More backwards association (Erlewine, 2014)

1 Last time

Q: Can the focused constituent move out of the scope of its focus-sensitive operator?

(1) **Associating "backwards":**
α_F ... [*Op* [... ____ ...]] (with α interpreted as the associate of the operator)

Erlewine (2014): In theory: yes. In practice: it's complicated.

There were a number of overt and covert movements where backwards association with *only* is not possible, but backwards association with *even* (and *also*) is possible.

(2) **Backwards association with *even* and *also* but not *only*:**
a. * [Mary]$_F$, John *only* met ____ at the party. (based on Tancredi, 1990, ex. 57b)
b. ✓ [Mary]$_F$, John *even* met ____ at the party.
c. ✓ [Mary]$_F$, John *also* met ____ at the party.

Adopt **the Copy Theory of movement** (Chomsky, 1993). Whenever a focus-sensitive operator seems to associate "backwards," it is actually associating with **F-marking in the lower copy** of the movement chain, which may be unpronounced.

(3) **Copying F-marking:**
a. Narrow syntax: [... α_F ...] ... [*Op* ... [... α_F ...] ...]
b. LF: [... α_F ...] ... [*Op* ... [... α_F ...] ...]
important!
c. PF: [... α_F ...] ... [*Op* ... ~~[... α_F ...]~~ ...]

(4) **When backwards association is not possible:**
a. the base position of movement does not include the F-marking; or
b. the resulting meaning is problematic.

(5) **Two possibilities we dismissed:**
a. Reconstructing the moved constituent back into the scope of the operator;
b. Expanding the scope of *even*: we return to this today.

2 Expanding the scope of *even*

Maybe *even* can extend its scope in some way, so the intended associate is in its LF scope?

(6) a. PF: A [professor]$_F$ will [*even* [come to the party]]
b. LF: *even* [A [professor]$_F$ will [____ [come to the party]]]

This seems promising, as some people already think that *even* covertly moves to take scope higher than its surface position.

(7) **The scalar inference of *even* is reversed in a downward-entailing environment:**
a. Context: Hadas normally doesn't like seafood. But today she was feeling adventurous and ate many things.
✓ Hadas *even* ate the [shrimp]$_F$.
$\rightsquigarrow$ (that Hadas ate the shrimp) $<_{likely}$ (that Hadas ate the <...*alternative*...>) ...
b. Context: Hadas normally loves eating shrimp. But today she was feeling sick and didn't eat anything.
✓ Hadas **didn't** *even* eat the [shrimp]$_F$.
$\rightsquigarrow$ (that Hadas ate the shrimp) $>_{likely}$ (that Hadas ate the <...*alternative*...>) ...

(8) **Two approaches:**
a. The lexical ambiguity theory: (Rooth, 1985, a.o.)
Even is interpreted in its pronounced position, but there are actually two *even*s. (Some languages pronounce them differently.)

$$\left[\!\left[\widehat{even_{\text{PPI}} \quad \alpha_t} \right]\!\right] = \underbrace{\overline{\text{GEN}} \left(\forall \phi \in [\![\alpha]\!]^f \left(\phi \neq [\![\alpha]\!]^o \rightarrow [\![\alpha]\!]^o <_{likely} \phi \right) \right)}_{\text{scalar inference}} \; . \; \underbrace{[\![\alpha]\!]^o \text{ is true}}_{\text{truth condition}}$$

$$\left[\!\left[\widehat{even_{\text{NPI}} \quad \alpha_t} \right]\!\right] = \underbrace{\overline{\text{GEN}} \left(\forall \phi \in [\![\alpha]\!]^f \left(\phi \neq [\![\alpha]\!]^o \rightarrow [\![\alpha]\!]^o >_{likely} \phi \right) \right)}_{\text{scalar inference}} \; . \; \underbrace{[\![\alpha]\!]^o \text{ is true}}_{\text{truth condition}}$$

b. The Scope Theory: (Wilkinson, 1996; Guerzoni, 2004; Nakanishi, 2012)
Even is always the same ($even_{\text{PPI}}$ above), but can move to take the downward-entailing operator in its scope.
i. Narrow syntax: [$_{TP}$ Hadas **didn't** *even* eat the [shrimp]$_F$]
ii. *Even* moves at LF: *even* [$_{TP}$ Hadas **didn't** ____ eat the [shrimp]$_F$]

No such covert, scope-expanding movement has been proposed for adverb *only*.

The hope is that if we adopt the Scope Theory—perhaps with a modification allowing for covert movement of *even* even when there is no downward-entailing operator—we can explain the availability of backwards association with *even* but not *only*, without relying on the Copy Theory.

There are many cases of backwards association where either approach could be used:

(9) ✓ **No** [student]$_F$ *even* came to the party.

(10) **Interpreting (9) with NPI *even*:**
"**No** [student]$_F$ *even*$_{NPI}$ came to the party."

a. Narrow syntax: [**No** [student]$_F$] *even*$_{NPI}$ [$_{vP}$ [**no** [student]$_F$] came to the party]

b. LF: [**No** [student]$_F$] λx *even*$_{NPI}$ [$_{vP}$ [the [student]$_F$ x] came to the party]

c. $[\![vP]\!]^f = \left\{ \begin{array}{l} \text{that the student } x \text{ came to the party,} \\ \text{that the professor } x \text{ came to the party} \end{array} \right\}$

$\longrightarrow_{\text{Local accomodation}} \left\{ \begin{array}{l} \text{that } x \text{ is a student and came to the party,} \\ \text{that } x \text{ is a professor and came to the party} \end{array} \right\}$

d. $\rightsquigarrow$ inference of *even*$_{NPI}$:

$\overline{\text{GEN}}\left(\forall \phi \in [\![vP]\!]^f \left(\phi \neq [\![vP]\!]^o \rightarrow [\![vP]\!]^o >_{likely} \phi\right)\right)$

$\Longleftrightarrow \text{GEN}\,(x \in D_e) \left(\begin{array}{c} \text{that } x \text{ is a student and came to the party } >_{likely} \\ \text{that } x \text{ is a professor and came to the party} \end{array} \right)$

(11) **Interpreting (9) with covert movement of *even*:**

a. Narrow syntax: **No** [student]$_F$ *even* came to the party

b. *Even* moves at LF: *even* [$_{TP}$ **no** [student]$_F$ ___ came to the party]

c. $[\![TP]\!]^f = \left\{ \begin{array}{l} \text{that no student came to the party,} \\ \text{that no professor came to the party} \end{array} \right\}$

d. $\rightsquigarrow$ inference of *even*:

$\overline{\text{GEN}}\left(\forall \phi \in [\![vP]\!]^f \left(\phi \neq [\![vP]\!]^o \rightarrow [\![vP]\!]^o <_{likely} \phi\right)\right)$

$\Longleftrightarrow$ (that no student came to the party) $<_{likely}$ (that no prof came to the party)

☞ But there are many other situations where the covert, scope-expanding movement of *even* makes incorrect predictions for backwards association.

(12) **Scope theory incorrectly predicts no contrast between raising and control:**

a. ✓ **No** [student]$_F$ seems to *even* be at the party.

b. * **No** [student]$_F$ wants to *even* be at the party.
Expected scope theory LF: *even* [**no** [student]$_F$ wants to ___ be at the party]

Note further that we cannot rescue this scope theory by stipulating that the covert movement step of *even* is not possible across a control clause boundary. Under the scope theory of *even*, *even* would have to move in the exact same configuration to explain the scale reversal of *even* in other, grammatical examples with control embeddings:

(13) ✓ **No one** wants to *even* read the [abstract]$_F$ of this terrible paper.
Scope theory: *even* [**no one** wants to ___ read the [abstract]$_F$ of this terrible paper]

3 Varying the associate

The data we've seen so far are all with F-marking in the *restrictor* of a moved DP:

(14) **Associating backwards with F-marking in the restrictor of the moved DP:**

a. Narrow syntax: [$_{\text{DP}}$ Quantifier [...α_{F}...]] ... *even* [... [$_{\text{DP}}$ Quantifier [...α_{F}...]] ...

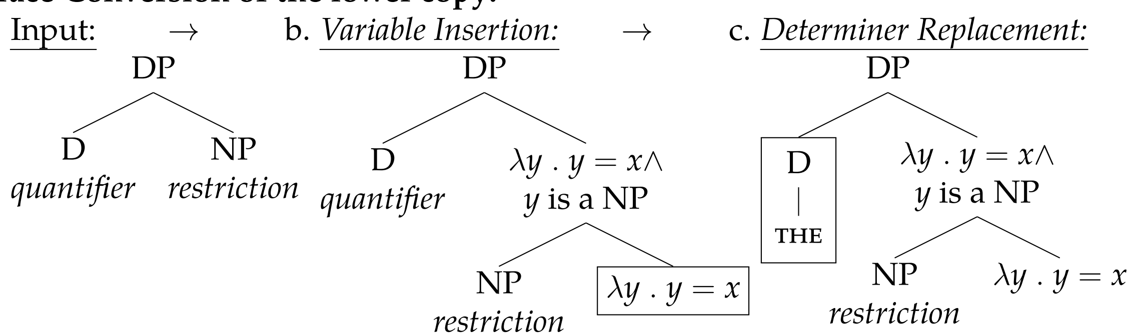
b. LF: [$_{\text{DP}}$ Quantifier [...α_{F}...]] λx ... *even* [... [$_{\text{DP}}$ the [...α_{F}...] x] ...

In this case, Trace Conversion leaves a copy of the F-marked constituent in the scope of the operator. What if we try to associate with the quantifier or with the entire DP?

3.1 Association with quantifiers

Let's take a more detailed look at what Trace Conversion does:

(15) **Trace Conversion of the lower copy:**



The lower copy of the quantifier to be destroyed in the process of Trace Conversion.

(16) ***Even*** **cannot associate backwards with a determiner:**

a. Of course we arrested some protesters. ✓We *even* arrested [every]$_{\text{F}}$ protester.

b. Of course some protesters were arrested. $^{*?}$[Every]$_{\text{F}}$ protester was *even* arrested.

(17) **Hypothetical derivation of (16b):**

a. Narrow syntax: [[Every]$_{\text{F}}$ protester] PAST *even* [[every]$_{\text{F}}$ protester] BE arrested

b. LF after TC: [[Every]$_{\text{F}}$ protester] λx PAST *even* [$_{v\text{P}}$ [the protester x] BE arrested]

(18) ***Even*** **can associate backwards with a determiner** ***in*** **the restrictor:** (DP, p.c.)
Context: For Sue, the problem isn't just a worry that some students won't respond.
✓[Hearing from [every]$_{\text{F}}$ student] wouldn't *even* solve the problem.

Note also that the scope theory of *even* (discussed above) would predict no contrast between backwards association with a restrictor and with a determiner:

(19) **Hypothetical scope theory LFs:**

a. *even* [$_{DP}$ every [protester]$_F$] was ___ arrested.
⇒ predicts backwards association to be possible

b. *even* [$_{DP}$ [every]$_F$ protester] was ___ arrested.
⇒ predicts backwards association to be possible, contrary to fact

3.2 Association with the moved DP

(20) Context: David wants to change the requirements for the Linguistics degree program. The proposal will pass if either (a) at least two-thirds of the professors vote for the change or (b) every student votes for the change. *David knows that it's very unlikely that all the students will be happy with the changes; therefore he is hoping that he can pass the change by getting two-thirds of the faculty on board.*

The votes have been counted and the change was successful. Over two-thirds of the professors voted for the change. But it turns out that the proposal would have passed anyway, even if more of the faculty had voted against it. That's because, surprisingly,

* [Every student]$_F$ (had) *even* voted for the change.

(21) Context: David wants to change the requirements for the Linguistics degree program. The proposal will pass if *both* (a) at least two-thirds of the professors vote for the change *and* (b) every student votes for the change.

The votes have been counted and the proposal did not pass, because less than two-thirds of the faculty voted for the change.

* [Every student]$_F$ (had) *only* voted for the change.

(22) Context: David wants to change the requirements for the Linguistics degree program. The proposal will pass if *both* (a) at least two-thirds of the professors vote for the change *and* (b) every student votes for the change.

The votes have been counted and the proposal passed. Almost all of the faculty voted for the change and...

✓ [Every student]$_F$ (had) *also* voted for the change. (or *ALSO*)

(23) **The structure of backwards association with a DP:**

a. NS: [$_{DP,F}$ Every student] PAST *only/even/also* [$_{vP}$ [$_{DP,F}$ every student] vote...]

b. LF: [$_{DP,F}$ Every student] λ1 PAST *only/even/also* [$_{vP}$ [$_{DP,F}$ the student ①] vote...]
where ① is a variable of type *e*, with index 1.

An important theoretical point about variables: the Trace Converted lower copy, "[$_{\text{DP,F}}$ the student ①]" is of type e, but its denotation is formally distinct from the elements in D_e, which are not variables.[1]

(24) **Alternatives to a trace:**
$[\![①]\!]^f = \{[\![①]\!]^o\} \cup$ (a subset of) $D_e = \{①, \text{John, Mary,...}\}$

Here assume that $[\![\text{[the student ①]}]\!] = [\![①]\!]$, and fix $[\![①]\!]^f$:

(25) $$[\![①]\!]^f = \left\{ ①,\ \underbrace{\text{John, Mary}}_{\textit{students}},\ \underbrace{\text{Irene, Kai}}_{\textit{professors}} \right\}$$

(26) $$[\![v\text{P}]\!]^f = \left\{ \begin{array}{l} \text{that ① voted for the change,} \\ \text{that John voted for the change,} \\ \text{that Mary voted for the change,} \\ \text{that Irene voted for the change,} \\ \text{that Kai voted for the change,} \end{array} \right\}$$

Let's consider what the semantics of different operators predict for the (23).

***Only*:**

(27) $[\![\textit{only}\ v\text{P}]\!]$ = John, Mary, Irene, and Kai all didn't vote for the change
$\Rightarrow$ this will always be false given the prejacent presupposition,[2] and therefore is not an informative assertion.

(28) Gajewski (2002): Structures which necessarily are always false or always true are judged as ungrammatical.

***Also*:**

Assume a simple semantics for *also* which requires that a non-prejacent alternative be true and use generic quantification to close open variables, as we did with *even*:

(29) $[\![\textit{also}\ v\text{P}]\!] \rightsquigarrow \overline{\text{GEN}}\left(\exists \phi \in [\![v\text{P}]\!]^f \left(\phi \neq [\![v\text{P}]\!]^o \wedge \phi \text{ is true}\right)\right)$
$\approx \forall x \in D_e\ (\exists y\ .\ y \neq x \wedge y \text{ voted for the change})$
$\Rightarrow$ this is easily satisfied as long as some individual voted for the change.

See also Rullmann (2003), who proposes that *also* can associate with traces in this way.

[1] In the formalization presented in Erlewine (2014), all semantic denotations are assignment- and world-dependent, with every extensional type τ corresponding to a superintensional type of $\langle a, \langle s, \tau \rangle \rangle$, where a is the type of assignment functions and s is the type of worlds. The lower copy DP here is of type $\langle a, \langle s, e \rangle \rangle$ and the restriction in (24) is a requirement that the alternatives to a node of type $\langle a, \langle s, e \rangle \rangle$ must be constant functions with respect to the assignment function and world arguments.

[2] or if negated above, always true

***Even*:**

(30) $[\![\textit{even}\ v\text{P}]\!] \rightsquigarrow \overline{\text{GEN}} \left(\forall \phi \in [\![v\text{P}]\!]^{f} \left(\phi \neq [\![v\text{P}]\!]^{o} \rightarrow [\![v\text{P}]\!]^{o} <_{likely} \phi \right) \right)$

$$\iff \forall \textcircled{1} \in \{\text{J,M,I,K}\} \begin{pmatrix} \text{that } \textcircled{1} \text{ voted for the change} <_{likely} \text{that John voted for the change} \wedge \\ \text{that } \textcircled{1} \text{ voted for the change} <_{likely} \text{that Mary voted for the change} \wedge \\ \text{that } \textcircled{1} \text{ voted for the change} <_{likely} \text{that Irene voted for the change} \wedge \\ \text{that } \textcircled{1} \text{ voted for the change} <_{likely} \text{that Kai voted for the change} \end{pmatrix}$$

$$\iff \begin{array}{l} \text{that John voted for the change} <_{likely} \text{that John voted for the change} \wedge \\ \text{that John voted for the change} <_{likely} \text{that Mary voted for the change} \wedge \\ \text{that John voted for the change} <_{likely} \text{that Irene voted for the change} \wedge \\ \text{that John voted for the change} <_{likely} \text{that Kai voted for the change} \wedge \\ \text{that Mary voted for the change} <_{likely} \text{that John voted for the change} \wedge \\ \text{that Mary voted for the change} <_{likely} \text{that Mary voted for the change} \wedge \\ \text{that Mary voted for the change} <_{likely} \text{that Irene voted for the change} \wedge \\ \text{that Mary voted for the change} <_{likely} \text{that Kai voted for the change} \wedge \\ \text{that Irene voted for the change} <_{likely} \text{that John voted for the change} \wedge \\ \text{that Irene voted for the change} <_{likely} \text{that Mary voted for the change} \wedge \\ \text{that Irene voted for the change} <_{likely} \text{that Irene voted for the change} \wedge \\ \text{that Irene voted for the change} <_{likely} \text{that Kai voted for the change} \wedge \\ \text{that Kai voted for the change} <_{likely} \text{that John voted for the change} \wedge \\ \text{that Kai voted for the change} <_{likely} \text{that Mary voted for the change} \wedge \\ \text{that Kai voted for the change} <_{likely} \text{that Irene voted for the change} \wedge \\ \text{that Kai voted for the change} <_{likely} \text{that Kai voted for the change} \end{array}$$

$\Rightarrow$ this inference will always be false, and therefore cannot be made, based on a principle like (28).

(31) **Summary of backwards association patterns:**

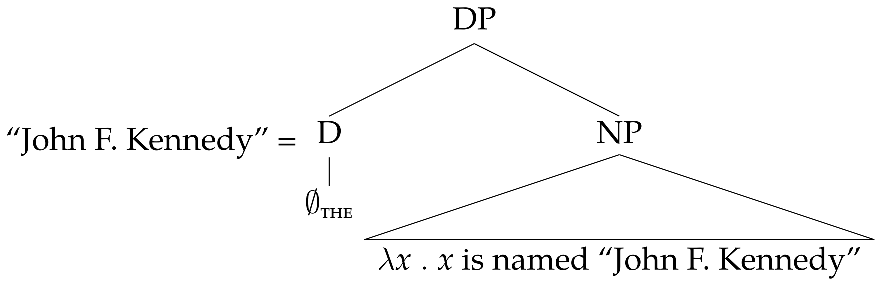
LF configuration	*only*	*even*	*also*
$[_{\text{DP}}$ D ...α_{F}...] ... *Op* [... ____ ...]	×	○	○
DP_{F} ... *Op* [... ____ ...]	×	×	○
$[_{\text{DP}}$ D_{F} ...] ... *Op* [... ____ ...]	×	×	×

3.3 Some apparent counterexamples

(32) **Backwards association with proper names:**
✓[Mary]$_F$, John *even* saw ____ at the party. (=2b)

This is explained under the view that proper names in argument positions are interpreted as definite descriptions (Geurts, 1997; Elbourne, 2002; Matushansky, 2006, a.o.):

(33) **Proper names as definite descriptions:**



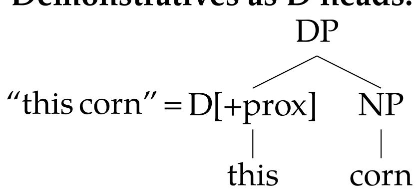
(34) **Proper names can have overt DP layers:**

Ri xta Ana xutëj ri wäy.
the CL$_f$ Ana ate the tortilla

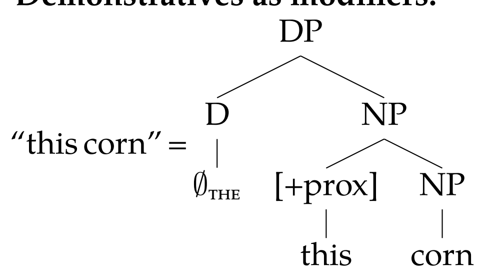
'Ana ate the tortilla.' Kaqchikel

(35) **Backwards association with demonstratives and demonstrative DPs:**
a. [These]$_F$ protesters were *even* arrested. (David Pesetsky, p.c.)
b. I loved that rice. [This corn]$_F$, I *even* loved. (Chris Tancredi, p.c.)

(36) **Demonstratives as D heads:**



(37) **Demonstratives as modifiers:**



(38) **Definite marking independent of demonstratives:**

Ha-teza ha-zot lo ra'a.
DEF-thesis DEF-this$_f$ not bad$_f$

'This thesis is not bad.' Hebrew (Hadas Kotek, p.c.)

3.4 Association with *wh*-phrases

(39) ***Only* cannot associate with a *wh*-word moved above it:**

a. * $[\text{Who}]_F$ did you *only* meet ___? (based on Tancredi, 1990, ex. 57ci)
Intended: Who *x* is such that you met only *x*?

b. * $[\text{Which boy}]_F$ did you *only* meet ___?
Intended: Which boy *x* is such that you met only *x*?

c. * $[\text{Which}]_F$ boy did you *only* meet ___?
Intended: Which boy *x* is such that you met only that boy *x*?

(40) ***Even* can associate with *the restrictor* in a *which*-phrase moved above it:**
He told me [which PRESIDENT he *even* met ___].

a. ✓ He told me [which $[\text{president}]_F$ he *even* met ___].
⇝ it is unlikely for him to meet presidents, cf other sorts of people.

b. * He told me [$[\text{which president}]_F$ he *even* met ___].
⇝ it is unlikely for him to meet the person that he met, cf other people.

(41) Mary has made a series of surprising marriages in her life. #You'll never guess which PERSON she *even* married last year. (David Pesetsky, p.c.)

a. # You'll never guess [which $[\text{person}]_F$ she *even* married last year].
⇝ it is unlikely for Mary to marry people, cf other types of individuals (?).

b. * You'll never guess [$[\text{which person}]_F$ she *even* married last year].
⇝ it is unlikely for Mary to have married the person that she married, as opposed to other people.

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