Compositional licensing of silent structure

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CUNY Syntax Supper · October 13, 2015

Overview

- Standard theories of ellipsis require some sort of **identity** relationship between an elided XP and its antecedent.
- Two prominent criticisms:
  - Inherent **non-compositionality**.
  - Identity seems to draw the wrong boundaries, in particular w.r.t. the range of construals possible for **elided pronouns**.
- This talk:
  - **Compositionality is within reach** if we take the anaphoric character of ellipsis seriously.
  - Obstacles to purely identity-based theories are **only apparent**, given independently motivated machinery.
- Main contribution: helping to clarify the dialectic. Problems will remain.

Where we are

Identity-based theories of ellipsis

Objections to identity

New theory

Discussion

Ellipsis

- Ellipsis: non-pronunciation of some XP_E, "in virtue of" the presence of some other XP_A in the discourse.

  (1) John $\underbrace{\text{ate the burger}}_{VP_A}$ because MARY COULDN'T $\underbrace{(\text{eat the burger})}_{VP_E}$.

- CAPS indicates intonational prominence (i.e., roughly, focus). Turns out to be important. We'll circle back later.

$XP_A \overset{?}{\sim} XP_E$

- What is the relationship between XP_A and XP_E? According to Sag (1976); Williams (1977): **identity**.
- For example, ambiguity doesn't multiply in ellipsis:

(2) **Structural:**
Sue $\underbrace{\text{likes flying kites}}_{VP_A}$, and JOHN does $\underbrace{\text{(like flying kites)}}_{VP_E}$, TOO.

(3) **Pronominal:**
John $\underbrace{\text{likes her}}_{VP_A}$, but MARY DOESN'T $\underbrace{\text{(like her)}}_{VP_E}$.

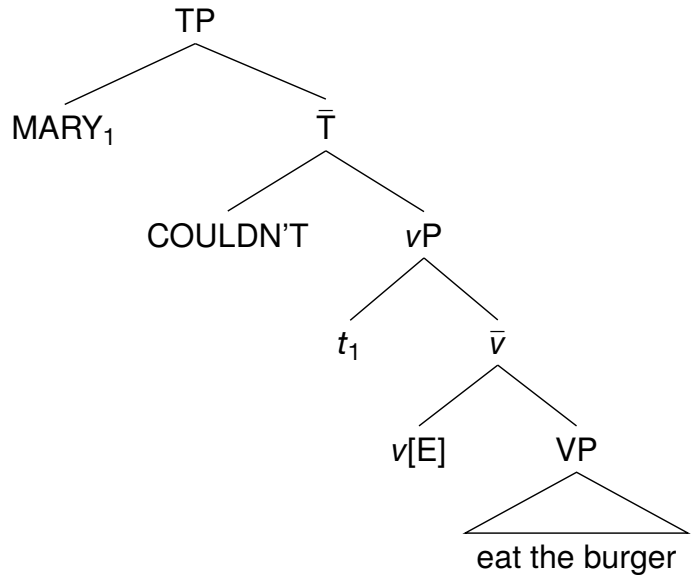
(4) **Scope:**
Al $\underbrace{\text{gave a toy to everyone}}_{VP_A}$ after BO did $\underbrace{\text{(give a toy to everyone)}}_{VP_E}$.

Kinds of identity

- Identity of **phrase markers** (whether surface structure or LF): e.g., Sag (1976); Williams (1977); Rooth (1992a); Fiengo & May (1994); Chung et al. (1995); …
- Identity of **meaning**: e.g., Keenan (1971); Szabolcsi (1992); Jacobson (1992); Hardt (1993, 1999); Merchant (2001); Barker (2013); …

E-theory

- Following Merchant (2001), we'll assume a semantic identity theory.
- Roughly: an [E] feature on *v* silences *v*'s sister:



- To enforce licensing, *v*[E] denotes a **partial identity function**:

$$[\![v[\text{E}]]\!]^g = \lambda P. \begin{cases} P \text{ if } P \text{ is E-given} \\ \text{undefined otherwise} \end{cases}$$

- Roughly: *P* is E-given iff sthg in the discourse means the same thing. □

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Un-compositionality

- Jacobson (to appear) argues that identity-based theories cannot be compositionally formalized.
- Whether a potentially elidable XP has an identical antecedent somewhere in the discourse isn't a local property of that XP.
- Concretely, repeating the semantics of *v*[E]:

$$[\![v[\mathrm{E}]]\!]^g = \lambda P. \begin{cases} P \text{ if } P \text{ is E-given} \\ \text{undefined otherwise} \end{cases}$$

- Whether *P* is E-given can't be known on the basis of its meaning or the meaning of *v*[E]. Ergo, non-compositional.

Meaningless co-indexing

- LFs with meaningless (i.e. spurious) co-indexing seem disastrous for identity-based theories (Heim 1997):

  (5) Al $\underbrace{\text{saw his}_1\ \text{mom}}_{\text{VP}_A}$ before BO [λ_1 t_1 did v[E] ($\underbrace{\text{see his}_1\ \text{mom}}_{\text{VP}_E}$)].

- Here, the VPs have the same form and meaning. Identity is satisfied.
- However, the first *his*$_1$ is free, and the second is bound. That means if $g(1) = \textsc{sam}$, the following should be a possible meaning for (5):

  (6) Al saw Sam's mom before Bo saw Bo's mom.

- … But it isn't.

No meaningless coindexing?

- Heim (1997) argues that identity-based theories must be supplemented with a prohibition on “meaningless” (i.e., semantically inert) co-indexing:

(5) *Al $\underbrace{\text{saw his}_1\text{ mom}}_{\text{VP}_A}$ before BO λ_1 t_1 did v[E] ($\underbrace{\text{see his}_1\text{ mom}}_{\text{VP}_E}$).

Sloppy ellipsis

- In **sloppy** ellipsis, the interpretation of a pronoun seems to vary between XP_A and XP_E:

  (7) Al_i $\underbrace{\text{likes his}_i \text{ mom}}_{\text{VP}_A}$, but BO_j DOESN'T $\underbrace{(\text{like his}_j \text{ mom})}_{\text{VP}_E}$.

- Standard approach (Keenan 1971; Sag 1976; Williams 1977): **binding** facilitates an identity relationship between VP_A and VP_E.

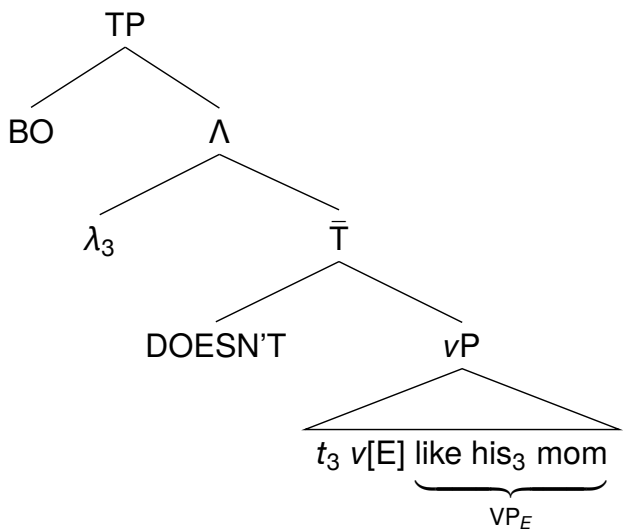
$$[\![\text{VP}_A]\!]^g = [\![\text{VP}_E]\!]^g = \lambda x.\ \textsc{likes}\ (x, x\text{'s}\ \textsc{mom})$$

Problem: sloppy ellipsis with 'rebinding'

- But not always possible to bind sloppy pronouns inside of VP_E:

  (8) Al λ_2 t_2 says I $\underbrace{\text{like him}_2}_{VP_A}$. BO λ_3 t_3 says I DON'T v[E] $\underbrace{(\text{like him}_3)}_{VP_E}$.

- 'No meaningless co-indexing' forces contra-indexing of *him*$_2$ and *him*$_3$. But then **how can identity be satisfied**?
- In fact, given standard *v*P cartographies, **all** sloppy ellipsis is rebinding. E.g., for *Al*$_i$ *likes his*$_i$ *mom, but BO*$_j$ *DOESN'T (likes his*$_j$ *mom)*:



Rooth (1992a)

- Responding to similar concerns, Rooth (1992a) suggests that pure identity **cannot** be what underlies ellipsis.
- Instead, he proposes a **limited form of syntactic identity** (specifically, up to variable names), paired with a condition on discourse coherence.
  - Contra Merchant, inherently syntactic
  - Contra Jacobson, inherently noncompositional

Summing up

- Obstacles for identity-based theories:
  - Non-compositionality looks baked in.
  - ‘Meaningless’ co-indexing cases suggest that merely requiring some form of identity is too permissive.
  - However, forbidding ‘meaningless’ co-indexing seems too restrictive.

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Compositionalizing the E-feature

- The compositionality worry is dissolved if we take the anaphoric character of ellipsis more seriously:

$$[\![v[\mathrm{E}_i]]\!]^g = \lambda P.\begin{cases} P(g) \text{ if } g(i) = P \\ \text{undefined otherwise} \end{cases}$$

  Identity cashed out as **anaphora**: the assignment g must record the presence of an ancedent for $v[\mathrm{E}_i]$'s sister, on pain of undefinedness.

- Cf. Rooth's (1992b) related proposal for focus interpretation ($\sim_i$).
- Natural to think of g **dynamically**, i.e. as a record of discourse referents directly introduced **by linguistic material** (cf. Hankamer & Sag 1976).
  - But we'll keep the dynamic machinery in the background here.

Composition

$$[\![v[\mathrm{E}_i]]\!]^g = \lambda P.\begin{cases} P(g) \text{ if } g(i) = P \\ \text{undefined otherwise} \end{cases}$$

- Notice that $v[\mathrm{E}_i]$ presupposes that its argument is a function **from assignments** into values. Requires **intensional functional application** (Kennedy 2014; Heim & Kratzer 1998: 308):

$$[\![\alpha\ \beta]\!]^g = [\![\alpha]\!]^g\,([\![\beta]\!]^h), \text{ when defined}$$

Example

- Handling a basic case:

  (9) John [ate the burger]$_8$ because I COULDN'T v[E$_8$] eat the burger.

- If $g(8) = \lambda h.\, [\![\text{eat the burger}]\!]^h = \lambda h.\, \lambda x.\, \textsc{eat}\,(x, \textsc{the-burger})$, the demands of v[E$_8$] are satisfied, and ellipsis is licensed.
- NB: though licensing has an anaphoric **component**, the ellipsis site remains **syntactically represented**.

Same-indexing

- Here is another example, this time with some pronouns:

  (10) Mary [likes him_2]$_4$, but SUE DOESN'T v[E_4] ($\underbrace{\text{like him}_2}_{\text{VP}_E}$).

- Assuming $g(4) = \lambda h.\, [\![\text{like him}_2]\!]^h = \lambda h.\, \lambda x.\, \textsc{like}\,(x, h(2))$, v[E_4] is satisfied, and ellipsis is licensed.
- Contra Rooth 1992a, E_i requires *identical* indices in VP_A and VP_E.
  - … i.e., **perfect** identity

Same-indexing (cont.)

- If there's a pronoun in VP_A, it must bear the same index in VP_E.
- We saw this make trouble before. Does it make trouble now?
- I think not.
  - First, we'll see why 'meaningless' co-indexing shouldn't trouble us.
  - Second, we'll see how to build a general account of sloppy readings.

Givenness and 'meaningless' co-indexing

- Circling back to the problematic example from before:

  (5) Al [saw his$_1$ mom]$_9$ before BO λ_1 t_1 did v[E$_9$] (see his$_1$ mom).

- Impossible reading: $g(1)$ = sam.
  - But so far as v[E$_9$] is concerned, nothing is amiss.

GIVENNESS and 'meaningless' co-indexing (cont.)

- Schwarzschild's (1999) GIVENNESS requires that replacing the stressed things in TP_b can get you to an LF with the same meaning as TP_a.[1]

  (11) *[$_{TP_a}$ Mary ate the cracker], and then [$_{TP_b}$ BILL *ate the ramen*].

  (12) [$_{TP_a}$ Mary ate the cracker], and then [$_{TP_b}$ BILL *ate the* RAMEN].

- GIVENNESS is **impossible to satisfy** in the problematic cases:

  (13) Al [saw his$_1$ mom]$_9$ before BO λ_1 t_1 did v[E$_9$] (see his$_1$ mom).

- Relacing *BO* with Al yields a sentence meaning that Al saw **Al's** mom, rather different from Al seeing $g(1)$ = SAM's mom.

[1] Like the E-feature, GIVENNESS can be compositionalized. See Charlow (2015).

Back to sloppiness

- So, that's nice. Maybe we can just chalk up sloppy readings to rampant co-indexing after all:

  (14) Al λ_2 t_2 says I [like him$_2$]$_9$.
  BO λ_2 t_2 says I DON'T v[E$_9$] (like him$_2$).

- Represents the sloppy reading, predicted grammatical:
  - v[E$_9$] is happy: $g(9) = \lambda h.\, [\![\text{like him}_2]\!]^h = \lambda h.\, \lambda x.\, \textsc{like}\,(x, g(2))$
  - Givenness satisfied: replacing *BO* with *Al* and *DON'T* with *do* yields something semantically equivalent to the first sentence.

Under-generation

- However, there's a problem of under-generation lurking. *A linguist thinks he's smart, and a PHILOSOPHER does TOO* has a sloppy reading.
- Here's how we'd have to represent that reading:

(15) A linguist λ_6 t_6 [thinks he$_6$'s smart]$_7$.
A PHILOSOPHER λ_6 t_6 does v[E$_7$] (think he$_6$'s smart) TOO.

- In dynamic semantics, co-indexing has the effect of **over-writing** the previous index, wrongly predicting that sloppy anaphora for (15) is incompatible with downstream pronouns referring back to the linguist.

(16) … and he$_{\text{phil}}$ never lets him$_{\text{ling}}$ hear the end of it.

Assignment shuffling

- Independently motivated piece: the relative prominence of discourse referents can shift in the course of interpretation (e.g., Grosz et al. 1995; Hardt 1999; Bittner 2014; Stojnic et al. 2015).[2]
- Formally, we can represent this (however crudely) with an operator that swaps registers in ('**shuffles**') an assignment function:

$$[\![m{\leftrightarrow}n\ \alpha]\!]^g = [\![\alpha]\!]^{g[m \to g(n)][n \to g(m)]}$$

- Importantly, $m{\leftrightarrow}n$ encodes a **monotonic** operation on assignments. No information is lost; information is simply re-ranked.
- An example. Suppose $g(1) = \textsc{sam}$ and $g(3) = \textsc{bob}$. Then:

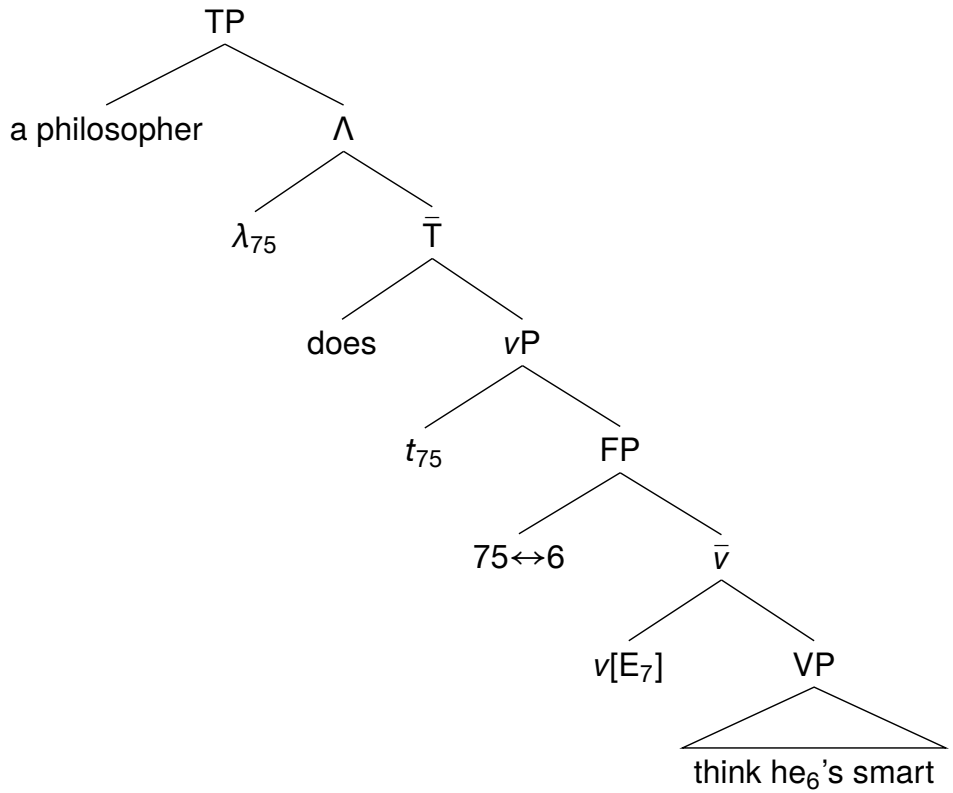
$$[\![\text{he}_1 \text{ saw him}_3]\!]^g = \textsc{saw}(\textsc{sam}, \textsc{bob})$$
$$[\![1{\leftrightarrow}3\ [\text{he}_1 \text{ saw him}_3]]\!]^g = \textsc{saw}(\textsc{bob}, \textsc{sam})$$

[2] See Stojnic et al. (2015) for arguments that such shifts are properly grammatical.

The full range of sloppy readings

- Accounting for our problematic case:

  (17) A linguist λ_6 t_6 [thinks he$_6$'s smart]$_7$.



- *v*[E$_7$] is happy, and 75↔6 guarantees that the elided *he*$_6$ denotes the philosopher. The sloppy reading is derived without losing any info.

More motivation for shuffling: a free paycheck

- Pronouns anaphoric to constituents with pronouns inside also display something like a sloppy reading:

  (18) John λ_1 t_1 saved [his$_1$ paycheck]$_3$, but BILL λ_2 t_2 SPENT it$_3$.

- Shuffling allows us to generate the 'sloppy' reading. Glossing over some details, if $[\![\text{it}_3]\!]^g = g(1)$'s paycheck, we'll have:

  (19) BILL λ_2 t_2 SPENT 2↔1 it$_3$

- Which adequately represents the 'sloppy' reading.

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A recalcitrant case: sloppy *VPs*!

- A new kind of example (cf. Schwarz 2000; Hardt 1999):

(20) When John has to cook, he doesn't $\overbrace{\text{want to (cook)}}^{\text{VP}_A}$.
When he has to CLEAN, he doesn't $\underbrace{\text{(want to clean)}}_{\text{VP}_E}$ EITHER.

- Problematic for any approach that syntactically represents ellipses. Easier to grapple with in properly anaphoric theories of ellipsis.
- My account, alas, has nothing to say. Though there is an anaphoric component to the theory, ellipsis sites remain syntactically represented.

Conclusion

- So that's my brief. If you'd like to theorize about ellipsis in terms of identity, I've tried to lay out a way that lets you help yourself to:
  - Direct compositionality
  - Strict identity without the pitfalls
- Some problems remain. The theory has anaphora to VPs without having *anaphoric* VPs.
  - This is a bit awkward
  - And it seems incompatible with the existence of sloppy VPs
- Perhaps a better theory has properly anaphoric VPs. But identity-based issues will crop up there as well (since anaphora entails identity of meaning). Given what I've argued above, they needn't trouble us.
- Thanks!

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