

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.¹
- ▶ *Exh* thus shares *syntactic* characteristics with some overt focus particles.

¹See 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]_F 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)
= $also [A_{Nina} \vee B_{Nina}] \wedge \neg also [A_{Nina} \wedge B_{Nina}]$
 $\overset{ALSO}{\rightsquigarrow} (A_x \vee B_x) \wedge (A_x \wedge B_x)$ 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]_F.

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]_F **also** $\overset{exh}{\wedge}$ seems to [the judge or the jury] to be remorseful.
- b. ✓ [The murderer]_F $\overset{exh}{\wedge}$ 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]_F also met sm of the students.
b. All of the students met Evy.
✓ Sm of the students also met [Fran]_F.
- (6) a. Gary borrowed five books.
[Hlee]_F also borrowed four books.
b. Five books were borrowed by Gary.
✓ Four books were also borrowed by [Hlee]_F.

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]_F also met SOME of the students.
- (8) Gary borrowed five books. (cf 6a)
✓ [Hlee]_F 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]_F also expects [that she'll see SOME of them].
- (10) Evy expects [to meet all of the st's].
% [Fran]_F 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]_F 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 [^{*exh*} failed sm of her students] again].

^{AGAIN}
 \rightsquigarrow she failed some but not all before. 

(13) Yesterday, Gary borrowed five books.

Today, he [^{*exh*} borrowed four books] again].

^{AGAIN}
 \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 [^{*exh*} [failed SOME of her students again]].

^{AGAIN}
 \rightsquigarrow she failed some of her students before. 

(15) Yesterday, Gary borrowed five books.

✓ ...he [^{*exh*} [borrowed at least four books again]].

^{AGAIN}
 \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]_F also teaches Arabic or Basque.

b. Mira teaches Arabic and Ora teaches Basque.
 ✓ [Nina]_F also teaches Arabic or Basque.

c. Mira teaches Arabic and Basque.
 # [Nina]_F also teaches Arabic or Basque. (=1)

(20) a. **also** [*exh* \Box [*exh* [A_{Nina} \vee B_{Nina}]]] ✓
 $\overset{\text{ALSO}}{\rightsquigarrow} (A_x \vee B_x) \wedge \neg(A_x \wedge B_x) \wedge (\neg\Box A_x \wedge \neg\Box B_x)$

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

c. *exh* \Box [*exh* [**also** [A_{Nina} \vee B_{Nina}]]] ×
 $\overset{\text{ALSO}}{\rightsquigarrow} (A_x \wedge B_x)$

► 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.

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