Association with traces & the copy theory of movement[1]

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1 Introduction

(1) a. * [John]$_F$ **only** seems __ to be happy. (Tancredi, 1990)
Intended: 'It only seems that [John]$_F$ is happy.'
b. * [John]$_F$, I **only** saw __
Intended: 'I only saw [John]$_F$?'
c. * [Who]$_F$ do you **only** like __?
Intended: 'You only like [who]$_F$?'

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

2 Goals of this talk

I propose that **PLA effects result from the semantics of *only* itself**, rather than a general inability to associate with material which has been displaced. In particular:

- I will review previous explanations of the PLA as **a ban on F-marked traces**;
- present **two reasons to be skeptical** of this view;
- 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: Today I will limit discussion to English VP-*only* and *even*. I follow the Alternative Semantics framework of Rooth (1985, 1992).

[1]I thank Maziar Toosarvandani, Irene Heim, Chris Tancredi, David Pesetsky, Martin Hackl, Hadas Kotek, Chris Kennedy, and audiences at the GLOW in Asia Workshop for Young Scholars, MIT Ling 50, and MIT LF Reading Group for helpful discussion and criticism. It's to this author that all errors only belong.

3 More PLA effects

In this talk I use the label **"PLA effects"** to describe configurations where the semantic focus of a focus operator is moved (overtly or covertly) outside of the surface c-command domain of a focus operator, leading to ungrammaticality / uninterpretability.

(3) 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]]

As "want" is a control verb, "someone" cannot reconstruct below "want." For "every boy" to take wide scope, it must have QRed above "someone."

(4) **PLA effect on QR height:** (ex based on Aoun and Li, 1993)
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]]

(5) **Antecedent-Contained Deletion** resolved via QR (May, 1985, a.o.):
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]]

(6) **PLA effect on possible ACD resolutions:**
John wants to **only** read [every [book]$_F$ that M 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]]

4 Previous approach: a ban on F-marked traces

☞ Focus operators require a focus in its scope and traces can't be F-marked.

If there is no F-marked material in the complement of a focus operator, the focus alternatives computed at that position will be a singleton set. The semantic contribution of *only* and *even* are vacuous when there are no alternatives.[2]

But why can't traces be F-marked?

> *"By definition, extraction gaps cannot be prosodically prominent."*
> —Beaver and Clark (2008, p. 172)

4.1 Support from bound variables

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 following contrasts thus, at first glance, support this prosodic prominence view:

(7) a. * [Which boy]$_i$ does John only like [t$_i$]$_F$?
b. ✓ Which boy is such that$_i$ John only likes [him$_i$]$_F$?

(8) a. * I've met no girl who$_i$ John only likes [t$_i$]$_F$
b. ✓ I've met no girl who$_i$ thinks that John only likes [her$_i$]$_F$.

4.2 Reason for skepticism 1: *only* vs *even*

If traces simply can't be F-marked, **we expect the exact same effects between focus operators, e.g. *even* and *only***.

(9) **VP-*even* associating with topicalized constituent** (Kayne, 1998, fn. 75)
[John]$_F$, they even consider __ intelligent.

(10) **No PLA effects on QR with *even*:**
Someone wants to **even** meet [every [boy]$_F$ in the room].
✓someone > every boy, ✓every boy > someone

(11) **No PLA effects on ACD ellipsis resolutions with *even*:**
John wants to **even** read [every [book]$_F$ that M did __].
✓"want to read," ✓"read"

[2] Put another way, singleton alternative sets violate Rooth's (1985) Focus Interpretation Principle which requires that there be at least one other alternative aside from the prejacent.

4.3 Reason for skepticism 2: prosodic prominence at PF

The requirement to realize prosodic prominence on the F-marked constituent within the scope of the focus operator makes sense for the overt movement cases and accurately predicts the contrasts in (7–8). However, **in the case of the QR examples, F-marking is realized prosodically within the scope of the focus operator at PF/S-structure** and yet we observe PLA effects:

(4) Someone wants to **only** meet [every [boy]$_F$...]. * every boy > someone

PLA effects seem to disallow F-marked quantifiers from scoping above the focus operator, **regardless of whether the scope taking is overt or covert**. That is, the PLA seems to apply at LF (Aoun and Li, 1993; Tancredi, 1990). It seems incongruous to apply a prosodic requirement at LF.

5 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.

(12) **Condition A:**
[Which picture of herself$_i$] does Sue$_i$ like __?

(13) **Condition C:** (examples from Fox 2002)
a. ?? Guess [which friend of John's$_i$] he$_i$ visited t.
b. ?* Someone introduced him$_i$ to [every friend of John's$_i$].
(inverse scope reading)

The lower copy must be tweaked in order to interpret movement chains. 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)** (Fox, 2002; Rullmann and Beck, 1998):

(14) **Trace Conversion of the lower copy:**
"John read many books."
QR: [many books] λx_i John read [many books]$_i$
TC: [many books] λx John read [the book x]

Formally, "the book x," for example, is $\iota y.y$ is a book and $y = x$. Syntactically, Trace Conversion involves replacement of the D with ι and adjunction of the predicate $\lambda y.y = x$ to NP, where x is the bound variable.

6 Proposal: F-marking within a copy theory of movement

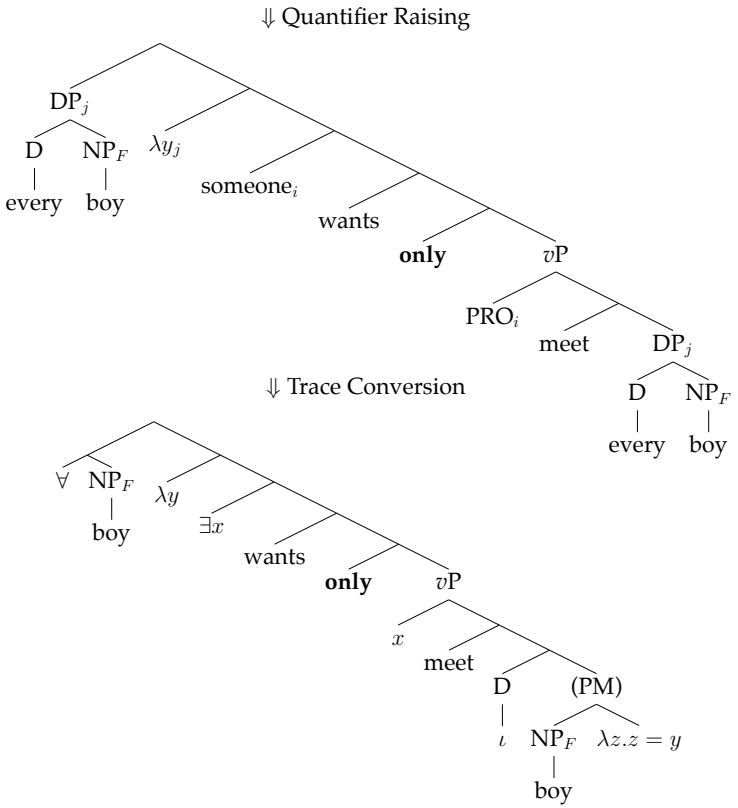
> F-marking itself is simply a syntactic feature on constituents (Jackendoff, 1972), and thus when a constituent containing F-marking moves, the F-marking is retained on both copies. The generation of focus alternatives occurs in both positions, but focus operators simply consider the alternatives in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

Consider two (potential) readings for (4):

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

Case I (XP containing F-marking moves out of the scope of *only*):

(15)



There are now two F-marked *boy*s in the structure, but *only one is in the scope of* only. Compute $[\![v\text{P}]\!]^f$ pointwise:

(16) $[\![\text{boy}]\!]^f = \left\{ \boxed{\begin{array}{l}\textbf{PREJACENT:}\\ \lambda x.x \text{ boy}\end{array}}, \lambda x.x \text{ girl} \right\}$

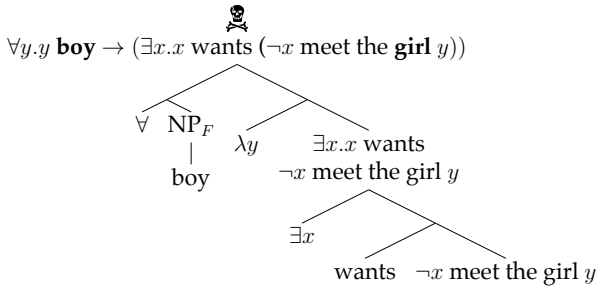
(17) $[\![v\text{P}]\!]^f = \left\{ \boxed{\begin{array}{l}\textbf{PREJACENT:}\\ x \text{ meet the boy } y\end{array}}, x \text{ meet the girl } y \right\}$

Compute the assertion of *only* (cf Horn, 1969):

(18) $[\![\text{only } \alpha]\!] = \bigwedge_{\varphi \in [\![\alpha]\!]^f, \varphi \neq [\![\alpha]\!]} \neg\varphi$

(19) $[\![\text{only } v\text{P}]\!] = \neg x$ meets the girl y

(20)

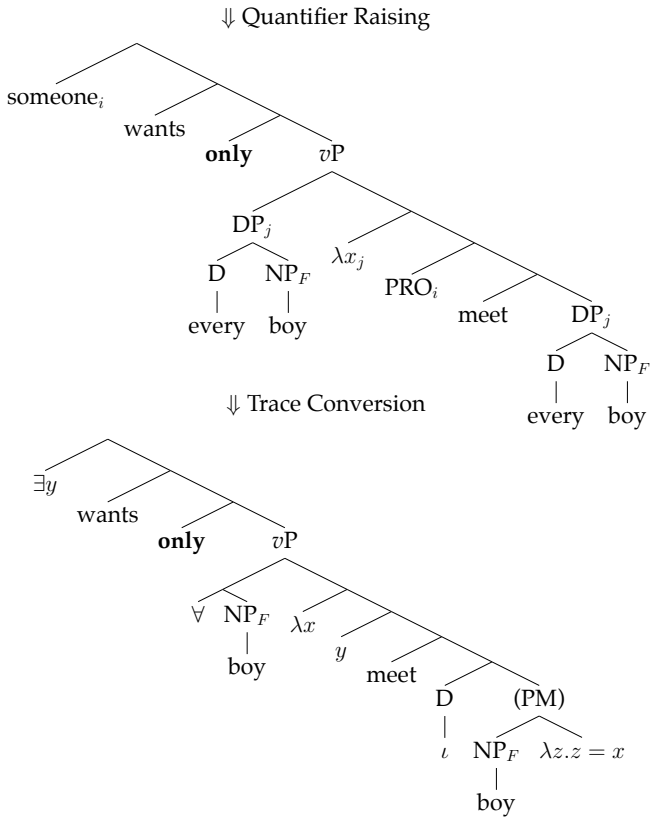


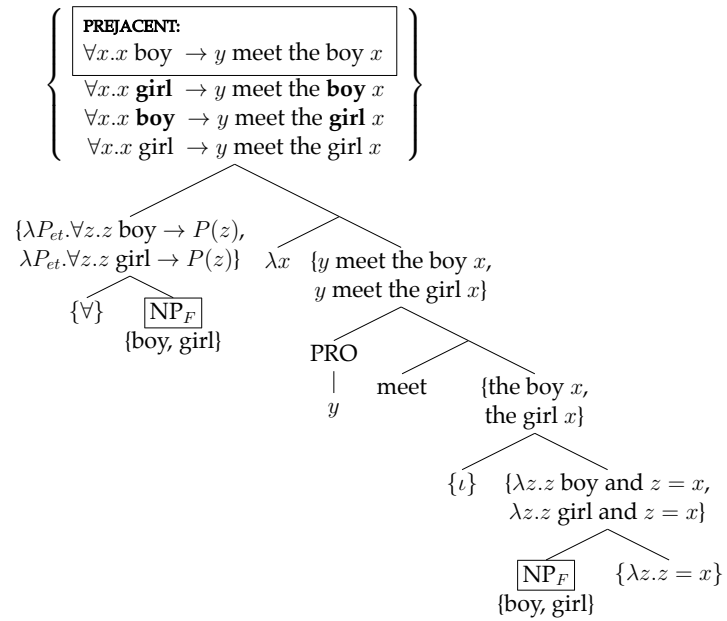
For every choice of $y \in [\![\text{boy}]\!]$, the computation of "the girl y" projects the presupposition that $y \in [\![\text{girl}]\!]$. Assuming $[\![\text{boy}]\!]$ and $[\![\text{girl}]\!]$ are disjoint, this leads to presupposition failure regardless of the particular choice of y, making the "every boy > someone" reading of (4) unavailable.[3]

[3] This explanation predicts that PLA effects for *only* may disappear in situations in which the extension of the predicate in the prejacent is not disjoint from any other alternative. It is difficult to construct such uses of *only*, though. This may reflect a more general requirement that the alternatives considered be disjoint.

Case II (XP containing F-marking moves within the scope of *only*):

(21)





However, the alternatives "$\forall x.x$ **girl** $\rightarrow$ y meet the **boy** x" and "$\forall x.x$ **boy** $\rightarrow$ y meet the **girl** x" always involve a contradictory presupposition. Alternatives which trigger presupposition failure are not considered.

(22) $[\![v\text{P}]\!]^f = \left\{ \boxed{\begin{array}{l}\textbf{PREJACENT:}\\ \forall x.x \text{ boy } \rightarrow y \text{ meet the boy } x\end{array}}, \forall x.x \text{ girl } \rightarrow y \text{ meet the girl } x \right\}$

(23) $[\![\text{only } v\text{P}]\!] = \neg\forall x.x \text{ girl} \rightarrow y \text{ meet the girl } x$

(24) $[\![(21)]\!] = \exists y.y \text{ wants } (\neg\forall x.x \text{ girl} \rightarrow y \text{ meet the girl } x)$

6.1 Eliminating alternatives with unsatisfied presuppositions

Independent evidence for the elimination of alternatives with presuppositions which are not satisfied (undefined under a partial semantics) comes from sentences such as the following:

(25) 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.

(26) ✓ I only saw the boy with the [red]$_F$ shirt.

6.2 The contrast between traces and bound variables

(7) a. * [Which boy]$_i$ does John only like [t$_i$]$_F$?
b. ✓ Which boy is such that$_i$ John only likes [him$_i$]$_F$?

Explanation: PLA effects occur because of the F-marked predicate in the lower "trace" position. Together with the higher predicate "boy," this introduces conflicting requirements on the variables being quantified over. F-marking on the pronoun does not introduce such conflicting requirements.

7 *even* vs *only*

> *"In the remainder of this paper, I will ignore this complication* [VP-*even* associating with subjects], *and deal exclusively with sentences in which* even *and* only *behave identically."* —Tancredi (1990, fn. 1)

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 (Horn, 1969) and instead introduces the following additional, non-assertive inference:

(27) **Scalar inference of [*even* α]:**
$\forall\varphi \in [\![\alpha]\!]^f[\varphi \neq [\![\alpha]\!] \rightarrow \varphi >_{likely} [\![\alpha]\!]]$

7.1 VP-*even* associating with the lower copy

Under a copy theory of movement, *even* can associate with an F-marked predicate in its scope, even if it is the lower copy of a constituent which as moved out overtly or covertly.

syntax
phonology
syntax
syntax
phonology
semantics
syntax
syntax
phonology

(28) Context: John does syntax and phonology but hates semantics. He goes to GLOW and, when talking to people, keeps track of what fields they're in. John returns home and shows Mary his list, reproduced to the right.

(29) ✓ Which [semanticist]$_F$ did you even talk to __!?

(29′) [which [semanticist]$_F$] [you **even** talk to [which [semanticist]$_F$]]

TC: [which [semanticist]$_F$] λx **even** [$_\alpha$ you talk to [the [semanticist]$_F$ x]]

(30) $[\![\text{semanticist}]\!]^f = \left\{ \boxed{\begin{array}{l}\textbf{PREJACENT:}\\ \lambda x.x \text{ semanticist}\end{array}}, \lambda x.x \text{ syntactician}, \lambda x.x \text{ phonologist} \right\}$

(31) $[\![\alpha]\!]^f = \left\{ \begin{array}{l} \boxed{\begin{array}{l}\textbf{PREJACENT:}\\ \text{you talked to the semanticist } x\end{array}}, \\ \text{you talked to the syntactician } x, \\ \text{you talked to the phonologist } x \end{array} \right\}$

Even computes its scalar inference on the basis of these alternatives and the scalar inference will not compose with material above *even*. Each variable x is free and can be interpreted as any individual which satisfies the presuppositions on x.

(32) **Scalar inference of (29):**
you talked to the phonologist $x_i >_{likely}$ you talked to the semanticist $x_j \wedge$
you talked to the syntactician $x_k >_{likely}$ you talked to the semanticist x_l

(32) is satisfied in the context (28) and (29) is grammatical and felicitous. The actual question posed by (29) 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.

This is borne out in the examples repeated below:

(9) **VP-*even* associating with topicalized constituent** (Kayne, 1998, fn. 75)
[John]$_F$, they even consider __ intelligent.

(10) **No PLA effects on QR with *even*:**
Someone wants to **even** meet [every [boy]$_F$ in the room].
✓someone > every boy, ✓every boy > someone

(11) **PLA affects possible ACD ellipsis resolutions:**
John wants to **even** read [every [book]$_F$ that M did __].
✓"want to read," ✓"read"

7.2 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.).

(33) **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.[4]

(34) **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.

As trace conversion "replaces" the quantificational part of the lower copy, VP-*even* can't associate with the quantificational part of a subject:

(35) **Support from ungrammaticality of focus on quantificational part:**
  a. Of course we arrested ten protesters. We **even** arrested [fifty]$_F$ protesters!
  b. * Of course ten protesters were arrested. [Fifty]$_F$ protesters were **even** arrested!

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

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

The felicitous use of *even* in (37) 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.

[4] Kayne (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.

8 Conclusion

Today I presented **a new, principled explanation to PLA effects**, where an operator containing F-marking is unable to scope over its associating focus operator.

The approach here requires that **a copy of the F-marked constituent remains within the "trace" position**. PLA effects occur when the semantics of *only* introduce the alternatives within the lower copy's restriction, introducing **conflicting requirements on the variables being quantified over**.

The approach correctly predicts a lack of PLA effects for English VP-*even*. This offers a new explanation for **the availability of subject focus with VP-*even***.

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