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Lecture 3: Exceptive-additive constructions

1. Intro

Exceptive and exceptive-additive constructions behave similarly when they occur with universal quantifiers.

(1) Every girl besides/but/except Mary came.
Domain subtraction: Every girl who is not Mary came.
Containment: Mary is a girl.
Negative inference: Mary did not come.

(2) No girl besides/but/except Mary came.
Domain subtraction: No girl who is not Mary came.
Containment: Mary is a girl.
Negative inference: Mary came.

The puzzle: Exceptive construction are known to be incompatible with non-universal quantifiers (Horn 1989).

Exceptive-additive constructions can occur in such contexts and they give rise to an additive inference.

(3) Some girl(s) besides/*but/*except Mary came.
Domain subtraction: Some girl who is not Mary came.
Containment: Mary is a girl.
Positive inference: Mary came.

(4) (Exactly) one girl besides/*but/*except Mary came.
Domain subtraction: (Exactly) one girl who is not Mary came.
Containment: Mary is a girl.
Positive inference: Mary came.

(5) At least/more than one girl besides/*but/*except Mary came.
Domain subtraction: At least/more than one girl who is not Mary came.
Containment: Mary is a girl.
Positive inference: Mary came.

(6) Fewer than/at most two girls besides Mary came.
Domain subtraction: Fewer than/at most two girls who are not Mary came.
Containment: Mary is a girl.
Positive inference: Mary came.

(7) **The Exceptive-additive generalization**: Exceptive- additive *besides* behaves similarly to exceptives in the contexts where exceptives are acceptable. In the contexts where exceptive constructions are ungrammatical, *besides* obtains the additive reading.

Logically there are two possibilities:

Possibility 1: the flip between the exceptive and the additive meaning is a true case of an ambiguity (Vostrikova 2019)

Possibility 2: there is no ambiguity here, like there is no ambiguity of exceptives with positive and negative universal quantifiers (Mayr & Vostrikova 2023)

2. The account

2.1 A universal quantifier

Let's assume that the semantic contribution of *besides* is identical to the semantic contribution of *but*.

(8) $[\![\text{besides}]\!]^{g,w} = \lambda x_e.\lambda f_{<et>}: f(x).\ \lambda y_e.\ f(y)\ \&\ \neg x \circ y$
$x \circ y$ iff $\exists z[z \leq x\ \&\ z \leq y]$

With these assumptions, the resulting restrictor is as shown below:

(9) $[\![\textit{girl besides Mary}]\!]^{g,w} = \lambda y_e.$ y is a girl$_w$ $\&\ \neg$y o Mary

Let's again assume that exceptive-additive inference is contributed by a separate element EXH.

(10) [$_{IP2}$ EXH$_{ALT}$ [$_{IP1}$ every [girl [besides$_F$ Mary]] came]]]

- The difference between the two types of constructions lies in the way the alternatives are constructed;
- Let's assume that the focus placement is different;
- Let's assume that the focus falls on *besides* itself.
- Let's assume that the only alternative for *besides* is *including*.

So, in the only alternative other than the prejacent nothing is subtracted

(11) Alt: { $\lambda w. \forall x[(x \text{ is a girl}_w \ \& \ \neg x \circ \text{Mary}) \rightarrow x \text{ came}_w]$;
$\lambda w. \forall x[x \text{ is a girl}_w \rightarrow x \text{ came}_w]$}

EXH asserts its prejacent IP_1 and negates the only alternative not entailed by it.

(12) $[\![IP_2]\!]^{g,w}$ = T iff $\forall x[(x \text{ is a girl}_w \ \& \ \neg x \circ \text{Mary}) \rightarrow x \text{ came}_w] \ \&$
$\neg\forall x[x \text{ is a girl}_w \rightarrow x \text{ came}_w]$

This is equivalent to:

(13) $\forall x[(x \text{ is a girl}_w \ \& \ \neg x \circ \text{Mary}) \rightarrow x \text{ came}_w] \ \&$
$\exists x[x \text{ is a girl}_w \ \& \ \neg \ x \text{ came}_w]$

A paraphrase:

Every girl who is not Mary came, but not every girl overall came.
This entails that Mary did not come, thus the negative inference is captured.

2.2 A negative quantifier

(14) [$_{IP2}$ EXH$_{ALT}$ [$_{IP1}$ no [girl [besides$_F$ Mary]] came]]]

So, in the only alternative other than the prejacent nothing is subtracted

(15) Alt: { $\lambda w. \neg\exists x[(x \text{ is a girl}_w \ \& \ \neg x \circ \text{Mary}) \ \& \ x \text{ came}_w]$;
$\lambda w. \neg\exists x[x \text{ is a girl}_w \ \& \ x \text{ came}_w]$}

EXH asserts its prejacent IP_1 and negates the only alternative.

(16) $[\![(14)]\!]^{g,w}$ = T iff $\neg\exists x[(x \text{ is a girl}_w \ \& \ \neg x \circ \text{Mary}) \ \& \ x \text{ came}_w] \ \&$
$\exists x[x \text{ is a girl}_w \ \& \ x \text{ came}_w]$

2.3 Exactly n numerals

This extends to *exactly n* numerals.

(17) [$_{IP2}$ EXH$_{ALT}$ [$_{IP1}$ [exactly one girl [besides$_F$ Mary]] came]]

(18) $[\![(17)]\!]^{g,w}$=1 iff $|\{x: x \text{ is a girl}_w \ \& \ \neg x \circ \text{Mary}\} \cap \{y: y \text{ came}_w\}| = 1 \ \&$
$|\{x: x \text{ is a girl}_w\} \cap \{y: y \text{ came}_w\}| \neq 1$

A paraphrase:
Exactly one girl who is not Mary came, but not exactly one girl came overall.
This is only possible if Mary came.

Conclusion:

- we capture the positive inference contributed by *besides* when it occurs with *exactly*
- we did not have to posit any ambiguity in the meaning of *besides*
- we can try to extend this approach to all other cases

2.4 A problem with upward monotonic quantifiers

An example of an upward monotonic quantifier:

(19) At least one girl from my class came ⇒
At least one girl came

(20) {z: z is a girl from my class }⊆{y: y is a girl}

An attempt to give a similar LF to the *at least n* does not lead to a well-formed meaning.

This is because the quantifier is upward entailing and both alternatives are entailed by the prejacent.

(21) [$_{IP2}$ EXH$_{ALT}$ [$_{IP1}$ [at least one girl [besides$_F$ Mary]] came]]

(22) Alt: {$\lambda w.\ \exists x[|x| = 1\ \&\ x$ is a girl$_w$ $\&\ \neg x \circ$ Mary $\&\ x$ came$_w$];
$\lambda w.\ \exists x[|x| = 1\ \&\ x$ is a girl$_w$ $\&\ x$ came$_w$]}

EXH has nothing to negate here.

This LF is ruled out by the non-vacuity constraint.

(23) NON-VACUITY: EXH[A] is infelicitous if EXH[A] is equivalent to A.

2.5 Deriving the right meaning for upward monotonic quantifiers

Our proposal is build on the idea that modified numerals are quantifiers over degrees and they undergo QR to be interpreted (Heim 2000, Hackl 2000, Mayr and Meyer 2014, Buccola and Spector 2016).

(24) [$_{IP2}$ at least one [$_{IP1}$ 1 [exactly d_1 girls came]]]

At least one undergoes QR and leaves a trace of type d.

There is a silent *exactly* within *at least n* left behind by QR.

(25) $[\![\text{exactly}]\!]^{g,w} = \lambda n_d.\lambda f_{<et>}.\lambda g_{<et>}.|\{x : f(x) = T\} \cap \{x : g(x) = T\}| = n$

(26) $[\![\text{at least}]\!]^{g,w} = \lambda n_d.\lambda f_{<dt>}.\ \exists d[d \geq n \ \&\ f(d) = T]$

(27) $[\![\text{at least one}]\!]^{g,w} = \lambda f_{<dt>}.\ \exists d[d \geq 1 \ \&\ f(d) = T]$

(28) $[\![\text{IP}_1]\!]^{g,w} = \lambda n.|\{x : x \text{ is a girl in } w\} \cap \{y: y \text{ came in } w\}| = n$

(29) $[\![(24)]\!]^{g,w} = T$ iff $\exists d[d \geq 1 \ \&\ |\{x: x \text{ is a girl in } w\} \cap \{y: y \text{ came in } w\}| = d]$

We propose that EXH is merged below the abstraction over degrees.

(30) [$_{IP3}$ at least one [$_{IP2}$ 1 [$_{IP1}$ EXH$_{ALT}$ [[exactly d_1 girl besides$_F$ Mary] came]]]]

(31) $[\![\text{IP}_1]\!]^{g,w} = T$ iff $|\{x: x \text{ is a girl in } w \ \&\ \neg x \circ \text{Mary}\} \cap \{y: y \text{ came in } w\}| = g(1)\ \&$
$|\{x: x \text{ is a girl in } w\} \cap \{y: y \text{ came in } w\}| \neq g(1)$

(32) $[\![(30)]\!]^{g,w} = T$ iff
$\exists d[d \geq 1 \ \&\ |\{x: x \text{ is a girl in } w \ \&\ \neg x \circ \text{Mary}\} \cap \{y: y \text{ came in } w\}| = d\ \&$
$|\{x: x \text{ is a girl in } w\} \cap \{y: y \text{ came in } w\}| \neq d]$

This straightforwardly extends to *more than one* numerals.

(33) More than one girl besides Mary came.

(34) $[\![\text{IP}_3]\!]^{g,w} = \exists d[d > 1 \ \&\ |\{x: x \text{ is a girl in } w \ \&\ \neg x \circ \text{Mary}\} \cap \{y: y \text{ came in } w\}| = d\ \&$
$|\{x: x \text{ is a girl in } w\} \cap \{y: y \text{ came in } w\}| \neq d]$

2.6 What about indefinites?

We can treat singular indefinites like *at least one* and plural indefinites like *more than one*.

(35) $[\![\text{some}]\!]^{g,w} = \lambda f_{<dt>}.\exists d[d \geq 1 \ \&\ f(d)=T]$
(36) $[\![\text{some'}]\!]^{g,w} = [\![\text{several}]\!]^{g,w} = \lambda f_{<dt>}.\ \exists d[d > 1 \ \&\ f(d)=T]$

2.6 Downward entailing numerals

The decompositional account outlined in the previous section can be readily extended to down- ward modified numerals like *fewer than n* and *at most n*.

In line with (Buccola and Spector, 2016), we adopt an approach that treats them as existential quantifiers over degrees.

This treatment parallels how we handle *at least n* and *more than n*.

(37) $[\![\text{fewer than}]\!]^{g,w} = \lambda f_{<dt>}.\lambda n_{d}.\lambda f_{<dt>}.\ \exists m[m<n\ \&\ f(m)=T]$

(38) $[\![\text{at most}]\!]^{g,w} = \lambda n_{d}.\lambda f_{<dt>}.\ \exists m[m\leq n\ \&\ f(m)=T]$

(39) $[\![\text{fewer than 2}]\!]^{g,w} = \lambda f_{<dt>}.\ \exists m[m<2\ \&\ f(m)=T]$

(40) $[\![\text{at most 2}]\!]^{g,w} = \lambda f_{<dt>}.\ \exists m[m\leq 2\ \&\ f(m)=T]$

This approach differs from the more conventional treatment of downward-entailing numerals, where they are considered negative degree quantifiers.

However, if constituent in the scope of the numeral is interpreted as *exactly*, the existential semantics yield the same truth conditions as those obtained by applying the lexical entries below (where they are treated as negative quantifiers) to a constituent lacking the *exactly* in its scope (Buccola and Spector, 2016).

(41) $[\![\text{fewer than 2}]\!]^{g,w} = \lambda f_{<dt>}.\ \neg\exists m[m\geq 2\ \&\ f(m)=T]$

(42) $[\![\text{at most 2}]\!]^{g,w} = \lambda f_{<dt>}.\ \neg\exists m[m>2\ \&\ f(m)=T]$

To illustrate this point using a specific example, let's examine (43) and the two formulations of its truth conditions in (44) and (45).

Both accurately predict the sentence to be true when 0, 1, or 2 girls came and false when 3 or came.

(43) At most two girls came.

(44) $\neg\exists d[d>2\ \&\ \exists x[|x|=d\ \&\ x \text{ is a girl}_{w}\ \&\ x \text{ came}_{w}]]$

(45) $\exists d[d\leq 2\ \&\ |\{x: x \text{ is a girl in } w\}\cap\{y: y \text{ came in } w\}|=d]$

3. The difference with exceptives

The relevant difference between exceptives and exceptive-additives is the way the alternatives are constructed.

For exceptives, we adopted Hirsch's (2016) proposal, where the alternatives are formed by substituting the DP following *but* by other DPs of at most equal complexity.

Again, let's assume that the girls are: Ann, Mary, Jane, Ivy.

(46) *Exactly one girl but Mary came.

(47) $[_{IP2}$ EXH$_{ALT}$ $[_{IP1}$ [exactly one girl [but Mary$_F$]] came]]

The prejacent of EXH means that exactly one of Ann, Jane, Ivy came.

(48) $[\![IP_1]\!]^{g,w}$ = T iff $|\{x: x \text{ is a girl in } w \ \& \ \neg x \circ \text{Mary}\} \cap \{y: y \text{ came in } w\}| = 1$

The set of alternatives is below.

We can negate maximally 2 of them without contradicting the prejacent.

(49) $\{\lambda w.\ |\{\text{Ann, Jane, Ivy}\} \cap \{y: y \text{ came in } w\}| = 1$ (the prejacent)
$\lambda w.\ |\{\text{Mary, Jane, Ivy}\} \cap \{y: y \text{ came in } w\}| = 1$
$\lambda w.\ |\{\text{Mary, Jane, Ann}\} \cap \{y: y \text{ came in } w\}| = 1$
$\lambda w.\ |\{\text{Mary, Ivy, Ann}\} \cap \{y: y \text{ came in } w\}| = 1\}$

This is ok: if Jane and Mary came

(50) $|\{\text{Ann, Jane, Ivy}\} \cap \{y: y \text{ came in } w\}| = 1$ &
$|\{\text{Mary, Jane, Ivy}\} \cap \{y: y \text{ came in } w\}| \neq 1$
$|\{\text{Mary, Jane, Ann}\} \cap \{y: y \text{ came in } w\}| \neq 1$

But adding the third alternative will create a contradiction:

(51) $|\{\text{Ann, Jane, Ivy}\} \cap \{y: y \text{ came in } w\}| = 1$ &
$|\{\text{Mary, Jane, Ivy}\} \cap \{y: y \text{ came in } w\}| \neq 1$
$|\{\text{Mary, Jane, Ann}\} \cap \{y: y \text{ came in } w\}| \neq 1$
$|\{\text{Mary, Ivy, Ann}\} \cap \{y: y \text{ came in } w\}| \neq 1$ (a contradiction!)

So we maximally can negate 2 alternatives out of 3. None of them is innocently excludable. EXH has nothing to negate. Its application is vacuous.

Clarification

What was actually proposed in the literature is that the constituent left behind by a modified numeral is an existential *many* (Heim 2000, Hackl 2000, Mayr and Meyer 2014).

(1) $[\![\text{many}]\!]^{g,w} = \lambda n_d.\lambda f_{<et>}.\lambda g_{<et>}.\exists X[|X|=n \ \& \ f(X) \ \& \ g(X)]$

The idea is that many can be transferred into exactly by applying a maximality operator.

See (Buccola & Spector 2016; Mayr & Vostrikova2023 for details).

References: Buccola, B. and B. Spector 2016. Modified numerals and maximality. Ling and Phil 39(3), 151–199; Chierchia, G. 2013. Logic in Grammar: Polarity, Free Choice, and Intervention; Črnic, L. 2021. Exceptives and EXHaustification. Proceedings of WCCFL 39; Gajewski, J. 2008. NPI any and connected exceptive phrases. NaLS(16): 69–110; Gajewski, J. 2013. An analogy between a connected exceptive phrase and polarity items. In Beyond 'Any' and 'Ever': New Explorations in Negative Polarity Sensitivity: 183–212; Hackl, M. 2000. Comparative Quantifiers. Ph. D. thesis, MIT; Heim, I. 2000. Degree operators and scope. In Proceedings of SALT X: 40–64. Hirsch, A. 2016, An unexceptional semantics for expressions of exception. In UPenn Working Papers in Linguistics: Vol. 22 (1): 138–148. Mayr, C. and M.-C. Meyer. More than at least. talk at Two Days at least workshop (2014, September); Mayr, C., & Vostrikova, E. (2023). A unified semantics for exceptive-additive 'besides'. *Proceedings of Sinn Und Bedeutung*, *27*, 399–416. https://doi.org/10.18148/sub/2023.v27.1077. Proceedings of SuB 27.von Fintel, K. 1989. Exception Phrases. In Papers on Quantification UMass: 1-8; von Fintel, K. 1993. Exceptive constructions. NaLS (1): 123–148; von Fintel, K. 1994. Restrictions on quantifier domains: UMass, Amherst Ph.D. thesis.