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Cross-categorial donkeys

Dynamic alternative semantics for ellipsis

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Three empirical pieces

Three empirical pieces (1/8)

#1: Surprising sloppy readings

By which I mean the indicated readings of (1) and (2) (Tomioka (1999), references therein; Hardt (1999); Schwarz (2000); a.o.).

- SMALL CAPS is pitch accent. *Gray italics* is the meaning of unpronounced stuff. *Underlined* is the surprising sloppiness.

(1) The cop who arrested Jon$_i$ [$_A$ INSULTED him$_i$]
The cop who arrested BILL$_j$ DIDN'T [$_E$ *insult him$_j$*]

(2) If Jon has to cook, he doesn't [$_A$ WANT to *cook*]
If he has to CLEAN he doesn't [$_E$ *want to clean*] EITHER.

Why surprising? *Binding* usually considered necessary for sloppy readings (sloppiness, roughly: when A and E seem to "mean" different things) (Sag 1976; Williams 1977; Rooth 1992a).

Three empirical pieces (2/8)

Concretely: assume Rooth's (1992a) **two-part** theory of ellipsis licensing. That is, $\langle A, E\rangle$ is a good ellipsis-pair iff...

- **Identity**: A and E are *identical up to indices/F-marks*.
- **Contrast**: there are YP_A, YP_E dominating A and E such that $YP_A \sim YP_E$; i.e. $[\![YP_A]\!]^g \neq [\![YP_E]\!]^g$ and $[\![YP_A]\!]^g \in \langle\!\langle YP_E\rangle\!\rangle^g$, with $\langle\!\langle\cdot\rangle\!\rangle^g$ Rooth's (1985) function into focus sets.

Roothian **alternative semantics**:

- Focus values for non-F-marked terminals: $\langle\!\langle\alpha\rangle\!\rangle^g = \{[\![\alpha]\!]^g\}$
- Focus values for F-marked nodes: $\langle\!\langle\alpha_{\mathrm{F}}\rangle\!\rangle^g = \{x : x_{\tau(\alpha)}\}$
- For any assignment g and any non-F-marked branching node α dominating β and γ such that $[\![\beta]\!]^g([\![\gamma]\!]^g)$ is defined, $\langle\!\langle\alpha\rangle\!\rangle^g = \{b(c) : b \in \langle\!\langle\beta\rangle\!\rangle^g \wedge c \in \langle\!\langle\gamma\rangle\!\rangle^g\}$

F-marked things *introduce* alternatives; pointwise functional application *percolates* them. $\langle\!\langle\alpha\rangle\!\rangle^g$'s members "vary on" α's foci.

Three empirical pieces (3/8)

Derives a regular sloppy reading:

(3) $[_{IP_A}$ Simon $[_A\, \lambda_x\ t_x$ thinks he$_x$'s smart$]]$
$[_{IP_E}$ CHRIS_F does $[_E\, \lambda_y\ t_y$ thinks he$_y$'s smart$]$ (TOO)$]$

Both Identity and Contrast satisfied:

- A and E are identical up to indices. ✓
- $IP_A \sim IP_E$: $[\![IP_A]\!]^g \in \langle\!\langle IP_E \rangle\!\rangle^g = \{x \text{ thinks } x \text{ is smart} : x_e\}$. ✓

Three empirical pieces (4/8)

But **fails for surprisingly sloppy cases**:

(1) $[_{IP_A}$ the cop who arrested Jon$_i$ $[_A$ INSULTED$_{\mathrm{F}}$ him$_i]]$
$[_{IP_E}$ the cop who arrested BILL$_{j,\mathrm{F}}$ DIDN'T$_{\mathrm{F}}$ $[_E$ *insult him$_j$*$]]$

(2) $[_{IP_A}$ if Jon has to cook he doesn't $[_A$ WANT$_{\mathrm{F}}$ to *cook*$]$
$[_{IP_E}$ if he has to CLEAN$_{\mathrm{F}}$ he doesn't $[_E$ *want to clean*$]]$

Though A/E identical-up-to-indices in (1), not so in (2). ✗

In (1)(2), the sloppy item is neither syntactically bound (coindexed w/a c-commanding operator, cf. Reinhart 1983) nor in focus.

- This means its denotation stays *constant* across $\langle\!\langle IP_E \rangle\!\rangle^g$.
- So, respectively, the focus sets contain propositions of the form "f(the cop who arrested x insult **Bill**)" and "if Jon has to Q, he doesn't want to **clean**".
- Contrast is wrongly predicted unsatisfiable in both cases. ✗✗

Three empirical pieces (5/8)

#2: Surprising covariation in association with focus

Sentence (4) has a **covarying** reading on which Bill is the only x_e s.t. I heard the cop who arrested x insulted x (Tomioka 1999).

(4) I only heard that [$_{IP}$ the cop who arrested BILL insulted him]!

(5) $[\![\text{only } VP]\!]^g = \lambda x : [\![VP]\!]^g(x).\, \forall P \in \langle\!\langle VP \rangle\!\rangle^g.\, P(x) \rightarrow P = [\![VP]\!]^g$

A standard semantics for *only* (cf. 5) entails that this reading is due to $\langle\!\langle IP \rangle\!\rangle^g = \{\text{the cop who arrested } x \text{ insulted } x : x_e\}$.

- But **whence a covarying focus set**? Again, it appears that the focused item doesn't bind the (unfocused) pronoun.
- So: same problem as before.

Three empirical pieces (6/8)

Similar facts hold in the VP domain.[1] (6) has a covarying reading such that $[\![\text{clean}]\!]^g$ is the only Q_{et} such that if Jon has to Q he doesn't want to Q (cf. Kratzer 1991 for related observations).

(6) I only heard that [$_{IP}$ if Jon has to CLEAN, he doesn't want to]!

This means $\langle\!\langle IP \rangle\!\rangle^g = \{\text{if Jon has to } Q \text{ he doesn't want to } Q : Q_{et}\}$.

- Again, basically the same issue as surprising sloppy readings.
- In other words, surprising covariation in association with focus means *Contrast must be satisfiable in surprising sloppy cases*.

[1] Actually, similar facts hold for *arbitrary* XPs, but I'll stick to VPs in the talk.

Three empirical pieces (7/8)

#3: Donkey readings with disjunction

Example (7) can mean Mary waves to whomever in $\{$Bill, Sam$\}$ she meets (Stone 1992).

(7) If Mary meets Bill or greets Sam, she WAVES to him.

Note that (though the proper names aren't directly disjoined, cf. Stone 1992), this is just a case of donkey anaphora: an individual is nondeterministically introduced and grabbed later.

Three empirical pieces (8/8)

Again, the phenomenon cuts across categories.

- Both (8) and (9) can mean *Sue does whatever Mary does*.
- That is, if Mary cooks, Sue cooks, and if Mary cleans, Sue cleans. If Mary waves to Jon, Sue waves to Jon. And so on. (Rooth & Partee 1982; Stone 1992; Fiengo & May 1994).

(8) If Mary cooks or cleans, SUE does too.

(9) If Mary waves to Jon or Bill, SUE does too.

By analogy with the last slide, we must be nondeterministically introducing a *property* which gets grabbed downstream.

- But this means the grabber, like the donkey pronoun in (7), doesn't mean the same thing in all contexts of evaluation—it must be some sort of variable.
- And how is Contrast met in (8) and (9), anyway?

Preview of conclusions

Part 1: **Surprising sloppy/covarying items are donkey-bound**.

- Since surprising sloppy things include categories besides DP, we need a *cross-categorial* notion of donkey binding.
- This means *any XP* can dynamically extend its scope.

Part 2: **This donkey binding must be paired with a two-part focus-based theory of "ellipsis"** (Rooth 1992a; Bos 1994).

- This requires a compositionally-integrated, dynamically-anaphoric contrast operator $\sim_n$, essentially a dynamic revision of Rooth's (1992b) contrast operator $\sim$.

In the end, the theory assigns e.g. (2) an LF like (10).

(10) [If Jon^1 [has to cook$^{\uparrow 2}$]$^{\uparrow 3}$ he$_1$ doesnt $[[_A\,\textsc{want}_{\mathrm{F}}$ to $P_2] \sim_3]]^{\uparrow 4}$
$[[$If he$_1$ has to $(\textsc{clean}_{\mathrm{F}})^{\uparrow 5}$ he not $[_E$ *want to* $P_5]] \sim_4]$

A dynamic account

A dynamic account (1/7)

The framework is Muskens' (1996) CDRT plus **higher-order dynamic binding** (Hardt 1999; Stone & Hardt 1999).

The underlying system in Muskens (1996) is a classical type logic with three primitive types: e, t, s ('states'/assignments).

I'll provide the semantic details, but for the purposes of this talk, you'll lose little just paying attention to the DRT boxes.

A dynamic account (2/7)

DRT Conditions to type-logic formulae ('$\rightsquigarrow$' = 'abbreviates'; '$\vec{x}$' is a possibly empty sequence of arguements):

- $R_{\tau_1 \to \ldots \to \tau_n \to t}(\alpha_{s \to \tau_1}) \ldots (\Omega_{s \to \tau_n}) \rightsquigarrow \lambda i.\, R(\alpha(i)) \ldots (\Omega(i))$
- $K \Rightarrow K' \rightsquigarrow \lambda i.\, \forall j.\, K(i)(j) \to \exists k.\, K'(j)(k)$
- $\neg K \rightsquigarrow \lambda i.\, \neg \exists j.\, K(i)(j)$
- $\alpha = \beta \rightsquigarrow \lambda i.\, (\lambda \vec{x}.\, \alpha(\vec{x})(i) = \lambda \vec{x}.\, \beta(\vec{x})(i))$

Box interpretation:

- $[u_1 \ldots u_n \,|\, \gamma_1, \ldots, \gamma_n] \rightsquigarrow \lambda ij.\, i[u_1, \ldots, u_n]j \wedge \gamma_1(j) \wedge \ldots \wedge \gamma_n(j)$
- $i[u_1, \ldots, u_n]j$ iff i and j differ at most on $1, \ldots, n$.

Boxes abbreviate DPL-style **relations on states** (i.e. **programs**).

- So the propositional type is the type of boxes ($s \to s \to t$), and predicates are functions into propositions.

A dynamic account (3/7)

Box sequencing (relational composition):

- $K\,;\,K' \rightsquigarrow \lambda ij.\,\exists k.\,K(i)(k) \wedge K'(k)(j)$

Merging lemma (ML) (Muskens 1996: 150):

- If $\nu'_1, \ldots, \nu'_m$ do not occur free in any of $\kappa_1, \ldots, \kappa_l$:
  $[\nu_1 \ldots \nu_k \,|\, \kappa_1, \ldots, \kappa_l]\,;\,[\nu'_1 \ldots \nu'_m \,|\, \kappa'_1, \ldots, \kappa'_n] =$
  $[\nu_1 \ldots \nu_k\ \nu'_1 \ldots \nu'_m \,|\, \kappa_1, \ldots, \kappa_l, \kappa'_1, \ldots, \kappa'_n]$

Truth and entailment:

- K entails K' at i ('$K \vDash_i K'$') iff if K is true at i, K' is true at i.
- K is *true* at i ('$\vDash_i K$') iff $\forall i \exists j.\,K(i)(j)$.

So far, this is just Muskens (1996). Now for three additional pieces.

A dynamic account (4/7)

#1: Variable dynamic properties

DRT boxes parametrized not only to the usual arguments, but to *incoming states*, as well (Hardt 1999; Stone & Hardt 1999).

- For any ν_n of type $s \to \tau_1 \to \ldots \to \tau_m \to s \to s \to t$, and for any sequence $\vec{x}$ of length m: $\nu_n(\vec{x}) := \lambda ij.\nu_n(i)(\vec{x})(i)(j)$.

This buys higher-order dynamic binding; we now have variables ranging over arbitrary functions into boxes.

A dynamic account (5/7)

#2: A dynamicizing type-shifter

The ${}^{\uparrow n}$ type-shifter exploits variable dynamic properties, allowing arbitrary constituents to type-shift into dynamic binders.

(11) $[\![\alpha^{\uparrow n}]\!] = \lambda \vec{x}.\, [\nu_n \,|\, \nu_n = [\![\alpha]\!]]; \nu_n(\vec{x})$

Modulo binding, $[\![\alpha^{\uparrow n}]\!]$ behaves exactly the same as $[\![\alpha]\!]$. In other words, ${}^{\uparrow n}$ is a dynamicizing identity function.

A dynamic account (6/7)

#3: Externally dynamic disjunction

Motivated by the disjunctive donkey cases. Allows disjunctions, like indefinites, to introduce nondeterminism with respect to the values of variables in their semantic scope.

Box disjunction (relational union):

- $K \sqcup K' \rightsquigarrow \lambda ij.\, K(i)(j) \vee K'(i)(j)$

An instance of generalized disjunction (Partee & Rooth 1983).

A dynamic account (7/7)

Here is a small **lexicon**:

Expression(s)	Translation	Type
man	$\lambda v.\, [\,\vert\, \mathrm{man}(v)]$	$\mathtt{et}$
met	$\lambda \kappa v.\, \kappa(\lambda v'.\, [\,\vert\, \mathrm{met}(v')(v)])$	$\mathtt{((et)t)et}$
a^n	$\lambda PQ.\, [u_n \,\vert\,]; P(u_n); Q(u_n)$	$\mathtt{(et)(et)t}$
the_n	$\lambda PQ.\, P(u_n); Q(u_n)$	$\mathtt{(et)(et)t}$
Jon^n	$\lambda P.\, [u_n \,\vert\, u_n = \mathrm{Jon}]; P(u_n)$	$\mathtt{(et)t}$
he_n, t_n	$\lambda P.\, P(u_n)$	$\mathtt{(et)t}$
$\lambda_n\, \alpha$	$\lambda u_n.\, [\![\mathrm{X}]\!]$	$\mathtt{e}(\tau(\mathrm{X}))$
if, when	$\lambda pq.\, [\,\vert\, p \Rightarrow q]$	$\mathtt{ttt}$
and, C_0, ;	$\lambda fg\vec{x}.\, f(\vec{x}); g(\vec{x})$	$\tau_{\mathtt{t}}\tau_{\mathtt{t}}\tau_{\mathtt{t}}$
or	$\lambda fg\vec{x}.\, f(\vec{x}) \sqcup g(\vec{x})$	$\tau_{\mathtt{t}}\tau_{\mathtt{t}}\tau_{\mathtt{t}}$
want to	$\lambda P.\, \mathbf{want}(P)$	$\mathtt{(et)et}$
doesn't	$\lambda Pv.\, [\,\vert\, \neg P(v)]$	$\mathtt{(et)et}$

Conventions: $\mathtt{e} := s \to e$, and $\mathtt{t} := s \to s \to t$. Types associate to the right: $\tau_1\tau_2\tau_3 := \tau_1(\tau_2\tau_3)$. $\tau_{\mathtt{t}}$ is some type ending in $\mathtt{t}$.

Adding ellipsis (1/2)

Syntactic conditions: I assume with Schwarz (2000) that there are two ways for some E with lexical content to be phonologically non-prominent—i.e. null (or deaccented)

- The first ('Deletion') is familiar: E has an antecedent A with which it's syntactically identical up to indices and F-marks.
- The second ('Binding') applies when E is a phonologically null or deaccented pro-XP *semantically bound by A*.

Ellipses with structure motivated by/possibility of, constraints on stuff moving out of ellipses (Ross 1967; Merchant 2000). Bound pro-forms motivated by the stuff in the first section of the talk.

Purely semantic licensing seem to have problems (Chung 2005).

Contrast should apply to both Deletion and Binding. Will return.

Adding ellipsis (2/2)

This suggests the following baby-LFs:

(12) $[_{S_A}$ the$_0$ cop who arrested Jon^1 $[_A$ insulted him$_1]]$
$[_{S_E}$ the$_2$ cop who arrested BILL^3_F DIDN'T_F $[_E$ *insult* $\underline{\textit{him}_3}]]$

(13) $[_{S_A}$ if Jon^1 has-to cook$^{\uparrow 3}$ he$_1$ doesn't $[_A$ WANT_F-to $P_3]]$
$[_{S_E}$ if he$_1$ has-to $\text{CLEAN}^{\uparrow 4}_\text{F}$ he doesn't $[_E$ *want-to* $\underline{P_4}]]$

We haven't added alternative semantics or Contrast yet, but Identity is obviously satisfied, and the meanings are correct. ✓

(14) $[\, u_1 \mid u_1 = \text{Jon}, \text{cop}(u_0), \text{arrested}(u_1)(u_0), \text{insulted}(u_1)(u_0)\,]$
$[\, u_3 \mid u_3 = \text{Bill}, \text{cop}(u_2), \text{arrested}(u_3)(u_2), \neg[\, \mid \text{insulted}(u_3)(u_2)\,]]$

(15) $[\, \mid ([\, u_1\ P_3 \mid u_1 = \text{Jon}, P_3 = [\![\text{cook}]\!]]; P_3(u_1)) \Rightarrow [\, \mid \neg \textbf{want}(P_3)(u_1)]]$
$[\, \mid ([\, P_4 \mid P_4 = [\![\text{clean}]\!]]; P_4(u_1)) \Rightarrow [\, \mid \neg \textbf{want}(P_4)(u_1)]]$

Note: $[\![\text{has-to}]\!]$ is vacuous. Constant-y drefs need to be accessible when introduced in the scope of tests (Asher 1993; Hardt 1999). Remediable in a more sophisticated system (Stone & Hardt 1999).

Adding Contrast (1/3)

Two plausible properties for Contrast to have:

$\#1$: Stuff dominating a dynamic binder α must be able to contrast with stuff being bound by α.

- For instance, Contrast has to license both the silent pro-VP in (16) and the silent (*a fortiori*, deaccented) pronoun in (17).
- Presumably this is because *has to cook*$^{\uparrow 3} \sim \textsc{want}_{\text{F}}$-*to* P_3, and a^1 *man entered* $\sim he_1\ \textsc{sat}_{\text{F}}$:

(16) $[_{S_A}$ if Jon^1 has-to cook$^{\uparrow 3}$ he$_1$ doesn't $[_A\ \textsc{want}_{\text{F}}$-to $P_3]]$

(17) A^1 man entered. He$_1$ $\textsc{sat}_{\text{F}}$.

$\#2$: Context-change-potential differences between $a = [\![XP_A]\!]$ and the relevant $e \in \langle\!\langle XP_E \rangle\!\rangle$ should be ignored. So $a \vDash e$, not $a = e$.

(18) John $[_A$ met a^1 man$]]$. $\textsc{bill}_{\text{F}}$ did $[_E$ meet a^2 man$]$ too

Adding Contrast (2/3)

(19) $[\![\alpha \sim_n]\!] = \lambda \vec{x} ij : \exists a \in \langle\!\langle \alpha \rangle\!\rangle.\, v_n \vDash_i a.\, [\![\alpha]\!](\vec{x})(i)(j)$
Generalized entailment: $f \vDash_i g$ iff $\forall \vec{x}.\, f(\vec{x}) \vDash_i g(\vec{x})$

The Contrast operator $\sim_n$ is dynamically bound (generally by something that's shifted via ${}^{\uparrow n}$).

Informally, $[\![\alpha \sim_n]\!]$ **presupposes** (':') that n denotes something that **statically entails** some member $\langle\!\langle \alpha \rangle\!\rangle$.

Adding Contrast (3/3)

How this works for a basic case:

(17′) $[\mathsf{a}^1 \text{ man entered}]^{\uparrow 0}$; $[[\mathsf{he}_1\ \textsc{sat}_{\mathrm{F}}] \sim_0]$

Informally, $\sim_0$ presupposes that $[\![\mathsf{a}^1 \text{ man entered}]\!]$ entails some member of $\langle\!\langle \mathsf{he}_1\ \mathsf{sat}_{\mathrm{F}} \rangle\!\rangle$.

Since $[\![\mathsf{he}_1 \text{ entered}]\!] \in \langle\!\langle \mathsf{he}_1\ \mathsf{sat}_{\mathrm{F}} \rangle\!\rangle$, at any *i* output by the first conjunct, $[\![\mathsf{a}^1 \text{ man entered}]\!] \vDash_i [\![\mathsf{he}_1 \text{ entered}]\!]$. ✓

Extending this to surprising sloppy readings

A grown-up LF for a surprisingly sloppy case:

(13′) $[_{S_A}$ if Jon^1 [has-to cook$^{\uparrow 3}]^{\uparrow 7}$ he$_1$ doesn't $[[_A\ \textsc{want}_{\mathrm{F}}$-to $P_3]\ \sim_7]]^{\uparrow 8}$
$[[_{S_E}$ if he$_1$ has-to $\textsc{clean}_{\mathrm{F}}^{\uparrow 4}$ he doesn't $[_E$ *want-to* $\underline{P_4}]]\ \sim_8]$

Assuming definedness, the meanings are as before.

New: two **presuppositions** are triggered by ~'s:

- #1: That $[\![$has-to cook$^{\uparrow 3}]\!]$ entails some $a \in \langle\!\langle \textsc{want}_{\mathrm{F}}$-to $P_3 \rangle\!\rangle$ (in the latter's context of evaluation).
- #2: That $[\![S_A]\!]$ entails some $a \in \langle\!\langle S_E \rangle\!\rangle$.

Here *cook*$^{\uparrow 3}$ binds P_3. If $[\![$has-to$]\!] \in \langle\!\langle \textsc{want}_{\mathrm{F}}$-to$\rangle\!\rangle$, #1 holds. ✓

$\langle\!\langle S_E \rangle\!\rangle = \{$if he$_1$ has to $Q^{\uparrow 4}$ he doesn't want to $Q^{\uparrow 4} : Q_{\mathtt{et}}\}$.

- Next: $[\![cook]\!] \in \langle\!\langle \textsc{clean}_{\mathrm{F}} \rangle\!\rangle$, $[\![S_A]\!]$ entails the corresponding $a \in \langle\!\langle S_E \rangle\!\rangle$. So #2 holds, as well. ✓
- Note also how this buys the **association with focus** facts.

Donkey VPs, donkey Contrast

Following informal discussion in Stone (1992):

(20) if [[Jon or Bill] λ_4 [Mary [waves t_4]$^{\uparrow 3}$]$^{\uparrow 6}$] [[$\textsc{sue}_{\mathrm{F}}$ does P_3 (too)] $\sim_6$]

(21) $[\![$[Jon or Bill] λ_4 [Mary [waves t_4]$^{\uparrow 3}$]$^{\uparrow 6}]\!]$ =
$([S_6 \mid S_6 = [P_3 \mid P_3 = \lambda v.[\,\mid \text{waves}(\text{jon})(v)]]; P_3(\text{mary})]; S_6) \sqcup$
$([S_6 \mid S_6 = [P_3 \mid P_3 = \lambda v.[\,\mid \text{waves}(\text{bill})(v)]]; P_3(\text{mary})]; S_6)$

Dynamic disjunction means that, depending on the state, P_3 is either $[\![$waves to Jon$]\!]$ or $[\![$waves to Bill$]\!]$.

The dref P_3 lives inside the dynamic box S_6, which itself varies across states output by the antecedent.

So binding of the contrast operator $\sim_6$ here is donkey anaphora-ish: it requires, essentially, that *Mary waves to John* contrasts with $\textsc{sue}_{\mathrm{F}}$ *waves to John*, **and** that *Mary waves to Bill* contrasts with $\textsc{sue}_{\mathrm{F}}$ *waves to Bill*. ✓✓

Note the necessity of wide-scoping disjunction (Stone 1992).

Comparing with other accounts

Each of the three empirical pieces has been discussed in the literature. But nobody groups them all together, so everyone ends up with an incomplete picture.

Schwarz (2000)

Schwarz (2000) argues that surprising sloppy readings result from bonafide **syntactic binding** of VP-internal pro-forms via QR of the binder to a c-commanding position at LF (cf. 22).

- Relies on otherwise-unmotivated long-distance QR of phrases not subject to overt movement.
- Wide-scoping doesn't give you donkey-binding.
- Struggles with extraction cases (see the paper for details).

(22) cook $[\lambda_1$ when Jon has to t_1 he doesn't $[_A$ want to $P_1]]$
clean$_{\mathrm{F}}$ $[\lambda_1$ when Jon has to t_2 he doesn't $[_E$ want to $P_2]]$

Hardt (1999) (1/3)

Hardt (1999) gives dynamic account. Has some things in common with the theory here, as well as some important differences.

- No Identity or Contrast; instead requires **perfect semantic identity** of A and E since A dynamically binds E.
- This is achieved with a dedicated **center index** '$*$' which can be overwritten/downdated (cf. 23).

(23) when Jon^1 has to cook* he doesn't $[_A$ want to $Q_*]^2$
when he$_1$ has to clean* he doesn't $[_E\ Q_2]$

Hardt (1999) (2/3)

Some problems:

- Missing a dynamic disjunction.
- Elided VPs are invariably structureless pro-forms. Again unclear how to extract out of elliptical VPs.
- There can be more than surprisingly sloppy thing in a clause (cf. Sauerland's (2007) *when a woman buys a blouse, we ask that she try it on, but when a man buys a shirt, we don't*). Relying on destructive update means Hardt needs an infinity of over-writable indices $*_1, *_2, \ldots$ for each type.

Hardt (1999) (3/3)

Lack of focus integration leads to over-generation:

- (24) lacks a strict < sloppy reading (= Bill likes Jon's mom, and Sam likes Sam's mom) (Fiengo & May 1994).
- (25) just lacks a sloppy reading (Bos 1994).
- But Hardt's account generates those LFs straightaway.

(24) Jon* [likes his$_*$ mom];[2] Bill doesn't Q_2. Sam* does Q_2.

(25) Jon*'s mom [likes him$_*$]^3; Steve* does Q_3 too.

These facts fall out of a focus-based account:

- In both cases, the sloppy sentence's focus set is (roughly) $\{x$ likes x's mom : $x_e\}$. If Contrast has to relate the sloppy sentence with the *immediately* preceding sentence (Hardt & Romero 2004), its presuppositions can in neither case be met (both preceding sentences express "mixed" propositions).[2]

[2] Also a problem for Elbourne (2008); Merchant (2009)!

Conclusions

- **Cross-categorial dynamic anaphora** explains surprising sloppy readings, surprising covarying association with focus, and donkey-VP-anaphora.
- Integrating the semantics with a **focus-based theory of ellipsis licensing** à la Rooth (1992a) is an important part of the story (as is dynamic disjunction).
- This was cashed out with a compositionally interpreted, dynamically bound version of Rooth's $\sim$, which immediately extends to "donkey-anaphoric Contrast" cases like (20).

Thanks!

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