

The grammatical approach to scalar implicatures (SI) posits a covert operator *exh* whose semantic contribution is similar to that of *only* (Fox 2007, Chierchia et al. 2012, a.o.).

- ▶ Certain “triggers” of SI in English – disjunction, unstressed *some*, and bare numerals – require an associated *exh* to be as low as possible above the trigger.
- However, this requirement is lexicalized, and other triggers such as stressed *SOME* allow for more delayed exhaustification.

## Consequence

- Overt sentential focus operators in some languages must adjoin as low as possible while taking their focus in their scope.<sup>1</sup>
- ▶ *Exh* thus shares *syntactic* characteristics with some overt focus particles.

<sup>1</sup>See work on German (Jacobs 1983, Büring & Hartmann 2001; but see also Reis 2005, Smeets & Wagner 2018), Vietnamese (Erlewine 2017), Mandarin (Erlewine 2015, to appear), and English (Francis 2019: 57).

## Roadmap

- We identify the position of *exh* for SI triggers **using additive *also***, building on Spector & Sudo 2017 and Marty & Romoli 2021.

### *Exh and also*

- We study variation in SI triggers. **Syntactic features** ensure the proper placement of *exh*.

### Variation

- We explain interactions between **SI and *again***.

### *Exh and again*

- We derive the correct placement options for *exh* in cases of “**presupposed ignorance**.”



### Ignorance

- ▶ Ignorance inferences may be generated in embedded positions, contra Meyer (2013)’s “Matrix K” theory.

Additives such as *also* and *too* require a salient focus alternative to be true (Kripke 1990/2009, Heim 1992).

- (1) Mira teaches Arabic and Basque.  
# [Nina]<sub>F</sub> also teaches Arabic or Basque.

LF:  $\overset{exh}{\hat{\wedge}} [\text{TP } [\text{Nina}]_F \text{ also } \overset{exh}{\hat{\wedge}} [\text{vP } [\text{Nina}]_F \text{ teaches A. or B.}] ]$

- i.  $exh [also [A_{Nina} \vee B_{Nina}]]$  (following Spector & Sudo)  
 $= also [A_{Nina} \vee B_{Nina}] \wedge \neg also [A_{Nina} \wedge B_{Nina}]$   
 $\overset{ALSO}{\rightsquigarrow} (A_x \vee B_x) \wedge (A_x \wedge B_x) \text{ for some } x$  
- ii.  $also [exh [A_{Nina} \vee B_{Nina}]]$   
 $\overset{ALSO}{\rightsquigarrow} exh(A_x \vee B_x) = (A_x \vee B_x) \wedge \neg(A_x \wedge B_x)$  

Parse (i) predicts (1) to be felicitous, but it is not; S&S acknowledge (p. 512) they cannot rule out this parse.

- Does *exh* always adjoin to vP?

However, (2) is felicitous! *Exh* in (2) must be able to adjoin high, taking its trigger (the subject) in its scope, and therefore scopes over *also*.

- (2) Arabic and Basque are taught by Mira.  
Arabic or Basque is also taught by [Nina]<sub>F</sub>.

### An analysis in two parts:

- ① High *exh* placement is possible in (2) but must be blocked in (1). Disjunction obeys (3):
- (3) *Exh* must adjoin to the lowest propositional node while taking its trigger in its scope.
- ② Additives take scope in their pronounced position (e.g. Rullmann 2003) and can associate with a focus that has moved out (Erlewine 2014). (Here illustrated as reconstructed.)

### Support for ②:

*Exh* adjoins to the same position in (4a,b): the lowest propositional node above disjunction. *Exh* is then in the scope of *also* in (4a) but above it in (4b):

- (4) The accomplice seems to the judge and the jury to be remorseful.
- a. # [The murderer]<sub>F</sub> **also**  $\overset{exh}{\wedge}$  seems to [the judge or the jury] to be remorseful.
- b. ✓ [The murderer]<sub>F</sub>  $\overset{exh}{\wedge}$  seems to [the judge or the jury] to **also** be remorseful.

Unstressed *some* (*sm*) and bare numerals exhibit the same behavior as disjunction:

- (5) a. Evy met all of the students.  
# [Fran]<sub>F</sub> also met sm of the students.  
b. All of the students met Evy.  
✓ Sm of the students also met [Fran]<sub>F</sub>.
- (6) a. Gary borrowed five books.  
# [Hlee]<sub>F</sub> also borrowed four books.  
b. Five books were borrowed by Gary.  
✓ Four books were also borrowed by [Hlee]<sub>F</sub>.

Like disjunction, *sm*, and bare numerals require *exh* to adjoin as low as possible (3).

- But not all triggers require *exh* as low as possible!

*Exh* for **stressed *SOME*** and **superlative modified numerals** (SMNs) can scope above *also* in (7–8):

- (7) Evy met all of the students. (cf 5a)  
✓ [Fran]<sub>F</sub> also met SOME of the students.
- (8) Gary borrowed five books. (cf 6a)  
✓ [Hlee]<sub>F</sub> also borrowed at least four books.

But *exh* cannot be unboundedly far from *SOME*:

- (9) Evy expects [that she'll see all of the st's].  
# [F]<sub>F</sub> also expects [that she'll see SOME of them].
- (10) Evy expects [to meet all of the st's].  
% [Fran]<sub>F</sub> also expects [to meet SOME of them].

**Proposal:** SI triggers may bear **syntactic features** that ensure *exh* placement (cf Chierchia 2013):

- Disjunction, *sm*, and bare numerals bear a “**strong**” [**uexh**\*] feature; *exh* must adjoin as soon as possible to check [uexh\*].
- Stressed *SOME* and SMNs bear a “**weak**” [**uexh**] feature, which must be checked within its minimal finite clause or just above its embedding verb.

**Scalar adjectives** do not bear either syntactic feature, allowing *exh* to adjoin at the matrix level:

- (11) Ari expects that it will be freezing in Boston.  
✓ [Brie]<sub>F</sub> also expects that it will be cold there.

*Again* presupposes an event description (or property; Beck & Johnson 2004) to hold at a prior time.


- Our account accurately predicts the position of *exh* within or above the scope of *again*.

**Unstressed *sm* and bare numerals** require *exh* as low as possible.  $\Rightarrow$  *again* > *exh*

(12) *Context: Every year, Mary teaches a different group of students.*


Last year, Mary failed all of her students.

# Now, she [<sup>*exh*</sup> failed sm of her students ] again].

<sup>AGAIN</sup>  
 $\rightsquigarrow$  she failed some but not all before. 

(13) Yesterday, Gary borrowed five books.


# Today, he [<sup>*exh*</sup> borrowed four books] again].

<sup>AGAIN</sup>  
 $\rightsquigarrow$  he borrowed four but not five before. 

**Stressed *SOME* and superlative modified numerals** allow for delayed *exh*.  $\Rightarrow$  *exh* > *again*


(14) Last year, Mary failed all of her students.

✓ ...she [<sup>*exh*</sup> [failed SOME of her students again]].

<sup>AGAIN</sup>  
 $\rightsquigarrow$  she failed some of her students before. 

(15) Yesterday, Gary borrowed five books.

✓ ...he [<sup>*exh*</sup> [borrowed at least four books again]].

<sup>AGAIN</sup>  
 $\rightsquigarrow$  he borrowed at least four books before. 

For **disjunction**, we predict *exh* to be as low as possible  $\Rightarrow$  *again* > *exh*. We therefore predict (16) and (17) to be infelicitous. But there is some speaker variation.

(16) Yesterday, Masa ate an apple and an orange.  
 % Today, he ate an apple or an orange again.

(17) *Context: We're building a new room. We bought a door and a window which were both built open, installed them, and closed them both. Now it's getting hot.*  
 % I'll open the door or the window again.  
 cf. ✓ I'll open the window again. (restitutive)

- We tentatively propose that this reflects a difference in the availability of including *again* in Conjunction Reduction (possibly a form of gapping; see e.g. Hirsch 2017).

(16') He [ate an apple ~~again~~] or  
 [ate an orange again].

(17') I'll [open the door ~~again~~] or  
 [~~open~~ the window again].

Disjunction introduces **ignorance inferences**, argued to be due to another *exh* with a necessity modal  $\Box$  (Chierchia 2013, Meyer 2013), as in (18).

► Now consider the addition of *also* in (18).

(18) Mira speaks Arabic or Basque.

$$\begin{array}{c}
 exh \Box [ exh [A \vee B]] \\
 (A \vee B) \wedge \underbrace{\neg(A \wedge B)}_{\text{scalar implicature}} \wedge \underbrace{(\neg\Box A \wedge \neg\Box B)}_{\text{ignorance implicature}}
 \end{array}$$

The felicitous **disjunctive antecedent** (19a) requires parse (20a). Marty & Romoli (2021) observe that a “**split**” antecedent (19b) is also grammatical, requiring parse (20b). However, the **conjunctive antecedent** (19c) is not possible, showing that **parse (20c) is ungrammatical**, unexplained by M&R.

(19) a. Mira teaches Arabic or Basque.  
 ✓ [Nina]<sub>F</sub> also teaches Arabic or Basque.

b. Mira teaches Arabic and Ora teaches Basque.  
 ✓ [Nina]<sub>F</sub> also teaches Arabic or Basque.

c. Mira teaches Arabic and Basque.  
 # [Nina]<sub>F</sub> also teaches Arabic or Basque. (=1)

(20) a. **also** [ *exh*  $\Box$  [ *exh* [A<sub>Nina</sub>  $\vee$  B<sub>Nina</sub>]] ] ✓  
 $\overset{\text{ALSO}}{\rightsquigarrow} (A_x \vee B_x) \wedge \neg(A_x \wedge B_x) \wedge (\neg\Box A_x \wedge \neg\Box B_x)$

b. *exh*  $\Box$  [ **also** [ *exh* [A<sub>Nina</sub>  $\vee$  B<sub>Nina</sub>]] ] ✓  
 $\overset{\text{ALSO}}{\rightsquigarrow} (A_x \vee B_x) \wedge \neg(A_x \wedge B_x) \wedge (A_y \wedge \neg B_y) \wedge (\neg A_z \wedge B_z)$  ← unpacking *exh* above

c. *exh*  $\Box$  [ *exh* [ **also** [A<sub>Nina</sub>  $\vee$  B<sub>Nina</sub>]] ] ×  
 $\overset{\text{ALSO}}{\rightsquigarrow} (A_x \wedge B_x)$

► Our feature-checking proposal correctly requires at least one *exh* to adjoin as low as possible.

This allows for (20a,b) but not (20c).

Meyer (2013) proposes that  $K/\Box$  adjoins to the matrix clause root.

► The need for  $\Box$  below *also* in (20a) forms an argument against Meyer’s “Matrix K” theory, and instead supports Chierchia’s view where  $\Box$  may occur in embedded positions.

# References I

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