

Association with traces & the copy theory of movement¹

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1 Introduction

Today I will discuss **Association with Focus**:

- (1) a. John **only/even** introduced [Mary]_F to Sue.
- b. John **only/even** introduced Mary to [Sue]_F.

Focus operators require an **associate** (F-marked constituent) in their scope.

Q: What if the associate moves out of the scope of the associating operator?

- (2) **Principle of Lexical Association (PLA; Tancredi 1990):**
An operator like *only* must be associated with a lexical constituent in its c-command domain.

where *lexical constituent* contrasts with *traces*: focus ops. cannot associate with traces.

2 Today

I will show that the true picture is **more complicated**. Many PLA-violating configurations are indeed ungrammatical, but some are not.

- I will present new data to show that what matters is (a) **the material that is F-marked** and (b) **the semantics of the focus operator involved**;
- propose a **solution using the copy theory of movement** and associated work on the interpretation of movement chains;
- present supporting evidence from **well-known and novel contrasts between *only* and *even***.

NB: Here I limit discussion to English VP-*only* and VP-*even*, and to the movement of DPs. I follow the Alternative Semantics framework of Rooth (1985, 1992).

¹I thank Danny Fox, Martin Hackl, Irene Heim, Chris Kennedy, Hadas Kotek, David Pesetsky, Chris Tancredi, Maziar Toosarvandani, and audiences at the GLOW 35 workshop on Association with Focus, MIT Ling 50, and MIT LF Reading Group for helpful discussion and criticism. Errors are mine.

3 Data

Tancredi (1990): PLA in overt movement

- (3) a. * [John]_F, I **only** saw __.
 Intended: 'I only saw [John]_F.'
- b. * [Who]_F do you **only** like __?
 Intended: 'You only like [who]_F.'

Aoun and Li (1993): PLA affects covert movement (quantifier scope)

- (4) *Baseline*: Someone wants to meet [every boy in the room].
a. ✓ *someone > every boy*:
 someone wants to [[every boy in the room] [PRO meet t]]
 ↑
b. ✓ *every boy > someone*:
 [every boy in the room] [someone wants to [PRO meet t]]
 ↑
- (5) Someone wants to **only** meet [every [boy]_F in the room].
a. ✓ *someone > every boy*:
 someone wants to **only** [[every [boy]_F in the room] [PRO meet t]]
 ↑
b. * *every boy > someone*:
 [every [boy]_F in the room] [someone wants to **only** [PRO meet t]]
 ↑
 ×

The PLA effect on QR can also be seen in Antecedent-Contained Deletion (ACD). Following Sag (1976); May (1985, a.o.), ACD resolution requires QR in order to create an antecedent which does not contain the gap.

- (6) *Baseline*: John wants to read [every book that Mary did __].
a. ✓ "read":
 John wants to [[every book that Mary did __] [*antecedent* read t]]
 ↑
b. ✓ "want to read":
 John [[every book that Mary did __] [*antecedent* wants to read t]]
 ↑
- (7) John wants to **only** read [every [book]_F that Mary did __].
a. ✓ "read":
 John wants to **only** [[every [book]_F that Mary did __] [*ant* read t]]
 ↑
b. * "want to read":
 John [[every [book]_F that Mary did __] [*ant* wants to **only** read t]]
 ↑
 ×

The PLA's effect on covert movement can also be observed in readings of multiple *wh*-questions. Pair-list readings of multiple *wh*-questions require covert movement of the in-situ *wh*-word to C (Dayal, 1996, 2002, a.o.).

- (8) *Baseline*: I can tell you [which student read which book].
✓ single pair, ✓ pair list
- (9) I can tell you [which student **only** read [which book]_F].²
✓ single pair, *pair list

☞ However, **the facts are different with *even***.

- (10) [John]_F, they **even** consider __ intelligent. (Kayne, 1998, fn. 75)
- (11) Someone wants to **even** meet [every [boy]_F in the room].
✓ someone > every boy, ✓ every boy > someone
- (12) John wants to **even** read [every [dissertation]_F that Mary did __].
✓ "want to read," ✓ "read"

What exactly is *even* contributing in such cases?

- (13) Which président did you **even** meet __?
a. ✓ Which [président]_F did you **even** meet __?
 ~ it is unlikely for you to meet presidents.
b. * [Which président]_F did you **even** meet __?
 ~ it is unlikely for you to meet the person that you met.

In fact, simplex *wh*-words do not allow this PLA-violating association:

- (14) * [Who]_F did you **even** meet __?

Summary

☞ Some PLA-violating associations are grammatical. What matters is (a) **the material that is F-marked** and (b) **the focus operator involved**:

- (15) **Acceptability of PLA-violating associations:**

What is F-marked:	<i>only</i>	<i>even</i>
Names (<i>John</i>)	*	✓
Inside a DP (<i>président, boy</i>)	*	✓
A whole DP (<i>which président, who</i>)	*	*

²Note that this is a superiority-obeying multiple *wh*-question, so it is not an intervention effect of the sort in Pesetsky (2000); Beck (2006).

4 Background: the copy theory of movement

There are various syntactic reasons why we believe movement to leave copies instead of traces. The Binding Condition facts below can be adequately explained if lower copies are left instead of simple traces.

- (16) **Condition A:**
✓ [Which picture of herself_i] does Sue_i like __?
- (17) **Condition C:** (ex Fox 2002)
?? Guess [which friend of John's_i] he_i visited *t*.

The lower copy must be tweaked in order to interpret the movement chain.

☞ The lower copy is converted into a definite description, with the restriction that it be equal to the variable in question, through a process of **Trace Conversion (TC)** (Rullmann and Beck, 1998; Fox, 2002):

- (18) **Trace Conversion of the lower copy:**
"John read every book."
QR: [every book] λx_i John read [every book]_i
TC: [every book] λx John read [the book *x*]

Formally, Trace Conversion can be decomposed into two distinct operations:

- (19) **Decomposing Trace Conversion:**

<p>a. <u>Input:</u> →</p> <pre> DP ├── D │ │ every │ └── NP │ └── book </pre>	<p>b. <u>Variable Insertion:</u> →</p> <pre> DP ├── D │ │ every │ └── λy.y = x ∧ │ └── y book </pre> <pre> NP └── λy.y = x └── book </pre>	<p>c. <u>Determiner Replacement:</u></p> <pre> DP ├── D │ │ the │ └── λy.y = x ∧ │ └── y book </pre> <pre> NP └── λy.y = x └── book </pre>
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5 Proposal: F-marking within a copy theory of movement

F-marking itself is simply a syntactic feature on constituents (Jackendoff, 1972), and thus when a constituent containing F-marking moves, the F-marking is retained on both copies. The generation of focus alternatives occurs in both positions, but focus operators simply consider the alternatives in their scope.

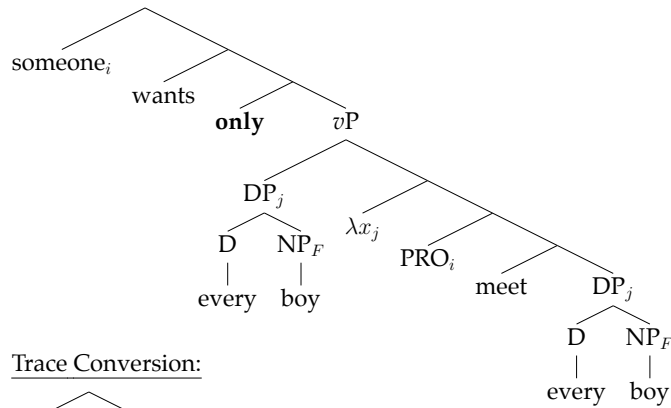
5.1 F-marking in the restriction

Consider the two (potential) readings for (5):

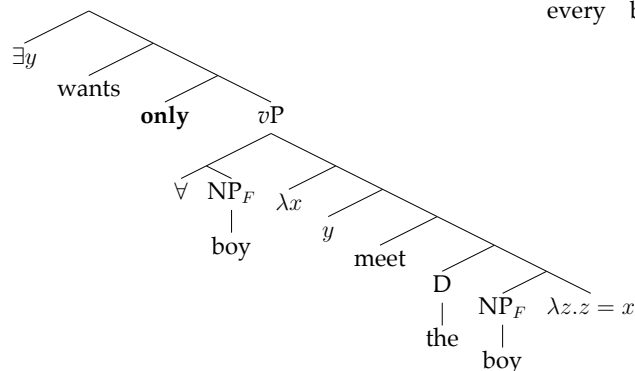
- (5) Someone wants to **only** meet [every [boy]_F in the room].

Case I (DP containing associate moves *within* the operator's scope:

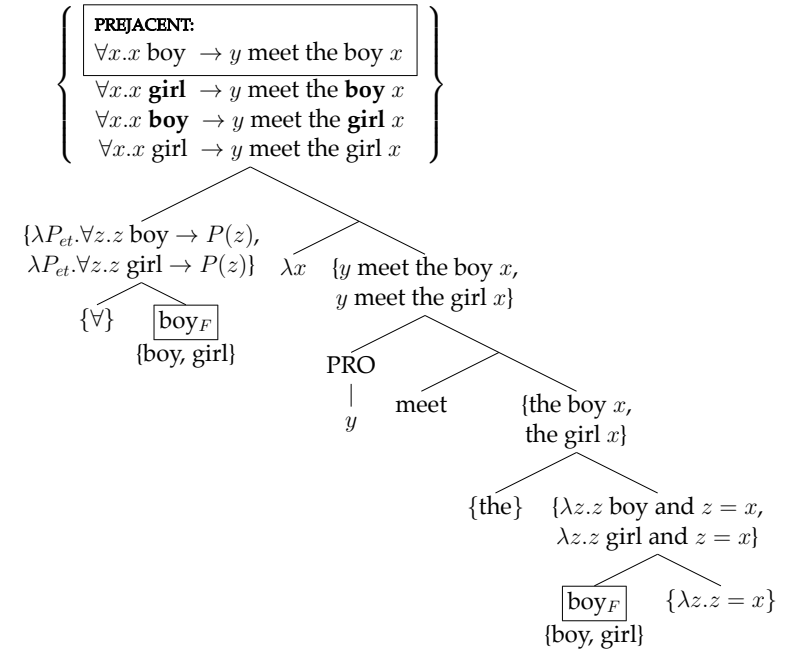
- (20) a. Quantifier Raising:



- b. Trace Conversion:



- c. Computing $[[vP]]^f$:



The alternatives “ $\forall x.x \text{ girl} \rightarrow y \text{ meet the boy } x$ ” and “ $\forall x.x \text{ boy} \rightarrow y \text{ meet the girl } x$ ” always involve a contradictory presupposition.

☞ Alternatives which trigger presupposition failure are not considered.

$$(21) \quad [[vP]]^f = \left\{ \begin{array}{l} \text{PREJACENT:} \\ \forall x.x \text{ boy} \rightarrow y \text{ meet the boy } x \\ \forall x.x \text{ girl} \rightarrow y \text{ meet the girl } x \end{array} \right\}$$

$$(22) \quad [[\text{only } vP]] = \neg \forall x.x \text{ girl} \rightarrow y \text{ meet the girl } x$$

$$(23) \quad [[(20)]] = \exists y.y \text{ wants } (\neg \forall x.x \text{ girl} \rightarrow y \text{ meet the girl } x) \quad \odot$$

Support for eliminating alternatives with unsatisfied presuppositions

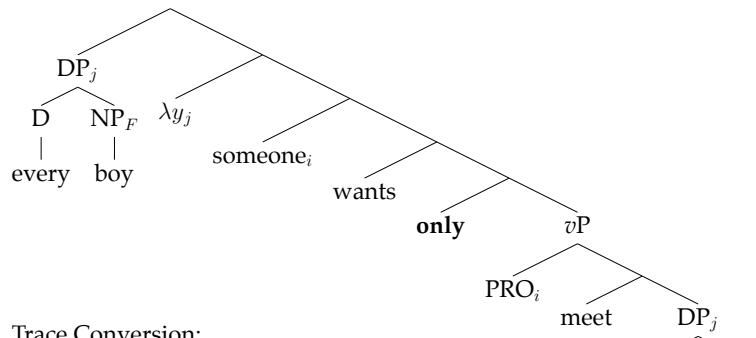
- (24) Context: we are going to sell red, green, and blue shirts, so we are doing a photo shoot. The red shirt is modeled by a boy, the green shirt is modeled by another boy, and the blue shirt is modeled by a girl.

- (25) ✓ I only saw the boy with the [red]_F shirt.

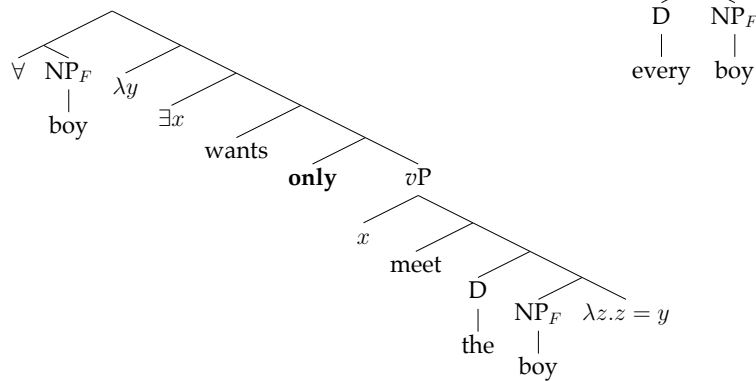
We expect (25) to mean “I did not see [the boy with the green shirt] and I did not see [the boy with the blue shirt],” but there is no “the boy with the blue shirt.” I claim that the alternative proposition “I saw [the boy with the blue shirt]” is removed.

Case II (DP containing associate moves *out* of the scope of *only*):

(26) a. Quantifier Raising:



b. Trace Conversion:



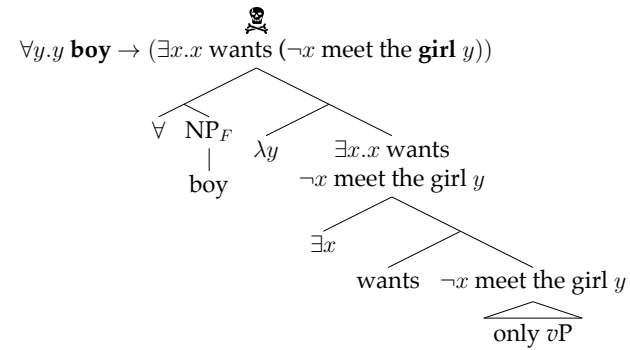
There are now two F-marked *boys* in the structure, but *only one is in the scope of only*. Compute $[[vP]]^f$:

$$(27) \llbracket \text{boy} \rrbracket^f = \left\{ \left[\begin{array}{l} \text{PREJACENT:} \\ \lambda x.x \text{ boy} \end{array} \right], \lambda x.x \text{ girl} \right\}$$

$$(28) \llbracket vP \rrbracket^f = \left\{ \left[\begin{array}{l} \text{PREJACENT:} \\ x \text{ meet the boy } y \end{array} \right], x \text{ meet the girl } y \right\}$$

$$(29) \llbracket \text{only } vP \rrbracket = \neg x \text{ meets the girl } y$$

(30) Interpreting the rest of the assertion:



For every choice of $y \in \llbracket \text{boy} \rrbracket$, the computation of “the girl y ” projects the presupposition that $y \in \llbracket \text{girl} \rrbracket$. Assuming $\llbracket \text{boy} \rrbracket$ and $\llbracket \text{girl} \rrbracket$ are disjoint, this leads to presupposition failure regardless of the particular choice of y , making the “every boy > someone” reading of (5) unavailable.

Disjointness

An important assumption above is that the alternatives (*boy* and *girl* above) are disjoint. There is evidence that the alternatives used by *only* are always restricted to be disjoint.

(31) **A strange conversation**

- A: John is so dreamy. I wonder what kind of people he dates. Does he date men? Women? Syntacticians? Semanticists?
 B: He **only** dates syntacticians_F.
 C: # No, you’re wrong! He also dates men!

(31B) must only assert that “John does not date semanticists_F,” since “semanticists” is the only category disjoint from the prejacent’s “syntactician.” It does not further assert that “John does not date men and John does not date women.”

Case III: (DP containing associate moves out of the scope of *even*):

The explanation for PLA effects proposed here depends on the semantics of *only*. In particular, *even* does not affect the truth-conditions of its assertion at all and instead introduces the following non-assertive inference (Horn, 1969):

- (32) **Scalar inference of [*even* α]:**
 $\forall \varphi \in [[\alpha]]^f [\varphi \neq [\alpha]] \rightarrow \varphi \succ_{\text{likely}} [[\alpha]]$

☞ Under a copy theory of movement, *even* can associate with the F-marked predicate of the lower copy in its scope.

- (13a) Which [president]_F did you **even** meet ___?
 \sim it is unlikely for you to meet a president.

- (33) [Which [president]_F] [you **even** met [which [president]_F]]

TC: [which [president]_F] λx **even** [_{α} you met [the [president]_F x]]

- (34) $[[\text{president}]^f = \left\{ \begin{array}{l} \text{PREJACENT:} \\ \lambda x.x \text{ president} \end{array} \right\}, \lambda x.x \text{ senator}, \lambda x.x \text{ governor} \left\}$

- (35) $[[\alpha]^f = \left\{ \begin{array}{l} \text{PREJACENT:} \\ \text{you met the president } x \\ \text{you met the senator } x, \\ \text{you met the governor } x \end{array} \right\}$

Even computes its scalar inference on the basis of these alternatives and the scalar inference will not compose with material above *even*. The free variables in the alternatives are existentially closed.

- (36) **Scalar inference of (33):**
 $\exists x . \text{you met the senator } x \succ_{\text{likely}} \exists x . \text{you met the president } x \wedge$
 $\exists x . \text{you met the governor } x \succ_{\text{likely}} \exists x . \text{you met the president } x$

(36) is satisfied in a context where it is relatively unlikely to meet a president. The actual question posed by (33) is not affected by the addition of *even*.

☞ In this way, **I predict no PLA effect for VP-*even*** as long as the scalar inference can be satisfied by associating with a lower copy.

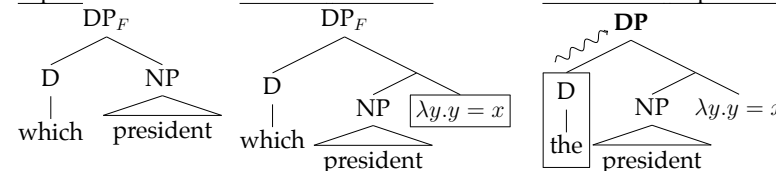
5.2 F-marking on the whole DP

Recall that moving an entire associate DP out of the scope of a focus operator is always ungrammatical, for both *only* and *even*.

- (37) * [Which president]_F did you **even/only** meet ___?

☞ In the process of Determiner Replacement, the DP must get *relabelled* to match the new determiner. In this process, the F-marking is lost.

- (38) **Determiner Replacement destroys F-marking on the entire DP:**
 a. Input: \rightarrow b. Variable Insertion: \rightarrow c. Determiner Replacement:



Even for *even*, then, there is no F-marking retained in the lower copy and therefore *even* does not have an associate in its scope.

Relating to an alternative approach

A previous attempt at providing a deeper explanation for PLA effects was to say that, in general, traces cannot have any F-marking. Beaver and Clark (2008) provide a PF motivation for this:

“By definition, extraction gaps cannot be prosodically prominent.”

—Beaver and Clark (2008, p. 172)

Under simple Heim and Kratzer (1998) assumptions, traces and bound pronouns have the same semantics of a variable. Bound pronouns, however, can phonetically realize F-marking. The contrast between (37,39) thus seems to support this view:

- (39) ✓ Which president is such that_i you **only** met [him_i]_F? (cf 37)

My proposal can explain this contrast without resorting to the phonological realization of F-marking. In (37), the lower copy of movement will get its F-marking destroyed in the process of Determiner Replacement. In (39), the bound variable is not a lower copy of movement and hence retains its F-marking.

☞ The view that gap positions cannot be even *contain* F-marking, because gaps are not realized phonologically, would not allow for the grammatical, PLA-violating examples with *even* presented here.

5.3 F-marking on a name

Recall that the movement of associate *names* patterns with associates in the restriction of DPs—not with whole DPs which are F-marked—in allowing for PLA-violating associations with *even*:

- (10) [John]_F, they **even** consider __ intelligent. (Kayne, 1998, fn. 75)

This is resolved by adopting the view that proper names as a definite description with silent (in English) definite determiners (Geurts, 1997; Elbourne, 2002; Matushansky, 2006, a.o.). What is F-marked in (10), then, is the *restrictor* “John,” not the entire DP “[_{the} John]_F.”

6 Subject focus with VP-*even*

One well-known difference between *only* and *even* is that VP-*even* can associate with a pre-verbal subject, but not VP-*only* (Jackendoff, 1972, p. 250; a.o.).

- (40) **VP-*even* can associate with subject, but not VP-*only***
a. ✓ A [professor]_F is **even** at the party.
b. * A [professor]_F is **only** at the party.

☞ Assuming the subject was base-generated vP-internally, the explanation of the PLA here can explain this contrast.³

- (41) **Support from raising vs control contrast:**
a. ✓ A [professor]_F seems to **even** be at the party.
b. * A [professor]_F wants to **even** be at the party.

Note, however, Irene Heim (p.c.) has pointed out a problem with this approach for downward entailing quantifiers:

- (42) Context: we held a party with free food, but not that many people came.
(43) ✓ Few [graduate students]_F **even** came to the party.

The felicitous use of *even* in (43) is licensed because it is surprising that *few* graduate students would show up at a party with free food. If the scalar inference were instead that it is unlikely that graduate students would come to the party, the sentence would be infelicitous, at least based on this author’s world knowledge.

I will leave this puzzle open.

³Kayne (1998, fn. 75) alludes to this approach: “...given a VP-internal trace of the subject, [an example of VP-*even* associating with a subject] might be an instance of VP-focus under reconstruction.” He does not, however, provide much support for this approach nor an explanation for the contrast between *only* and *even* in this regard.

7 Conclusion

Today I discussed **the empirical landscape of Tancredi’s (1990) Principle of Lexical Association** and proposed a principled explanation for this pattern based on the independently-motivated **copy theory of movement**. Specifically:

- *F* is a syntactic feature which gets copied under movement.
- For F-marking in the restriction:
 - movement within the scope of the focus operator is possible, due to **the elimination of alternatives with unsatisfiable presuppositions**;
 - movement across *only* becomes uninterpretable, because of **conflicting requirements introduced on variables being quantified over**;
 - movement across *even* is interpretable, by **associating with F-marking in the lower copy** and projecting its non-assertive inference.
- F-marking on entire DPs is eliminated in the process of Trace Conversion.
- F-marking on names patterns with F-marking on restrictions, explained by **modeling names as definite descriptions**.

Neither Tancredi’s (1990) original formulation, nor the proposal that unpronounced material cannot be F-marked (Beaver and Clark, 2008), predict the pattern observed.

This also offers a new explanation for **the availability of subject focus with VP-*even*** but not VP-*only*.

Handout with references: <http://mitcho.com/academic/handout-sub2013.pdf>