

# The grammatical approach (Chierchia, Fox & Spector)

starting point

implicatures are context dependent but...

♥ constrained by at least two grammatical factors:

☞ lexicon (Horn scales)

☞ monotonicity constraints (scale directionality)

# Embedded implicatures: cracks in the Gricean picture

- ▶ from Gricean reasoning: epistemic step needs to be accounted for

(1) a. John or Bill will show up  
b. The speaker has no evidence that they both will show up

- ▶ if the speaker has an opinion on whether J or B will show up

(2) a. John or Bill and not both will show up  
b.  $O_{ALT}$ (John or Bill will show up)

- ▶ parallel with focus semantics/exhaustification:  $O$  = covert *only*

(3) A: So, did you see the students?  
B: I saw [F Joe and Sue]  
(where the constituent [F Joe and Sue] bears focal stress)

# Embedded implicatures: cracks in the Gricean picture

## ▶ scale reversal

(4) A: Who will come to the party?

B: I doubt that all of the students will

B-ALT: I doubt that (some of the) students will come to the party

+> I think that some will come.

☆ Gricean system works fine with two stipulations

☞ lexically defined alternatives (Horn scales)

☞ opinionated speaker (epistemic step)

† so why do we need exhaustification (covert *only*)?

# Embedded implicatures: cracks in the Gricean picture

- ▶ scalar implicatures embedded in:

*Downward Entailing context*

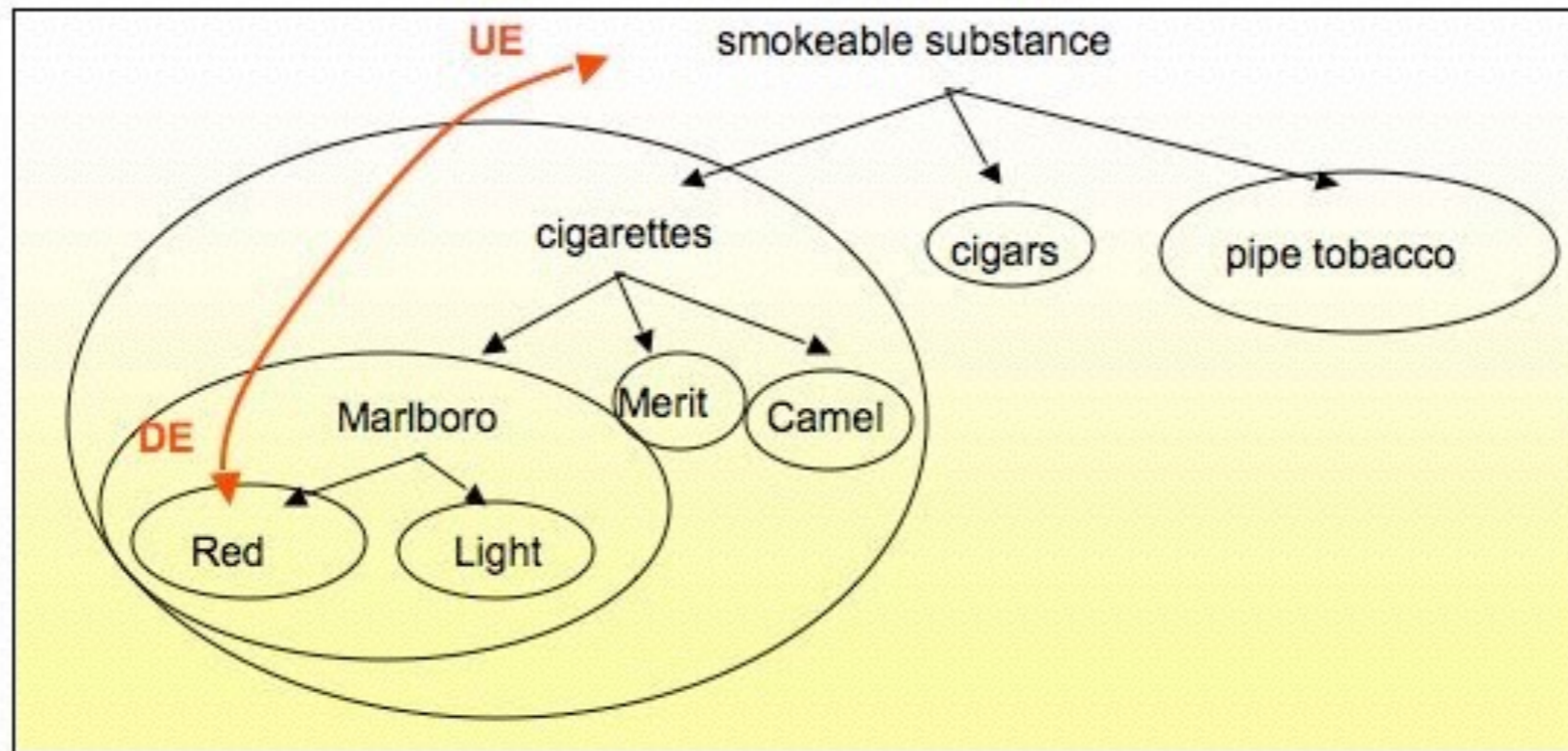
☞ leads to a logically weaker interpretation

*Non-monotonic contexts*

☞ leads to a logically independent interpretation

# DOWNWARD ENTAILMENT

## Upward Entailing & Downward Entailing



UE -----  
"I smoked a Marlboro"  
DE -----  
"I didn't smoke a cigarette"



UE -----  
"I smoked a cigarette"  
DE -----  
I didn't smoke a Marlboro

# Embedded implicatures: cracks in the Gricean picture

## ► DE-embedding (Levinson, 2000: intrusion)

- (5) a. If you take salad or dessert, you'll be real full  
b. If you take salad or dessert, you pay \$ 20; but if you take both there is a surcharge

- (6) a.  $O_{ALT}$ (if you take salad or dessert, you pay \$ 20)  
b. if  $O_{ALT}$ ( you take salad or dessert), you pay \$ 20

## ► complete (vacuous) derivation with Exhaustivity Operator (O)

- (7) a. If you take salad or dessert, you pay \$ 20  
b. If you take salad and dessert, you pay \$ 20  
c.  $O_{ALT}$ (if you take salad or dessert, you pay \$ 20) =  
if you take salad or dessert, you pay \$ 20  
 $\wedge \forall p p \in ALT$  [if you take salad or dessert, you pay \$ 20  $\not\subset p \rightarrow \neg p$  ] = if you take  
salad or dessert, you pay \$ 20

# Embedded implicatures: cracks in the Gricean picture

## ► DE-embedding (Levinson, 2000: intrusion)

- (5) a. If you take salad or dessert, you'll be real full  
b. If you take salad or dessert, you pay \$ 20; but if you take both there is a surcharge

- (6) a.  $O_{ALT}$ (if you take salad or dessert, you pay \$ 20)  
b. if  $O_{ALT}$ ( you take salad or dessert), you pay \$ 20

## ► complete (non-vacuous) derivation with Exhaustivity Operator (O)

- (7) a. take salad or dessert  
b. take salad and dessert  
c.  $O_{ALT}$ ( take salad or dessert)=  
take salad or dessert  
 $\wedge \forall p p \in ALT [take\ salad\ or\ dessert \not\subset p \rightarrow \neg p ] = take\ salad\ or\ dessert\ but\ not\ both$

## Embedded implicatures: cracks in the Gricean picture

### ► more examples with deeper embedding

- (8) a. John is firmly convinced that if O[most of his students do well], he is going to be happy and that if all of them will do well, he'll be even happier.
- b. Every candidate thought that presenting together his unpublished papers and his students evaluation was preferable to presenting the O[one or the other].



# Embedded implicatures: cracks in the Gricean picture

## ► non-monotonic contexts

*leaves open the possibility of the implicature*




(9) Exactly two students wrote a paper or ran an experiment.

*forces the implicature*

(10) Exactly two students wrote a paper or ran an experiment. The others either did both or neither.

# Embedded implicatures: cracks in the Gricean picture

## ▶ Exhaustivity operator (covert *only*)

-  can be embedded at any level of the derivation
-  can be embedded in DE or non-monotonic contexts
-  gives rise to a range of predicted readings that can be empirically tested

## Embedded implicatures: cracks in the Gricean picture

- ▶ NB: focal stress helps the relevant scalar interpretation

BUT: it's not necessary!

- ▶ no claims about their frequency..

- ☆ but they are natural and they are inconsistent with a post-compositional/globalist Gricean derivation

*post-compositional: maxims require reasoning on the whole proposition*

## A new argument for embedded implicatures: the Hurford's constraint

- ▶ it's hard to prove the existence of embedded implicatures in upward entailing contexts

*be R1 and R2 two different readings due to the embedding of the Scalar Implicature: if some reading R1 entails R2 there can be no situation in which R1 is true and R2 is false*

- ▶ need of a situation in which only one reading is allowed:  
Hurford's constraint comes into help!

Hurford's constraint (HC): A sentence that contains a disjunctive phrase of the form S or S' is infelicitous if S entails S' or S' entails S.

- (11) a. # Mary saw a dog or an animal.  
b. # Mary saw an animal or a dog.  
c. # Every girl who saw an animal or a dog talked to Jack.

# A new argument for embedded implicatures: the Hurtford's constraint

## ► counterexamples to HC

(11) Mary solved the first problem or the second problem or both problems  
(Hurtford)

$A \& B$  entails  $A$  or  $B$

(12) Mary read some or all of the books  
(Gazdar)

*all* entails *some*

Gazdar's generalization: A sentence containing a disjunctive phrase  $S$  or  $S'$  is infelicitous if  $S$  entails  $S'$  or if  $S'$  entails  $S$ , unless  $S'$  contradicts the conjunction of  $S$  and the implicatures of  $S$ .

CFS' idea:  $[O_{ALT}(A \text{ or } B)]$  or  $[\text{both } A \text{ and } B]$

# A new argument for embedded implicatures: the Hurford's constraint

► why is it so?

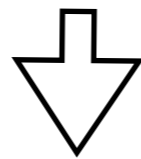
[O<sub>ALT</sub>(A or B)] or [both A and B]

A	B	O(A or B)	A and B
<i>t</i>	<i>t</i>	<i>f</i>	<i>t</i>
<i>t</i>	<i>f</i>	<i>t</i>	<i>f</i>
<i>f</i>	<i>t</i>	<i>t</i>	<i>f</i>
<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>

# A new argument for embedded implicatures: the Hurford's constraint

## ► HC rescue

(13) Peter either solved both the first and the second problem or all of the problems.



OALT(Peter solved the first problem and the second problem) or he solved all of the problems

=

- a. Peter only solved the first problem and the second problem, or he solved all of the problems
- b. Either Peter solved the first problem and the second problem and no other problem, or he solved all the problems

# Recursive exhaustification and new ‘global’ implicatures

## ► interaction with necessity modals

(14) We are required to either read Ulysses or Madame Bovary

+> We are not required to read both Ulysses and Madame Bovary

(15) We are required to either read Ulysses or Madame Bovary or both

+> We are not required to read both Ulysses and Madame Bovary

★ interestingly, these sentences have the same truth conditions and they generate the same implicature

★ do they generate other implicatures?



# Recursive exhaustification and new ‘global’ implicatures

(14) We are required to either read Ulysses or Madame Bovary

VS.

(15) We are required to either read Ulysses or Madame Bovary or both

(16) A: We are required to either read Ulysses or Madame Bovary                      ok!  
B: No! we have to read both

(17) A: We are required to either read Ulysses or Madame Bovary                      bad!  
B: ## No! We are not allowed to read both

(18) A: We are required to either read Ulysses or Madame Bovary or both                      ok!  
B: No! We are not allowed to read both



how is this possible at all?

given that they generate the same implicatures!

# Recursive exhaustification and new ‘global’ implicatures

(14) We are required to either read Ulysses or Madame Bovary

VS.

(15) We are required to either read Ulysses or Madame Bovary or both

(16) A: We are required to either read Ulysses or Madame Bovary                      ok!  
B: No! we have to read both

(17) A: We are required to either read Ulysses or Madame Bovary                      bad!  
B: ## No! We are not allowed to read both

(18) A: We are required to either read Ulysses or Madame Bovary or both                      ok!  
B: No! We are not allowed to read both

 **THEY DON'T GENERATE THE SAME IMPLICATURES!**

# Recursive exhaustification and new ‘global’ implicatures

- ▶ under the Grammatical Approach negation may target the exhausted constituent

(19) John didn't eat *some* of the cookies... he ate all of them!

(20) John didn't O[*eat some* of the cookies]... he ate all of them!

(16) A: We are required to either read Ulysses or Madame Bovary                      ok!  
B No! we have to read both

(21) A: We are required to read O[Ulysses or Madame Bovary]  
B No (we are not required to read only U or MB)! we have to read both

# Recursive exhaustification and new ‘global’ implicatures

We are required to either read Ulysses or Madame Bovary

VS.

We are required to either read Ulysses or Madame Bovary or both

- (16) A: We are required to either read Ulysses or Madame Bovary      ok!  
B: No! we have to read both
- (17) A: We are required to either read Ulysses or Madame Bovary      bad!  
B: ## No! We are not allowed to read both
- (18) A: We are required to either read Ulysses or Madame Bovary or both      ok!  
B: No! We are not allowed to read both

# Recursive exhaustification and new ‘global’ implicatures

A sentence of the form  $\square(A \text{ or } B)$  triggers the following implicatures:

$\neg \square A, \neg \square B$

(22) We are required to either read Ulysses or Madame Bovary

$\neg \square A$  = we are not required to read Ulysses = we are allowed not to read Ulysses

$\neg \square B$  = we are not required to read Madame Bovary = we are allowed not to read MB

We are required to either read Ulysses or Madame Bovary, we are allowed to read Ulysses without reading Madame Bovary, we are allowed to read Madame Bovary without reading Ulysses.

what we need: We are allowed to read both... but it is not implicated!!!

(17) A: We are required to either read Ulysses or Madame Bovary

bad!

B: ## No! We are not allowed to read both

# Recursive exhaustification and new ‘global’ implicatures

- (18) A: We are required to either read Ulysses or Madame Bovary or both      ok!  
B: No! We are not allowed to read both

what we need: We are allowed to read both

- (23) We are required to read Ulysses or Madame Bovary or both      remember:  $\square(A \text{ or } B)$   
 $\square [O_{ALT}(A \text{ or } B) \text{ or } (A \text{ and } B)]$        $+> \neg \square A, \neg \square B$

- (24)  $\neg \square (A \text{ and } B)$

We are not required to read both Ulysses and Madame Bovary  
= we are not required to read both novels = we are allowed to read just one

- (25)  $\neg \square (O_{ALT}(A \text{ or } B))$

We are not required to read Ulysses or Madame Bovary and not both  
= we are not required to read only one of them = **we are allowed to read both**

- (26) We are required to read Ulysses or Madame Bovary, we are not required to read only one of the two novels, we are not required to read both novels.

# Further problems with the Gricean picture

## ▶ optionality

(27) Who did some of the homework?

John did some of the homework. In fact, he did all of it.

*signals that the speaker is not  
opinionated (hence cancellation)*



## ▶ advantage for Gricean-based approach?

➤ Optionality captured by Grammatical Approach

➤ but not necessary: maybe the process of activating the alternative is optional, but not the insertion of the operator

# Further problems with the Gricean picture

- ▶ optionality totally predicted under Gricean view but...  
... this may turn into a disadvantage

(28) #John read (some) books; (in fact) he (might have) read exactly one book.

- (29) a. John didn't read books.  
b. I don't think that John read (some) books.

paraphrased into

- (30) a. John didn't read more than one book.  
b. I don't think that John read more than one book.



## Further problems with the Gricean picture

- ▶ optionality totally predicted under Gricean view but...  
... this may turn into a disadvantage
- ▶ plural morpheme may trigger an obligatory implicature that inserts *O* in some syntactic position c-commanding *pl*
- ▶ in DE contexts can be inserted in different positions and no implicatures may arise (see Spector's works)
- \* prediction: the at-least-two reading is obligatory in UE but not in DE

(31) Jack may have read one book; but I don't think he has read books.

## Further problems with the Gricean picture

### ▶ intervention effects

- (32) a. John didn't introduce Mary<sub>1</sub> to anyone she<sub>1</sub> knows  
b. \*John didn't introduce [every woman]<sub>1</sub> to anyone she<sub>1</sub> knows.

### ▶ the implicature may change the DE-ness of the sentence

☞ the NPI is not licensed anymore

# Further problems with the Gricean picture

► non-monotonic contexts again:

(33) Exactly one student solved some of the problems

is not entailed by

(34) Exactly one student solved all of the problems

► the final result:

- (35) a. Exactly one student solved some of the problems and it is false that exactly one student solved all of the problems  
b. One student  $x$  solved some of the problems,  $x$  did not solve all of the problems, and none of the other students solved any of the problems.

# Constraints on the Exh operator

optimize informativeness (somehow...)

the strongest:

- (36) Let  $\phi$  be a certain logical form. Let  $\phi$ 's competitors be all the LFs that differ from  $\phi$  only with respect to where exhaustivity operators occur. Then, everything else being equal,  $\phi$  is dispreferred if one of its competitors is stronger than  $\phi$ .

get local:

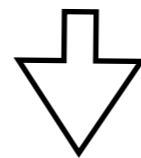
- (37) Let  $S$  be a sentence of the form  $[S \dots O(X) \dots]$ . Let  $S'$  be the sentence of the form  $[S' \dots X \dots]$ , i.e. the one that is derived from  $S$  by replacing  $O(X)$  by  $X$ , i.e. by eliminating this particular occurrence of  $O$ . Then, everything else being equal,  $S'$  is preferred to  $S$  if  $S'$  is logically stronger than  $S$ .

# Constraints on the Exh operator

optimize informativeness (somehow...)

*possible embeddings of Exhaustivity Operator at different scope sites*

- (38)
- a. Exactly one student solved some of the problems <no exhaustivity operator>
  - b.  $O(\text{Exactly one student solved some of the problems})$
  - c. Exactly one student  $O(\text{solved some of the problems})$



- (35)
- a. Exactly one student solved some of the problems, and it is false that exactly one student solved some of the problems
  - b. There is only one student who solved any of the problems, and that student didn't solve all of the problems