architecture and Egyptian Architecture?
 Similar to: *Tell me **all or some** of the differences and similarities between Roman Architecture and Egyptian Architecture*

5. Gajewski and Sharvit and version 2 of the Economy Condition

(27) $\neg[Exh(p \text{ or } q) \text{ or both}]$

Problem: *Exh* is not (incrementally) vacuous, although it is globally vacuous.

Proposal: *exh* cannot be incrementally weakening (a sentence with *exh* cannot be entailed (incrementally) by a sentence without *exh*).

Possible precedents: various strongest meaning hypotheses (work on reciprocals and plurality Dalrymple et. al., Winter, etc., Chierchia on implicatures)

Possible Functional Motivation (Fox 2007): The role of *exh* is to eliminate unwanted ignorance inferences derived by Gricean reasoning. If *exh* is weakening, it cannot eliminate ignorance inferences.

(28) **Economy Condition:** *S($Exh(A)$), if *Exh* is incrementally weakening in S.

(29) a. An occurrence of *Exh* is *globally* weakening in a sentence S if eliminating it strengthens truth conditions, i.e., if S(A) entails S($Exh(A)$).

(*special case when S is equivalent to S(Exh(A)); i.e. when *exh* is vacuous*)

- b. *Exh* which takes A as argument is incrementally weakening in a sentence S if *Exh* is globally weakening for every continuation of S at point A.

c-d as before

This modification does not affect the results of the previous section, since in that section all of the cases of non-vacuity involved strengthening (hence, of course, non-weakening)..

Further Prediction: We can construct cases where *Exh* is not incrementally weakening even when it appears in the scope of a DE operator.

- (30) a. *John didn't hand in the first or second assignment or both.
 b. Everyone who didn't hand in the first or second assignment or both failed the class.
- (31) a. *I would go to the movies without John or Bill or both.
 b. I wouldn't go to the movies without John or Bill or both.

But we will have additional predictions...

6. Towards a solution of Problem #1: deriving The Implicature Focus Generalizations, basic ingredients

Our solution to Problem #1 will contain two independent ingredients:

- a. An observation that embedding *exh* below a DE operator need not be weakening if there is another *exh* above the DE operator, as in: ***Exh(-Exh(p or q))***
- b. A generalized version of the economy condition which compares possible domain restrictions for *exh* (and is needed on independent grounds).

As such, the generalized condition can rule out certain patterns of focus marking, because focus marking, we will claim, is directly correlated with choice of alternatives.

We will start with (b)

7. Economy as a condition on the domain of *exh*

7.1. Santorio's problem

Santorio (2008) presents the following challenge to our account of Singh's asymmetry.

- (32) a. Some or many of the students were in the room.
 b. ?? Many or some of the students were in the room.

Why isn't (32)b good under the parse in (32)'?

- (32)' Exh(Many) or Exh(Some)
 Many and not all
 or Some but not many

After all:

- a. Both occurrences of *exh* are globally strengthening (hence, of course, incrementally strengthening). [If either occurrence of *exh* were dropped, the sentence would be true if all the students were in the room.]
 b. (32)' does not violate HC. [The two disjuncts are incompatible.]

7.2. Comparison Class for Economy – The basic intuition

Our Economy condition looks at a constituent *exh*(φ) in a given syntactic context and checks how it fares relative to its competitor φ . (It shouldn't yield a weaker meaning)

We would like to maintain our proposal but to add additional competitors. Santorio's case is problematic because *Exh[Some]*, (= *some but not many*) does yield a stronger meaning than what we get from its competitor without *exh*, as we've seen. However, it does not yield a stronger meaning from what we get from another potential competitor, *some but not all*.

- (33) **Previous Competition:** *exh_{many}*(some) [= *some but not many*] competes with *some*
New Competition: *some but not many* competes not only with *some* but also with *some but not all*
- (34) a. **Previous Intuition:** exhaustification is vacuous if it doesn't yield something stronger than what we would get *without* exhaustification.
 b. **New Intuition:** exhaustification is vacuous if it doesn't yield something stronger than what we would get with *less* exhaustification.

The proposal up to now was that *exh_{many}*(some) is blocked if the weaker competitor *some* yields a result which is globally just as strong. In such a case we said that *exh* is weakening relative to this competitor.

Now we will say that that $exh_{many}(\text{some})$ is blocked if one of the weaker competitors $exh_{all}(\text{some})$ or *some* yields a result which is globally just as strong. In such a case we can say that exh is weakening relative to one of these competitors.

In other words, in Santorio's example the exhausted meaning of the second disjunct needed to obviate HC, *some but not many*, is blocked by the weaker competitor: *some but not all*. If the second disjunct were to receive the meaning of this weaker competitor (*some but not all*) the meaning of the matrix sentence would be the same.

7.3. The Actual Proposal

Let C be a set of sentences. And let $Exh_C(X)$ be the exhausted LF of X where C is the domain restrictor for Exh .

(35) Meaning $Exh_C(X)$ is true iff X is true and all members of C not entailed by X are false.³

(36) Comparison-Class ($Exh_C(X)$) = $\{Exh_{C'}(X): C' \subset C\}$

A sentence equivalent to S is always in the Comparison-Class: $S \Leftrightarrow Exh_{\emptyset}(S)$

If C' is a proper subset of C , $Exh_{C'}(X)$ will entail $Exh_C(X)$

The Economy condition will not allow the use of the stronger sentence $Exh_C(S)$ if it leads to (incremental) weakening relative to $Exh_{C'}(X)$.

(37) **Economy Condition:** $*S(Exh_C(A))$, if Exh_C is incrementally weakening in S .

(38) a. An occurrence of Exh_C is globally weakening in a sentence S if choosing a proper subset of C strengthens truth conditions, i.e., if there is a proper subset of C , C' , such that $S(Exh_{C'}(A))$ entails $S(Exh_C(A))$

b-d as before

Easy to see that if Exh_C is (incrementally) weakening by (13), then it is also (incrementally) weakening by (38). [Just let the empty set be C' .]

³ There are various reasons to modify (35), which, we think, can be made consistent with the eventual proposal. What is needed is to define the comparison class as follows:

(i) Comparison-Class ($Exh_C(X)$) = $\{Exh_{C'}(X): I-E(C',p) \subset I-E(C,p)\}$
See Fox 2007.

7.4. Solving Santorio's problem

- (32)" a. *Exh_{all}(Many) or Exh_{many, all}(Some) Economy
 b. *Exh_{all}(Many) or Exh_{all}(Some) Hurford's Constraint

7.5. Complication

- (32)" Exh_{all}(Many) or Exh_{many}(Some)

Claim: This is plausibly ruled out by an independently needed condition on domain restriction. The domain restriction, C, must be a contextually salient sub-set of the formally defined alternatives (which we will specify shortly). The fact that *all* is a member of the set for the first instance of *exh* tells us that it is contextually salient. Hence it should be a member of the alternatives for the second *exh*.

8. *Exh* in DE contexts

How can *exh* in a DE context satisfy Economy?

- (39) a. John didn't talk to Mary OR Sue. He talked to both.
 b. Every boy who did the reading OR the homework got an A.
 Every boy who did both got an A+.

8.1. Answer a-la Horn

Exh cannot be inserted in a DE context!

Things appear otherwise because of various meta-linguistic strategies that are associated with pitch accent.

This will be a boring answer to Problem#1 consistent with our proposal for Problem#2 and Problem#3.

But we think we should try to do better. In particular, what are these meta-linguistic strategies? Originally, Horn suggested meta-linguistic negation, but examples such as (39)b should convince us that there is a more general operator. But, then we're back to the original dilemma. Why can the operator be freely inserted in various embedded positions (as we learn from Huford's constraint), and why is its insertion in DE contexts associated with specific focus marking?

8.2. Sketch of our proposal

8.2.1 The presence of a higher *exh*

Exh can be inserted in a DE context, only if there is another *exh* outside the DE context.

$$(40) \quad \text{Exh}_{C1} [\neg[\text{Exh}_{C2}(p \text{ or } q)]]$$

An example that is licensed by the Economy condition:

$$C1 = \{\neg(p \text{ or } q)\}$$

$$C2 = \{(p \text{ and } q)\}$$

$$(41) \quad \text{Exh}_{\{\neg(p \text{ or } q)\}} (\neg[\text{Exh}_{\{p \text{ and } q\}}(p \text{ or } q)]) = \\ \neg[\text{Exh}_{\{p \text{ and } q\}}(p \text{ or } q)] \ \& \ \neg\neg(p \text{ or } q) = \\ p \text{ or } q \text{ and } \neg[(p \text{ excl-or } q)], \text{ i.e., } p \text{ and } q.$$

Evidence that $\text{Exh} [\neg[\text{Exh}(p \text{ or } q)]] = p \ \& \ q$

- (42) Each of our students studies both of these fields or none of them.
- a. John is no exception. He doesn't study phonology OR morphology: he studies both.
 - b. (#)John is no exception. He doesn't study phonology OR morphology: he either studies both or none.
- (43) None of our students studies phonology OR morphology.
Every one studies either both of these fields or none of them.
(to be understood shortly)

8.2.2. The connection with pitch accent

We will see that Exh_{C2} is incrementally weakening if C_2 has additional members besides *p and q*. So if *p and q* is a member of C_2 , it must be the only member.

But then an independently needed condition on focusing (namely Minimize Focus, Schwarzschild 1999) will require narrow focus on *or*, thus solving #1.

9. The proposal

9.1. The relevance of pitch accent

Pitch accent enters into the determination of alternatives.

If a scalar item is focused, we get the appropriate alternatives for exhaustification:

- (44) $\text{Exh}_{\text{ALT}}[\text{CP John talked to Mary OR}_F \text{ Sue}]$
 ALT is determined by the focus value of the prejacent CP, which includes
John talked to Mary and Sue.

So why is pitch accent not required on *or*?

Answer: there can also be broader focus with the default pronunciation, e.g.:

- (45) $\text{Exh}_{\text{ALT}}[\text{CP John talked to [Mary or SUE]}_F]$
 ALT is determined by the focus value of the prejacent CP, which includes
John talked to Mary and Sue, as well as some other alternatives, for example:
John talked to Dick.

If we have broad focus, there will be at least one alternative which is not generated by narrow focus. This is fairly standard for the theory of focus sensitivity, and we will assume that it follows from the combination of following two principles:

- (46) a. **Association with Focus (AF):** The set of alternatives for a focus sensitive operator must be a subset of the focus value of the prejacent.
 b. **Minimize Focus (MF):** A sentence can't have a focus value F, if it would satisfy AF with another focus value F' (derivable by a different distribution of focus marking), and $F' \subset F$.

Consequences:

- a. AF allows M&S to be a member of ALT in both (44) and (45).
 b. But if $\text{M\&S} \in \text{ALT}[(45)]$, there must, by MF, be at least one member of ALT distinct from M&S (let's say *D*), else the sentence would be licensed with the focus value of (44).
 c. Consequently, if (45) yields the “*not and*” inference, it must yield an additional exclusive inference that would make it stronger than (44), e.g. $\neg D$.
- (47) More Generally: Let S_{narrow} be a sentence that contains one scalar item with narrow focus on the scalar item, and let *not* S_1 be its SI. Let S_{broad} be identical to S_{narrow} with the sole exception that focus is on a constituent that properly dominates the scalar item.
- a. AF allows S_{broad} to have *not* S_1 as an SI.
 b. But then it must have an extra SI, call it *not* S_2

9.2. A key assumption (based on Katzir 2008, Fox and Katzir in press)

In the parse in (48), the relevant alternative for the matrix *exh* is the prejacent without exhaustification, i.e., *not (S)*

- (48) Exh [*not exh (S)*]
 Relevant alternative for Matrix *Exh*: not(S)

Generalized to all (DE) operators

- (49) Exh [*OP exh (S)*]
 Relevant alternative for Matrix *Exh*: OP(S)

9.3. Consequences for a non-DE context

- (50) Exh_C [John talked to [Mary or Sue]_F]

Phonology: pitch accent on *Sue*

Focus value:

{John talked to Mary or Sue, John talked to Mary, John talked to Sue, John talked to Mary and Sue, John talked to Fred...}

- (51) Exh_C [John talked to Mary or_F Sue]

Phonology: pitch accent on *or*

Focus value:

{John talked to Mary or Sue, John talked Mary and Sue}

C= any salient sub-set of the focus value that satisfies Minimize Focus.

So, by MF, one cannot select C = {John talked Mary and Sue} with pitch accent on Sue.

But both representations can yield the *exclusive or* inference, hence no expectation that narrow focus will be needed in upward monotone contexts.

9.4. Consequences for a DE context

9.4.1. Negation

- (52) $\text{Exh}_{\{\neg(p \text{ or } q)\}} (\neg[\text{Exh}_{\{p \text{ and } q\}} (p \text{ or}_F q)]_F) =$
 $\neg[\text{Exh}_{\{p \text{ and } q\}} (p \text{ or } q)] \ \& \ \neg\neg (p \text{ or } q) = p \ \& \ q$

Neither *exh* is (incrementally) weakening

- (53) a. *Exh_{¬(p or q)} (¬[Exh_{p and q} (p or q)_F]_F) violates minimize focus
 b. *Exh_{¬(p or q)} (¬[Exh_{p and q, d} (p or q)_F]_F) The lower *exh* is incrementally weakening

$$\begin{aligned} \text{Exh}_{\{\neg(p \text{ or } q)\}} (\neg[\text{Exh}_{\{p \text{ and } q, d\}} (p \text{ or } q)]) = \\ \neg[\text{Exh}_{\{p \text{ and } q, r\}} (p \text{ or } q)] \ \& \ \neg\neg (p \text{ or } q) = \end{aligned} \quad \begin{array}{l} p \text{ or } q \text{ and} \\ \text{either } (p \text{ and } q) \text{ or } r. \end{array}$$

9.4.2. Generalizing to other DE operators

(54) $\text{Exh}_{\{\text{OP}(p \text{ or } q)\}} (\text{OP}[\text{Exh}_{\{p \text{ and } q\}} (p \text{ or }_F q)]_F) =$
 $\text{OP}[\text{Exh}_{\{p \text{ and } q\}} (p \text{ or } q)] \ \& \ \neg\text{OP} (p \text{ or } q)$

Neither *exh* is weakening.

Explanation: For each *exh* showing that it is not weakening involves comparison with the representation without *exh* (the empty set as restrictor). The proof is trivial

It's also easy to see that if the lower *exh* would have the extra-alternative needed for broad-focus the result would be weaker.

10. A new theory of alternatives

Based on Fox and Katzir (in press). Some other time...

11. Back to Gajewski and Sharvit

(55) $\text{Exh}_{\{\neg(p \text{ or } q)\}} [\neg[\text{Exh}_{\{p \text{ and } q\}} (p \text{ or } q) \text{ or both}]]$

Here Matrix *exh* is (incrementally) weakening. (Note: embedded *exh* is globally weakening but not incrementally weakening.)

Two DED disjuncts.

- (56) We did not invite the first year students or all of the students. We invited the first year students and the second year students.

If [S (P) or Q] is stronger than [P or Q], then ¬(P or Q) is stronger than ¬[S (P) or Q].

We thus get:

(57) $\text{Exh}_{\{\neg(P \text{ or } Q)\}} [\neg[S (P) \text{ or } Q]] = \neg[S (P) \text{ or } Q] \ \& \ [P \text{ or } Q]$

- (58) We did not introduce every boy to Mary or Sue or every boy to Mary and Sue. We introduced every boy to Mary.

- (59) We did not introduce every boy to Mary or Sue or every boy to Mary and Sue. We introduced some boys to Mary or Sue and some boys to Mary and Sue.

12. Summary:

Hurford Disjunctions provide important evidence for the existence of EE.

We thus need to understand why EE is restricted, in particular why it cannot occur in DE contexts without special pitch accent (problem 1).

The distribution of Hurford disjunctions is a good probe for studying an independently needed constraints on EE (problems 2 and 3). Our hope was that the solutions to these problem will resolve problem 1 as well.

Problems 2 and 3 motivated an economy condition that ruled-out incremental weakening. We tried to argue that a particular version of this condition which compared alternative domain restrictions extended to problem 1 as well.

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