Semantic Ellipsis After All? Evidence from Focus and Higher-Order Boolean Antecedents.

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1. Introduction

(1)   I know what John ate for lunch, but
I don't know what$_2$ Bill did ~~eat e$_2$ for lunch~~.

There is a traditional question whether verb phrase ellipsis is syntactically structured in the ellipsis site ("ramified syntax"), or is semantic—there is some kind of variable or discourse referent in the ellipsis site. This talk takes the stance that the evidence for ramified syntax is very strong (Merchant, 2001; Kennedy, 2003). Nevertheless some evidence points in the semantic direction—literature on *covariant* or *bound variable* readings of ellipsis. Two kinds of examples in Schwarz (2001) Ch. 5, Silent verb phrases as bound variables.

> **A**   focused VP antecedent, and a covariant ellipsis VP

(2)   a. John cooked because he had to cook.   **A** Schwarz (2001) p. 156
b. And he CLEANed because he had to.
(= and he cleaned because he had to clean)
d. Focus alternative of the form
covariant   'John Q because he had to Q', rather than
invariant   'John Q because he had to clean'.

This is indicated by the focus antecedent a. having the covariant form, rather than the invariant form. It has 'cook' in both Q slots.

It's comparable to a covariant pronoun with a focused antecedent. There are examples of this form in Partee (1970), who analogizes such readings to bound variables. (The pronoun can be stressed, but the example under discussion has an unstressed pronoun.)

(3)   a. Ava thinks her solution is working.
b. And EMMA thinks her solution is working.
Antecedent of the form 'y thinks y's solution is working', not 'y thinks Emma's solution is working'.

Schwarz (2001) said that (2) has an LF with a bound property variable in the ellipsis site. The ellipsis site is not syntactically structured.

> **B**   ellipis rather than a pronoun is the embedded sloppy or covariant element, under another ellipsis

(4)   You're not very consistent.   **B**
When I sing, you ask me not to.
When I WHISTLE, you don't.
(= you don't ask me not to whistle).

It's comparable to a covariant reading (i.e. sloppy reading) for the individual type, with a focused type *e* antecedent embedded in an ellipsis antecedent.

(5)   a. When Ava asks you to help her, you try to help her.
b. When EMMA asks you to help her, you don't.
(= you don't try to help Emma)

Schwarz (2001) said that (4) has lambda-bound property variable in the lower ellipsis site.

2. Higher order Boolean antecedents

> **C**   Examples with (apparently) higher-order Boolean antecedents binding a property variable in the ellipsis site.

(6)   a. He's not exactly cooperative.
    b. But he either cooked or cleaned up without me asking him to. I forget which.   **C**
        (= Either he cooked without me asking him to cook, or he cleaned up without me asking him to clean up)

Higher order VP a la Rooth and Partee (1982), Partee and Rooth (1983):

(7)   Lower order Boolean interpretations of type *et*
    either cooked or cleaned up $\lambda x.\textbf{cook}(x) \vee \textbf{cleanup}(x)$
    both cooked and cleaned up $\lambda x.\textbf{cook}(x) \wedge \textbf{cleanup}(x)$

(8)   Higher order Boolean interpretations of type $((et)t)t$. $\mathscr{P}$ is a variable of type $(et)t$.
    either cooked or cleaned up $\lambda \mathscr{P}[\mathscr{P}(\textbf{cook}) \vee \mathscr{P}(\textbf{cleanup})]$
    both cooked and cleaned up $\lambda \mathscr{P}[\mathscr{P}(\textbf{cook}) \wedge \mathscr{P}(\textbf{cleanup})]$

R&P is concerned with disjunction (or). Such examples are possible with conjunction (and) as well.

(9)   a. Ted both graduated from college and retired before his older brother Bob did.   **C**
    b. Ted graduated from college before Bob graduated from college, and Ted retired before Bob retired.
    c. Ted both graduated from college and retired before Bob both graduated from college and retired.

Analysis with a bound property variable and a higher order quantifier:

(10)   Quantifier $\lambda \mathscr{P}[\mathscr{P}(\textbf{graduatefromcollege}) \wedge \mathscr{P}(\textbf{retire})]$
    Scope $[2_{set} [\text{Ted } e_{2,set} \text{ before his older brother Bob } e_{2,set}]]$
    Semantic gloss   Both $\lambda wx.\textbf{graduatefromcollege}(w,x)$ and
        $\lambda wx.\textbf{retire}(w,x)$ satisfy the scope property of properties.

Skip to (13), then skip back to Section 2

3. Ramified Syntax Architecture

(11)   **Syntax** Ellipsis sites have full, nearly standard, ramified syntactic derivations.
    Phonology A local feature E triggers null phonological realization.
    Local Syntax E is locally licensed, usually by specifiers.
    Compositional Semantics Ellipsis sites have standard compositional semantics.
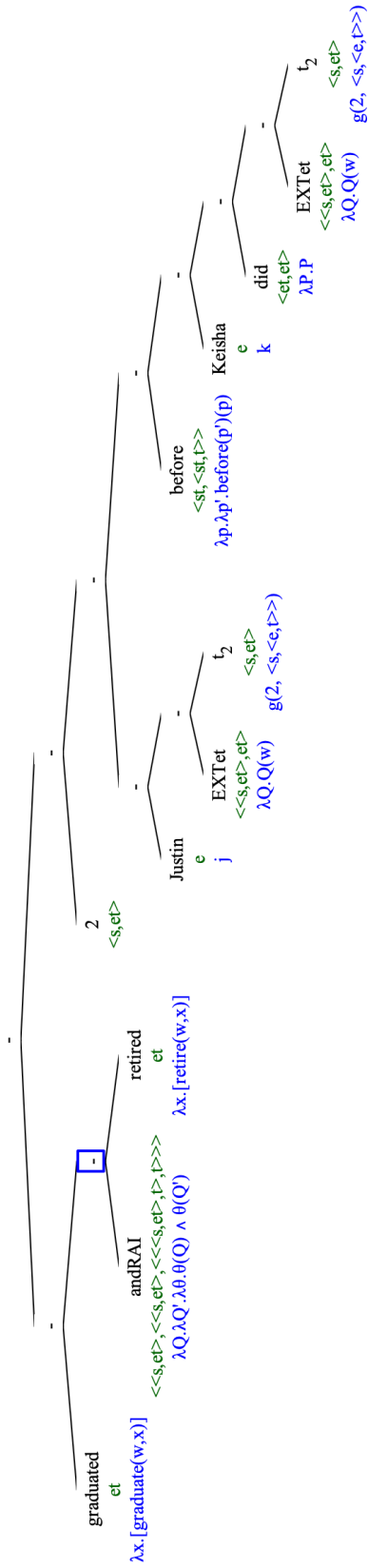
Reference—Merchant (2001). Ramified syntax is motivated by various kinds of *connectivity*— interaction between syntax outside the ellipsis site, and syntax inside the ellipsis site (or what syntax inside the site is, on the assumption of ramified syntax).
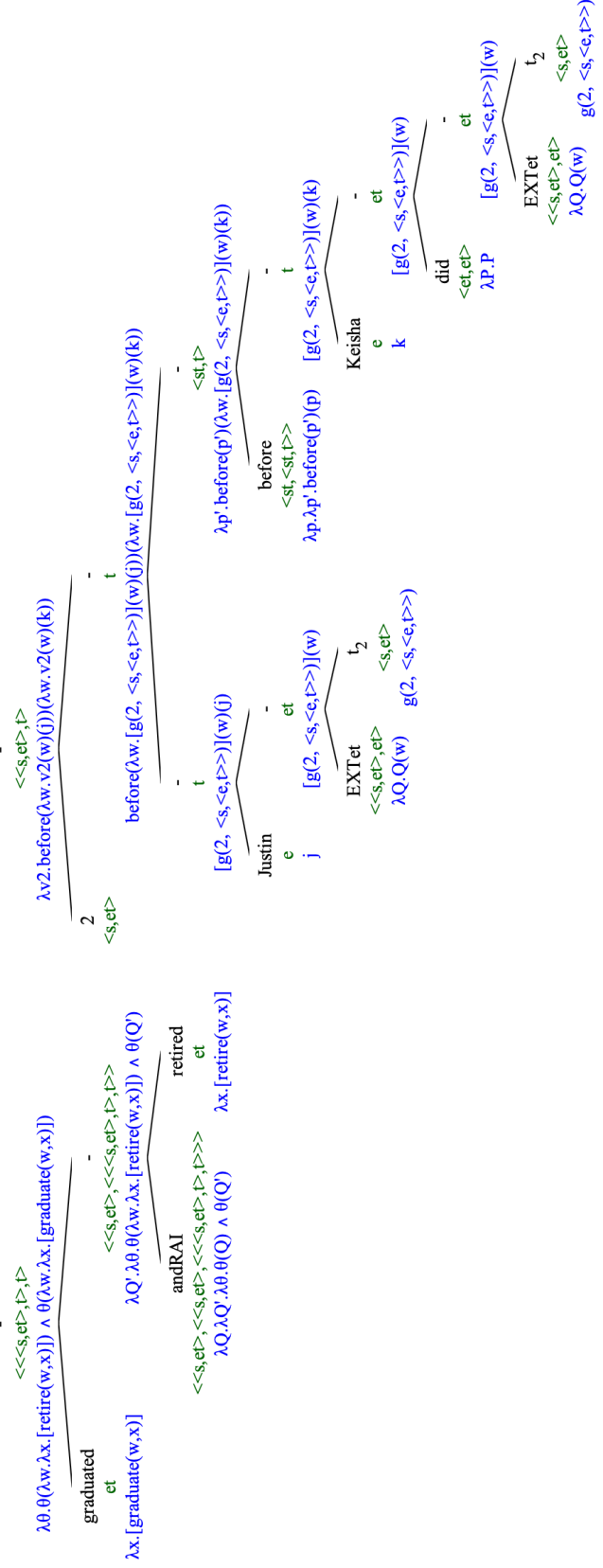
WH-extraction from ellipsis site

Literature back to Sag 1976, Williams 1977.

(12)   I know what John ate for lunch, but
    I don't know what$_2$ Bill did ~~eat e$_2$ for lunch~~.
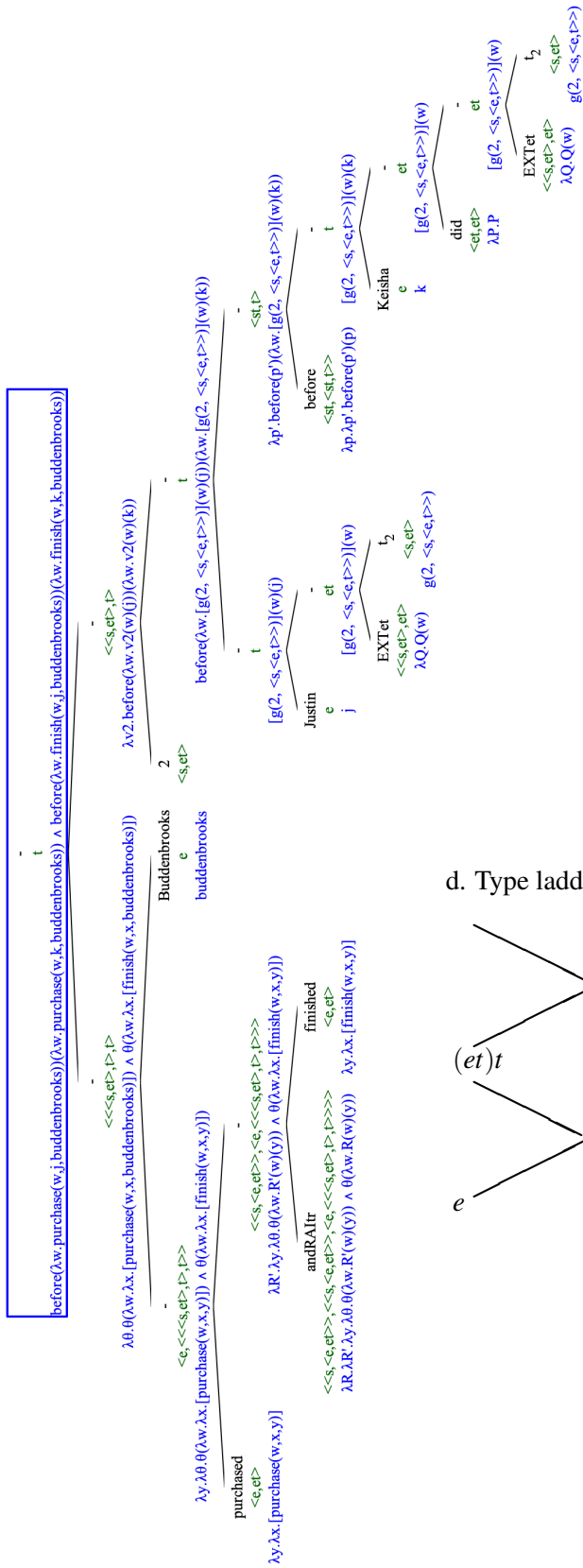
(13)a. LF with scoped propery quantifier   b. Semantic derivation

graduated
et
λx.[graduate(w,x)]

andRAI
<<s,et>,<<s,et>,<<s,et>,t>,t>>
λQ.λQ'.λθ.θ(Q) ∧ θ(Q')

retired
et
λx.[retire(w,x)]

2
<s,et>

Justin
e
j

EXTet
<<s,et>,et>
λQ.Q(w)

t₂
<s,et>
g(2, <s,<e,t>>)

before
<st,<st,t>>
λp.λp'.before(p)(p)

Keisha
e
k

did
<et,et>
λP.P

t₂
<s,et>
g(2, <s,<e,t>>)

EXTet
<<s,et>,et>
λQ.Q(w)

<<<s,et>,t>,t>
λθ.θ(λw.λx.[retire(w,x)]) ∧ θ(λw.λx.[graduate(w,x)])

graduated
et
λx.[graduate(w,x)]

andRAI
<<s,et>,<<s,et>,<<s,et>,t>,t>>
λQ.λQ'.λθ.θ(Q) ∧ θ(Q')

λθ.θ(λw.λx.[retire(w,x)]) ∧ θ(λw.λx.[graduate(w,x)])

retired
et
λx.[retire(w,x)]

t
before(λw.retire(w,j))(λw.retire(w,k)) ∧ before(λw.graduate(w,j))(λw.graduate(w,k))

2
<s,et>

<s,et>,t>
λv2.before(λw.v2(w)(j))(λw.v2(w)(k))

t
before(λw.[g(2, <s,<e,t>>)](w)(j))(λw.[g(2, <s,<e,t>>)](w)(k))

Justin
e
j

[g(2, <s,<e,t>>)](w)(j)

EXTet
<<s,et>,et>
λQ.Q(w)

[g(2, <s,<e,t>>)](w)

t₂
<s,et>
g(2, <s,<e,t>>)

<st,t>
λp'.before(p')(λw.[g(2, <s,<e,t>>)](w)(k))

before
<st,<st,t>>
λp.λp'.before(p')(p)

t
[g(2, <s,<e,t>>)](w)(k)

Keisha
e
k

[g(2, <s,<e,t>>)](w)

did
<et,et>
λP.P

et
[g(2, <s,<e,t>>)](w)

EXTet
<<s,et>,et>
λQ.Q(w)

t₂
<s,et>
g(2, <s,<e,t>>)

c. Conjoined transitive verbs generating a property quantifier

before(λw.purchase(w,j,buddenbrooks))(λw.purchase(w,k,buddenbrooks)) ∧ before(λw.finish(w,j,buddenbrooks))(λw.finish(w,k,buddenbrooks))
t

<<s,et>,t>
λθ.θ(λw.λx.[purchase(w,x,buddenbrooks)]) ∧ θ(λw.λx.[finish(w,x,buddenbrooks)])

<<<s,et>,t>,t>
<<s,et>,t>

λy.λθ.θ(λw.λx.[purchase(w,x,y)])
<e,<s,et>>

purchased
<e,et>
λy.λx.[purchase(w,x,y)]

<<s,<e,et>>,<e,<<s,et>,t>>>
λR'.λy.λθ.θ(λw.R'(w)(y)) ∧ θ(λw.λx.[finish(w,x,y)])

andRAltr
<e,et>

<<s,<e,et>>,<<s,<e,et>>,<e,<<s,et>,t>>>>
λR.λR'.λy.λθ.θ(λw.R(w)(y)) ∧ θ(λw.R'(w)(y))

finished
<e,et>
λy.λx.[finish(w,x,y)]

Buddenbrooks
e
buddenbrooks

<<s,et>,t>
λv2.before(λw.v2(w)(j))(λw.v2(w)(k))

2
<s,et>

before(λw.[g(2, <s,<e,t>>)](w)(j))(λw.[g(2, <s,<e,t>>)](w)(k))
t

t
[g(2, <s,<e,t>>)](w)(j)

Justin
e
j

EXTet
<<s,et>,et>
λQ.Q(w)

[g(2, <s,<e,t>>)](w)
et

t2
<s,et>
g(2, <s,<e,t>>)

<st,t>
λp'.before(p')(λw.[g(2, <s,<e,t>>)](w)(k))

before
<st,<st,t>>
λp.λp'.before(p')(p)

[g(2, <s,<e,t>>)](w)(k)
t

Keisha
e
k

[g(2, <s,<e,t>>)](w)
et

did
<et,et>
λP.P

[g(2, <s,<e,t>>)](w)
et

EXTet
<<s,et>,et>
λQ.Q(w)

t2
<s,et>
g(2, <s,<e,t>>)

d. Type ladder

((et)t)t   property quantifier

(et)t   individual quantifier

et   property

e   individual

4

The deleted VP has a free variable of type *e* and index 2. This seems to conflict with the hypothesis of a pro-VP of property type.

Degree binding into the ellipsis site

Compartives are commonly are analyzed with overt or covert A-bar movement and LF binding of a degree variable.

(14)   Keisha and Justin both own construction companies. Keisha is far more successful. She has bought more building lots than Justin has bought two-by-fours.

(15)   [[-er d]][Keisha has bought [d building lots]]] than [Justin has bought [d two-by-fours]]]

Or with degree binders in each clause:

(16)   [-er [λ_d [[Keisha has bought [d building lots]]]] than [λ_d[Justin has bought [d two-by-fours]]]]

The above is comparative sub-deletion. All comparatives have LFs like this with degree binding, possibly additional overt movement and binding, and varying degrees of ellipsis (von Stechow 1984, Heim 2000, Lechner 2004).

(17) a.   Keisha ate more cookies than Justin ate.   *Comparative deletion*
     b.   Keisha ate more cookies than Justin did.   *Overlay of VPE*

When there is an overlay of VP ellipsis, the deleted VP has a locally free degree variable. This seems to conflict with the hypothesis of a pro-VP of property type.

(18)   [[-er d]][Keisha ate [d cookies]]] than [Justin did ~~[eat [d cookies]]~~]]

Contrast with deep anaphora

Deep predicate anaphora is compatible with degree semantics:

(19)   Keisha ate five cookies ...
       ... and Jack did it too.
       ... and Jack did that too.
       ... and Jack did so too.

Deep predicate is not compatible comparatives that have a locally free degree variables in the deep predicate:

(20) a.   *Keisha ate more cookies than Jack did it.
     b.   *Keisha ate more cookies than Jack did that.
     c.   ?*Keisha ate more cookies than Jack did so.

I feel c. is better than a. and b., which are totally out.

It isn't that deep predicate anaphora is impossible in than-clauses. It is only a problem when the predicate embeds the degree variable bound by the comparative operator.

(21)   More people ate chocalate cookies than – had been expected to do it.
       Subject comparative deletion, with no degree variable in the predicate.

Diagnosis: Comparatives have an LF with binding of degree variables in the than-clause, as in the LF of comparative sub-deletion. This is incompatible with deep predicate anaphora, because that uses an unstructured pronoun of the predicate type *set*. There is no degree position to bind into. This argument works referring to a ramified-syntax hypothesis about the LF of comparatives. But it is also empirical and quasi-theory independent.

WH trace

(22) I know what John ate for lunch, but

     I don't know what$_2$ Bill $\left\{ \begin{array}{l} \text{*did it} \\ \text{did that} \\ \text{?did so} \end{array} \right\}$

(23) I know what John ate for lunch, but I don't know what Bill did ~~eat e$_2$ for lunch~~.

Diagnosis: A VP with wh-movement from object position has a free indexed trace, or some encoding of it. This is incompatible with a deep pro-VP of the property type *set*. This suggests VP ellipsis is not a pro-VP of property type, when the ellipsis descriptively embeds a free trace.

4. Focus licensing of ellipsis

This is the hypothesis from Rooth (1992) and Tancredi (1992) that ellipsis is in part licensed by focus. The theory of focus rather than the theory of ellipsis per se are the locus of explanation for covariant readings/sloppy identity.

Two-level architecture for ellipsis from Fiengo and May, *Indices and Identity* (Fiengo and May, 1994).

(24)
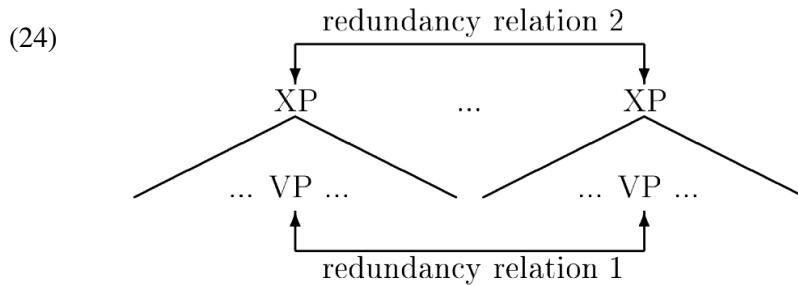
According to Rooth 1992, Relation 2 is focus anaphoricity at the propositional level, as expressed in alternative semantics.

(25) Candidate A$_{F,1}$ hopes Donald will support her$_1$.
     Candidate B$_2$ hopes he won't$_F$ ~~support her$_2$~~
     = ... Donald won't support candidate B.

This is a long-distance case of sloppy identity. A theory that looks only at VPs has trouble accounting for it.

Focus without ellipsis has the same reading, in this case called a covariant reading.

(26) [Candidate A]$_{1,F}$ hopes Donald will support her$_1$]$_3$.
     [Candidate B]$_{2,F}$ hopes he won't$_F$ support her$_2$]

The second sentence has a covariant reading for the pronoun with a focused antecedent, because the focus antecedent has the form 'y hopes Donald will support y', and not the form 'y hopes Donald will support Candidate B' (the invariant reading).

Focus with ellipsis. That a covariant/sloppy reading is possible follows from it being possible in the pure-focus non-ellipsis version. It does not have anything independent of that to do with the grammar of ellipsis.

(27) [Candidate A]$_{1,F}$ hopes Donald will support her$_1$]$_3$.
     [Candidate B]$_{2,F}$ hopes he won't$_F$ ~~support her$_2$~~]

(28)

XP$_k$ ... XP$\sim k$

... VP ... XP$_F$... VP ...

redundancy relation 1
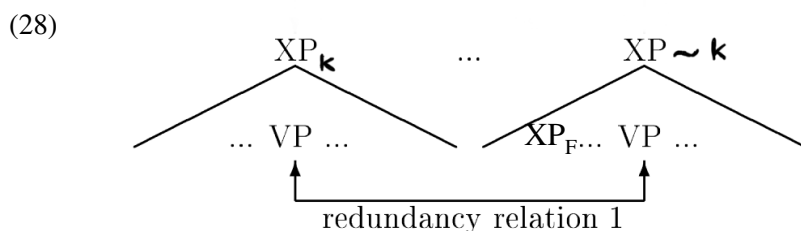
Rebound wh-traces are also licensed by focus/parallel structure. This is a case of focus licensing of ellipsis (Schuyler, 2001).

(29) [I know what$_1$ JOHN ate e$_1$ for lunch]$_2$] but
[I DON'T know what$_2$ BILL did ~~eat e$_2$ for lunch~~]$\sim$ 2.

5. Ambiguity and deep anaphora under surface ellipsis

Schwarz (2000) proposed that VPE is *ambiguous* between ramified syntax and a property pro-form. This provides for a straightforward analysis of the Boolean examples, and of co-variant readings of VPE with a focused antecedent. (13) already gave semantic derivations for **C** examples with a higher order VP binder, and a bound property variable in the ellipsis site.

Rooth (1985) and Schwarz (2001) used scoping inside the $\sim$ operator to generate covariant readings of pronouns with a focused antecedent. Below, the binding index 2 (effectively lambda) identifies the trace of QR e$_2$ with the prounoun [her$_2$].

(30) [Candidate B]$_{2,F}$ [2 [e$_2$ hopes he won't$_F$ ~~support her$_2$~~]]
Covariant alternatives '*y* hopes Donald will support *y*'

The evidence for this LF is mixed. For type *e*, (Chomsky, 1976) discussed weak crossover effects with focus. (31) seems to disallow a covariant reading with focus alternatives of the form 'the people *y* admired insulted *y*'. As expected, it does allow a merely coindexed, invariant reading.

(31) a. The people he admired rejected HIM.
    b. [him]$_{2,F}$ [4 [the people he$_4$ admired rejected e$_4$]]   covariant
    c. [him]$_{2,F}$ [4 [the people he$_2$ admired rejected e$_4$]]   invariant

However Tomioka (2008) said a weak crossover effect is not seen for VPE.

(32) If you tell me to, I will gladly quit drinking. But even if the QUEEN did, I would never quit SMOKING.

(33) When his doctor asked him to, he quit drinking.
And when his ROOMMATES did, he quit SMOKING.

(34) This winter break, nobody engaged in any dubious activities.
Not true. People who weren't allowed to — went in the TUNNELS.

(35) Of all the prohibited activities that come up in winter semester, this year people who weren't allowed to — only went in the TUNNELS.

Also focus movement for covariant readings has to violate quantifier scope islands. To represent the covariant readinng of example (4), *whistle* has to scope out of the *when*-clause.

(36) whistle$_F$[when I e$_2$] you don't e$_2$

Arguably it is unproblematic to posit two grammatically distinct kinds of scope, both with a semantics of lambda-binding. Or Charlow (2020) provided a version of alternative semantics using functional programming constructs which accounts for exceptional scope. That was applied to indefinite descriptions, but probably it can be extended to focus, as a way of producing island-escaping covariant readings.

Deep under surface: In place of a pro-VP reading of VPE, in Merchant's architecture one can posit LFs with deep anaphora under surface anaphora.

(37)   When I sang, you asked me not to sing.
       Wrong, when you WHISTLED, I asked you not to.
       Covariant alternative: when addresseee Q, speaker asked asked addressee not to Q

(38)   when you WHISTLED$_2$, I asked you not to ~~do that$_2$~~

Deep under surface LFs are discussed with a different motivation in Merchant (2005).

Summary: Derivations with property variables in the ellipsis site (or embedded in the ellipsis site) provide a reasonable account of **A**, **B**, and **C** readings.

6. Imposing connectivity

Given Section 5, we should look for versions of **A**, **B**, and **C** that have connectivity into the ellipsis site.

A with comparative

(39)   She broke more units than she was expected to.
       But she also REPAIRED more units than she was expected to.
       Covariant alternative: she R more units than she was expected to R

(40)   She broke more units than she was expected to.
       But she also REPAIRED more units than she was expected to.
       Covariant alternative: she R more units than she was expected to R

(41)   [more d][she repaired d units than she was expected to ~~repair d units~~]

This has degree binding into the ellipsis site. This is expected to be incompatible with a property variable. In fact deep anaphora is impossible.

(42)   *But she also REPAIRED more units than she was expected to do it/do that.

(43)   [more d][she repaired d units than she was expected to ~~do it~~]

C with comparative

(44)   She both damaged and repaired more units than she was expected to.
       = She damaged more units than she was expected to damage, and repaired more units than she was expected to repair.

(45)   * She both damaged and repaired more units than she was expected to do it.

(46)   She either damaged and repaired more units than she was expected to. I forget which.

B with comparative

(47)   LAST YEAR I SOLD more company stock than I was allowed to under SEC regulations.

THIS YEAR I BOUGHT more stock than I was.

== This year I bought more stock than I was allowed to buy under SEC regulations.

(48)   *THIS YEAR I BOUGHT more stock than I was allowed to do it.

WH with B

B with wh-binding is discussed in tomioka2008step, with the conclusion that wh-connectivity does not block **B** readings.

(49) a.   Why are you so upset with Fred? He bought the books he was supposed to, right?
     b.   Yeah, but then, (?) he READ the books (Op_1) that he WASN'T Δ.
          (Δ = supposed to *read* t_1)   *Tomioka (20)* **B**

(50)

(50)a.   We know which countries Kim visited. *The question is which countries she didn't do so.

Tomioka: "There are no known pronouns of any kind which can contain *wh*-traces within them."

A with WH

(51)   You can't rely on Bill. He didn't purchase the books he was supposed to purchase.
       But he READ the books he was supposed to.

Hedge: This actually seems good to me.

(52)   You can't rely on Bill. He didn't purchase the books he was supposed to purchase.
       But he READ the books he was supposed to read.

(53)   You can't rely on Bill. He was supposed to purchase some books, and read some other books.
       But he only READ the books he was supposed to.
       # But he only READ the books he was supposed to read.

This is a Tanglewood sentence (Kratzer, 1991). Maybe the A argument is unreliable, and the A data have to be replaced by Tanglewood data. It interacts with the hypothesis that Tanglewood examples involve movement of the focused phrase (Erlewine and Kotek, 2016).

Summary: Examples (42), (45) and (48) with overt deep anaphora are impossible, for a predicatable reason—the grammar of comparatives requires binding of a degree variable in the *than*-clause. This is inconsistent with a property variable. But then also a deep-under-surface LF for the VPE versions should be impossible. And a direct pro-VP reading of VPE as in Schwarz should be impossible, on the assumption that this is inconsistent with degree binding.

7. Polymorphic strategy

What is semantically copied in VPE is polymorphic. In simple cases, it is a property, type *set*. But when there is a free trace, it is a relation, type *seet*. When there is a free degree variable, it is a relation between a degree and an individual, type *sdet*.

(54) [$_{VP}$purchase t$_2$]
   syntactic category VP
   free trace with index $\langle 2, e \rangle$
   semantic type *et*
   semantics value $\lambda x.\textbf{purchase}(x, g(2))$, relative to assignment function g

(55) [$_{VP}$purchase t$_2$]
   syntactic category is VP/NP or VP^{NP}
   semantic type is *eet*, where the first *e* corresponds to the trace
   semantics is $\lambda y.\lambda x.\textbf{purchase}(x, y)$, with no reference to an assignment function.

The syntactic category indicates how to decode the argument positions of the semantics. Some arguments are decoded as real arguments, others as free traces, others as pronouns, etc. Anything that in a standard system has a free variable coming from unbound index now has an extra argument position.

Free-variable-free semantics is a technical methodology for semantics and pragmatics, which uses closed terms of lambda calculus to model the semantic and pragmatic objects one reasons about.

(56) Analogy: free-variable free information states in dynamic semantics

   A man walked in. He patted a donkey.

   $\lambda y.\lambda x.\lambda w[\textbf{man}(w,x) \wedge \textbf{donkey}(w,y) \wedge \textbf{walkin}(w,x) \wedge \textbf{pat}(w,x,y)]$

λw forms a proposition. The extra argument positions are interpreted as discourse referents. The type of information states is polymorphic, because there can be any number of discourse referents.

Free-variable-free semantic style is compatible with indices in syntax. One has to keep track of extra information in "interface signatures".

(57) $\lambda y.\lambda x.\lambda w.\textbf{purchase}(w,x,y)$
   e 2   trace
   e –   argument
   s –   world

Idea: Ellipsis picks up a discourse referent for the variable-free semantics of the antecedent.

(58) An author who$_3$ Justin admires e$_3$ and Keisha doesn't —.

(59) Semantics shared between the antecedent and the ellipsis site, via a discourse referent or bound variable of type *seet*

   $\lambda w.\lambda y.\lambda x.\textbf{admire}(w,x,y)$

(60) Interface annotations for the antecedent
   s –   world
   e 3   trace
   e –   argument

(61) Interface annotations at the ellipsis site.
   s –   world
   e 3   trace
   e –   argument

At the ellipsis site there is a pro-VP of type *eest*. It has the same interface features as found

for a non-ellipsis version.

Long-distance covariant reading

(62) Justin$_1$ asked Amelia to help him$_1$, and Jaden$_{2,F}$ asked Olivia$_F$ to —.
= Jaden asked Olivia to help Jaden.

(63) $\lambda w.\lambda y.\lambda x.\textbf{help}(w,x,y)$
antecedent

s	–	world
e	1	pronoun
e	–	argument

ellipsis

s	–	world
e	2	pronoun
e	–	argument

Effectively free pronouns and traces that are implicit in an ellipsis VP are free to chose whatever indices fit into the derivation. The choice is constrained by focus licensing of ellipsis. This is like Rooth (1992), except that the downstairs relation is model-theoretic anaphora, rather than syntactic reconstruction. This creates the potential for bound and co-variant readings of VP ellipsis, when the antecedent is focused or is a higher-order Boolean.

(64) That toilet Op$_1$ he promised to [clean e$_1$]$_2$.
This toilet Op$_3$ he REFUSED to e$_{2,seet}$.

(65) $\lambda w.\lambda y.\lambda x.\textbf{clean}(w,x,y)$
antecedent

s	–	world
e	1	trace
e	–	argument

ellipsis

s	–	world
e	3	trace
e	–	argument

The semantics $\lambda w.\lambda y.\lambda x.\textbf{clean}(w,x,y)$ is identical across the occurrences, and so can be treated as copied semantically. The interface signature are isomorphic, modulo indices. Focus licensing is satisfied. The ellipsis relation has a semantic part (identity of semantic interpretation). It also has a syntactic part—identity of interface signatures, modulo indices. Or more generally, identity of interface signatures modulo vehicle change in the sense of Fiengo and May (1994) is identical across the occurrences, and so can be treated as copied semantically. The interface signature are isomorphic, modulo indices. Focus licensing is satisfied. The ellipsis relation has a semantic part (identity of semantic interpretation). It also has a syntactic part—identity of interface signatures, modulo indices. Or more generally, identity of interface signatures modulo vehicle change in the sense of Fiengo and May (1994).

(66) Justin$_1$ asked Amelia to help him$_1$ complete his project, and Jaden$_{2,F}$ asked Olivia$_F$ to do that.

(67) THIS email Jack truculently refused to reply to. THAT email, he didn't do that.

(68) Jack needed to find about a dozen books. I don't know which ones he MANAGED to.

11

8. Commentary

At the outset, free-variable-free semantics was theoretically neutral. Any mainstream semantic account could be formulated this way, and doing so is a good idea, because it results in a compositional semantics that is logically and computationally straightforward.

Once free-variable-free semantics is applied to ellipsis as in Section 7, it is *not* theoretically neutral. Anything in syntactic-semantic theory that exhibits connectivity in ellipsis—such as weak crossover or condition B—has to be formulated in term of interface signatures rather than tree shapes, because in ellipsis examples there is no non-atomic tree shape in the ellipsis site. So there is really a lot to do in developing the analysis—Merchant catalogued thirteen varieties of connectivity. Thus the argument, if correct, has massive consequences for the architecture of grammar. However, these consequences agree with precise accounts of the minimalist syntax, and the semantics of minimalist syntax, where there is a finite amount of information—a list of features, or list of lists of features—that determine whether a given phrase fits into its syntactic context (Stabler, 1996; Collins and Stabler, 2016; Kobele, 2012).

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