CONVERGENT GRAMMAR

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The handout for this lecture is available at:

`http://www.ling.ohio-state.edu/~pollard/cvg/day5ho.pdf`

DAY FIVE: ADVANCED TOPICS

- Inverse Scope
- Parasitic Scope
- Scope Reconstruction
- Scope of Comparatives
- Scope of Coordination
- Conclusions

INVERSE SCOPE

PARASITIC SCOPE

(1) **Parasitic Scope**

- Barker (in press) introduces this term to describe quantifiers such as *the same* and *different* whose 'scope target does not exist until [another quantifier] takes its scope'.
- Other instances of this phenomenon include **superlatives** and elliptical constructions such as **phrasal comparatives**.
- Barker's analysis uses **continuations** and **choice functions**.
- We propose an account based on a notion of **focus exploitation**.

(2) **Operizers**

- Recall that an **operator** is a (syntactic or semantic) term whose type is of the form A^C_B.
- We define an **operizer** to be a functional term whose result type is an operator type.
- An operator can be thought of as a 0-ary operizer.
- Intuitively, an operizer is a 'movement trigger': it converts its argument into something that 'has to move' to take scope.

(3) **Some Signs with Operizer Semantics**

- ordinary determiners: type $(\mathrm{e} \to \mathrm{t}) \to \mathrm{e}^{\mathrm{t}}_{\mathrm{t}}$
- 'overtly moved' interrogative determiner *which*: type $(\mathrm{e} \to \mathrm{t}) \to \mathrm{e}^{\mathrm{e}\to\pi\to\mathrm{t}}_{\pi}$ (where $\pi =_{\mathrm{def}} \mathsf{s} \to \mathrm{t}$).
- (non-phrasal) comparative *-er*, assuming the *than*-phrase complement denotes a degree: type $\mathrm{d} \to \mathrm{d}^{\mathrm{t}}_{\mathrm{d}}$.
- Following (in spirit) Moortgat 1991, we can analyze **pragmatic focus** as an intonationally realized phrasal affix whose semantics has the (polymorphic) operizer type $B \to B^{\mathrm{t}}_{\mathrm{t}}$.

(4) **Semantic Focus as an Operizer 'Wild Card'**

- We suggest treating **semantic focus** as an operizer 'wild card' whose instantiation depends on what other sign is **exploiting** it.
- Best-known is the case of 'particles' (*only*, *even*, *too*) discussed under the rubric of 'association with focus', where the **focus instantiator** (FI) is just the semantics of the particle itself.
- Here we consider more complex cases of **parasitic scope**, where the focus exploiter (FE) 'contributes' **two** operizers: one its own semantics and the other the FI; the focused phrase is called the **asscociate**.
- In still more complex—**elliptical**—cases to be treated elsewhere, the FI takes **two** arguments: the associate and the FE's (extraposed) complement, called the **remnant**.

(5) **A New Grammatical Function for Phrasal Affixation**

- We add to the inventory of gramfuns the name AFFIX (abbr. A), mnemonic for '(phrasal) affixation'.
- Correspondingly, we add a new 'flavor' of Modus Ponens to the syntactic (and interface) schemata ($\multimap_{\mathrm{A}}$-Elimination).
- This is used to analyze intonationally realized phrasal affixes, Japanese and Korean case markers, Chinese sentence particles, English possessive *-'s*, etc.
- Lexical entry for English semantic focus:

  $\vdash \mathsf{foc}, \mathsf{foc'} : A \multimap_{\mathrm{A}} A, B \to B^{\mathrm{t}}_{\mathrm{t}}$

(6) **An (at Least) Triply Ambiguous Superlative Sentence**

a. Kim thinks Sandy makes the most.

b. First reading: Sandy makes the most, Kim thinks.

c. Second reading: The amount Kim thinks Sandy makes exceeds the amount Kim thinks anyone else makes.

d. Third reading: The amount Kim thinks Sandy makes exceeds the amount anyone else thinks Sandy makes.

(7) **Comments on the Preceding**

- These are all **internal** readings. Examples of this kind seem to lack decitic/external readings.
- We can force the third reading by placing the focal pitch accent on **Kim**.
- We can rule out the third reading by placing the focal pitch accent on **Sandy**.

(8) **Intuitive Explanation**

- The FE *the most* and the FI have adjacent scope ('parasitic scope' or 'tucking in').
- If **Kim** is focused, then they have to scope at the root clause (because operators can raise but not lower).
- If **Sandy** is focused, then there is ambiguity as to whether it scopes in the root clause or the complement clause.

(9) **Toward an Analysis of Superlatives**

a. **Fido** cost <u>the most</u>.

b. We take this to mean that Fido is the unique maximizer of the function that maps (relevant) entities to their prices.

c. We assume something's price is the maximum amount that it costs.

d. So our target semantics for this sentence is
$\mathsf{um}(\mathsf{Fido'})_{\underline{x}}.\mathsf{max}_{\underline{d}}.\mathsf{cost'}(\underline{d})(\underline{x})$
where the operizer um is subject to the meaning postulate

e. $\vdash \mathsf{um} = \lambda_x.\lambda_f.\forall_y((y \neq x) \rightarrow (f(x) > f(y))) : \mathrm{e} \rightarrow \mathrm{e}^{\mathrm{t}}_{\mathrm{d}}$

f. After normalization, (d) translates to:
$\forall_y((y \neq \mathsf{Fido'}) \rightarrow [\mathsf{max}(\lambda_d.\mathsf{cost'}(d)(\mathsf{Fido'})) > \mathsf{max}(\lambda_d.\mathsf{cost'}(d)(\mathsf{x}))])$

g. This is the semantics our theory will predict, as long as the semantics of *the most* is max and focus is instantiated as um.

g. But how?

(10) **Instantiating Focus**

a. Lexical entries:

$\vdash \mathsf{cost}, \mathsf{cost'} : \mathrm{Deg} \multimap_{\mathrm{C}} \mathrm{NP} \multimap_{\mathrm{S}} \mathrm{S}$

$\vdash \mathsf{the\_most}, \mathsf{IF}(\mathsf{um}) \cdot \mathsf{max} : \mathrm{Deg}, \mathrm{d}_{\mathrm{t}}^{\mathrm{d}} \dashv$

The semantics here means: 'max directly outscoped by the result of instantiating focus as um'.

b. Focus Instantiation Semantic Schema (FI)

If $\Gamma \vdash a \dashv \mathsf{foc'}(b)_x; \mathsf{IF}(c) \cdot d_y; \Delta$,

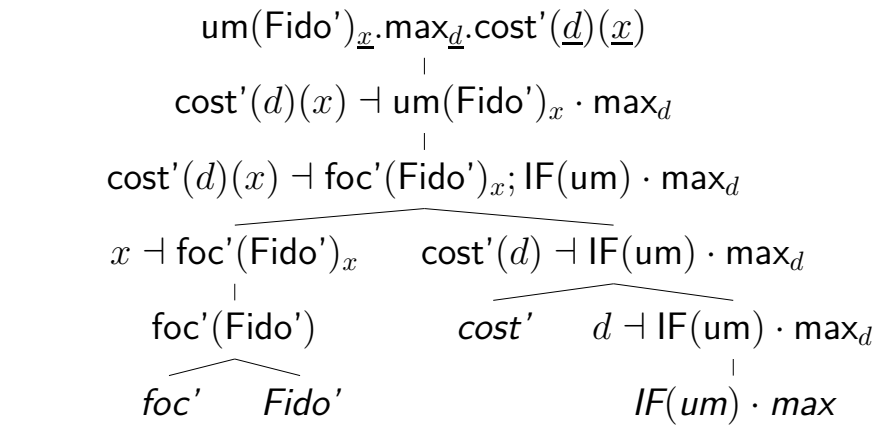
then $\Gamma \vdash a \dashv c(b)_x \cdot d_y; \Delta$

Note that in the corresponding interface schema, nothing happens in the syntax.

(11) **Analysis of a Superlative Sentence**

a. Syntax:
(^{S} (foc Fido ^{A}) (cost the_most ^{C}))

b. Semantics:



c. Normalized TLC translation:
$\forall_y((y \neq \text{Fido'}) \rightarrow [\text{max}(\lambda_d.\text{cost'}(d)(\text{Fido'})) > \text{max}(\lambda_d.\text{cost'}(d)(\text{x}))])$

(12) ***The Same***

a. Plural-focus *the same*:

Fido and Felix got the same present.

$\exists_y(\mathsf{present'}(y) \wedge \forall_x[(x <_\mathsf{a} \mathsf{Fido'} + \mathsf{Felix'}) \rightarrow \mathsf{get'}(y)(x)])$

Here + denotes Link join (plural formation), and $<_\mathsf{a}$ denotes the part-of relation between an atom and a plural.

b. Elliptical (associate-remnant) *the same*:

Fido got the same present *as* **Felix**.

$\exists_y(\mathsf{present'}(y) \wedge \mathsf{get'}(y)(\mathsf{Fido'}) \wedge \mathsf{get'}(y)(\mathsf{Felix'}))$

c. These sentences have equivalent truth conditions.

d. Here we only analyze plural-focus *the same*.

e. Elliptical *the same* and other associate-remnant constructions are analyzed in work in progress.

(13) **Analysis of Plural-Focus *The Same***

a. We cannot escape from positing a special coordination rule with semantics corresponding to Link join (plural formation).

b. We also need a new basic semantic type e' for plural entities.

c. Syntactically, plural-focus *the same* is just a determiner.

d. But semantically, it is an FE operizer:

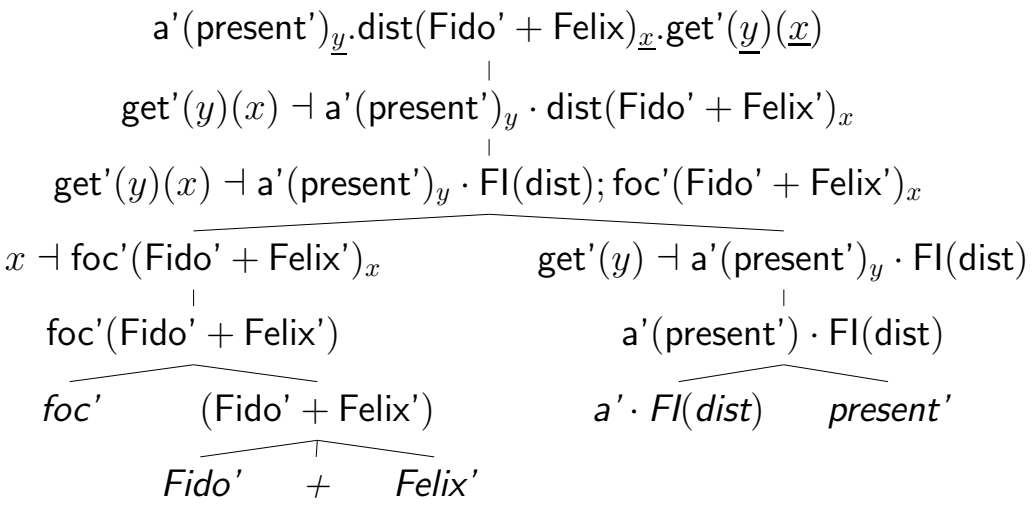
   1. Its own semantics is the existential generalized determiner $\mathsf{a'}$.
   2. The FI is the distributive operizer dist that converts a plural to a universal quantifier, characterized by the meaning postulate $\vdash \mathsf{dist} = \lambda_{x'}.\lambda_P.\forall_x((x <_{\mathsf{a}} x') \rightarrow P(x)) : \mathrm{e}' \rightarrow \mathrm{e}^{\mathrm{t}}_{\mathrm{t}}$
   3. Unlike *the most*, in this case the FE outscopes the FI.

e. So the lexical entry for *the same* is:
   $\vdash \mathsf{the\_same}, \mathsf{a'} \cdot \mathsf{FI}(\mathsf{dist}) : \mathrm{N} \multimap_{\mathrm{SP}} \mathrm{NP}, \mathrm{et} \rightarrow \mathrm{e}^{\mathrm{t}}_{\mathrm{t}}$

(14) **Analysis of a Plural-Focus *The Same* Sentence**

a. Syntax: ([S] (foc (Fido and Felix) [A]) (got (the_same present [SP]) [C]))

b. Semantics:



c. Normalized TLC translation:
$\exists_y(\text{present'}(y) \wedge \forall_x[(x <_{\text{a}} \text{Fido' + Felix'}) \rightarrow \text{get'}(y)(x)])$

SCOPE OF COMPARATIVES

SIMPLE COMPARATIVES

(15) **Three Kinds of Comparatives**

We illustrate the applicability of Cooper storage to the analysis of three kinds of English comparative construction

a. Jo owes more than five dollars to Bo. (simple comparative)

b. Jo owes more than Yo spent *d* on Fido to Bo. (comparative subdeletion)

c. JO owes more to Bo than KIM. (phrasal comparative)

d. Jo owes more to BO than to KIM. (phrasal comparative)

Note: In the simple and subdeletion examples, the *than*-phrase can be extraposed; while in phrasal comparatives, the *than* phrase *must* extrapose to the right of both the comparative morpheme and the pitch-accented phrase with which it is compared (the **associate**). We will not analyse such facts today though.

(16) **Preliminary Observations**

a. All comparatives contain a **comparative morpheme** (here, *more*), and a phrase introduced by either *than* or *as* (here the former).

b. In **simple** comparatives, the complement of *than* is a **degree** phrase (Deg).

c. In **subdeletion** comparatives, the *than*-complement is a sentence that appears to have a Deg missing (in traditional terminology, **subdeleted**), indicated by *d*.

d. Each **phrasal comparative** has two phrases, optionally bearing focal pitch accents, which, intuitively, denote the two things being compared. One of them, called the **remnant**, appears to be the *than* complement; and the other is called the **associate**.

e. Semantically, each sentence expresses a comparison between two **degrees** belonging to the same **scale** (here, the scale whose members are monetary values, such as the one denoted by *five dollars*).

(17) **Informal Meaning Analysis**

a. The (maximum) amount that Jo owes to Bo exceeds five dollars.

b. The (maximum) amount that Jo owes to Bo exceeds the (maximum) amount that Yo spent on Fido.

c. The (maximum) amount that Jo owes to Bo exceeds the (maximum) amount that Kim owes to Bo.

d. The (maximum) amount that Jo owes to Bo exceeds the (maximum) amount that Jo owes to Kim.

(18) **Slightly More Formal Meaning Analysis**

a. Jo owes more than five dollars to Bo. (simple comparative)
$\mathsf{lub}(\lambda_d \mathsf{owe'}(\mathsf{bo'})(d)(\mathsf{jo'})) > \mathsf{\$5}$

b. Jo owes more than Yo spent d on Fido to Bo. (comparative subdeletion)
$\mathsf{lub}(\lambda_d \mathsf{owe'}(\mathsf{bo'})(d)(\mathsf{jo'})) > \mathsf{lub}(\lambda_d \mathsf{spend'}(\mathsf{fido'})(d)(\mathsf{yo'}))$

c. JO owes more to Bo than KIM. (phrasal comparative)
$\mathsf{lub}(\lambda_d \mathsf{owe'}(\mathsf{bo'})(d)(\mathsf{jo'})) > \mathsf{lub}(\lambda_d \mathsf{owe'}(\mathsf{bo'})(d)(\mathsf{kim'}))$

d. Jo owes more to BO than to KIM. (phrasal comparative)
$\mathsf{lub}(\lambda_d \mathsf{owe'}(\mathsf{bo'})(d)(\mathsf{jo'})) > \mathsf{lub}(\lambda_d \mathsf{owe'}(\mathsf{kim'})(d)(\mathsf{jo'}))$

(19) **Fine Points**

- For simplicity we stick to extensional analysis, using basic types e, t, and d (degrees).
- We would need intensional types, e.g. degree concepts, for non-rigid degree expressions like *Fido's price*.
- We pretend the only scale is degrees of monetary value.
- In a richer fragment, we would need different types for degrees in different scales, e.g. linear extents, areas, volumes, masses, velocities, etc.

(20) **Some Even Finer Points**

- We use least upper bounds (lub] rather than the usually assumed maximums. (If you don't know the difference, don't worry unless you plan to work on comparatives.)
- Maximums work fine as long as the scales are all linearly ordered and all the sets of degrees that arise actually *have* one.
- Additionally we assume the set of degrees is is endowed with a strict partial order $<$, such that every set of degrees has a lub.
- I.e., the set of degrees ordered by $<$ is a complete join-semilattice.
- In the present case, this requires adjoining a top element that represents having infinite monetary value.
- Without these assumptions, analyses of subdeletion tend to fail for unexpected, nonlinguistic, reasons.

(21) **The Hard Parts**

The hard work is going to be assigning meanings to:

a. *than*

b. *more*

c. whatever it is that 'happened' to the associate phrase, that can be reflected phonologically as a focal pitch accent.

d. *d* (the inaudible thing where subdeletion 'happened')

(22) **Where We are Going with This**

We will analyze these expressions as follows:

a. *than'* is $>$, the dual (= reverse) of the $<$ order on the scale.

b. *more'* is a semantic operizer ("covert movement trigger") that maps a set of degrees to a generalized quantifier over degrees.

c. The focal pitch accent on the associate is the phonological realization of another semantic operizer, which converts the phrase it marks into a semantic operator, thereby forcing it to (in TG parlance) "undergo covert focus raising".

d. The inaudible subdeletion operator is precisely the lub operator that maps a set of degrees to a degree.

(23) **Lexicon for Simple Comparatives (Boring Part)**

$\vdash \mathsf{fido}, \mathsf{fido}' : \mathrm{NP}, \mathrm{e} \dashv$ (likewise other names)

$\vdash \mathsf{\$5}, \mathsf{\$5}' : \mathrm{Deg}, \mathrm{d} \dashv$

$\vdash \mathsf{owes}, \mathsf{owe'} : \mathrm{Deg} \multimap_{\mathrm{C}} \mathrm{To} \multimap_{\mathrm{C}} \mathrm{NP} \multimap_{\mathrm{S}} \mathrm{S},$
$\mathrm{d} \to \mathrm{e} \to \mathrm{e} \to \mathrm{t} \dashv$

$\vdash \mathsf{spent}, \mathsf{spend'} : \mathrm{Deg} \multimap_{\mathrm{C}} \mathrm{On} \multimap_{\mathrm{C}} \mathrm{NP} \multimap_{\mathrm{S}} \mathrm{S},$
$\mathrm{d} \to \mathrm{e} \to \mathrm{e} \to \mathrm{t} \dashv$

$\vdash \mathsf{to}, \mathsf{id} : \mathrm{NP} \multimap_{\mathrm{C}} \mathrm{To}, \mathrm{e} \to \mathrm{e} \dashv$

$\vdash \mathsf{on}, \mathsf{id} : \mathrm{NP} \multimap_{\mathrm{C}} \mathrm{On}, \mathrm{e} \to, \mathrm{e} \dashv$

Note: New syntactic categories: Deg (degree phrase): On (nonpredicative PP headed by *on*); To (nonpredicative PP headed by *to*); Th (*than*-phrase).

(24) **Lexicon for Simple Comparatives (Interesting Part)**

$\vdash \mathsf{than}_{\mathrm{Deg}}, >: \mathrm{Deg} \multimap_{\mathrm{C}} \mathrm{Th}, \mathrm{d} \rightarrow \mathrm{d} \rightarrow \mathrm{t} \dashv$

This *than* takes a Deg complement; it denotes $>$, which is a binary relation on degrees.

$\vdash \mathsf{more}, \mathsf{more}' : \mathrm{Th} \multimap_{\mathrm{C}} \mathrm{Deg}, (\mathrm{d} \rightarrow \mathrm{t}) \rightarrow \mathrm{d}^{\mathrm{t}}_{\mathrm{t}} \dashv$

This *more* takes a *than*-phrase complement to form a Deg. The Deg so formed denotes **not** a degree (type d), but rather a **generalized quantifier over degrees** (type $\mathrm{d}^{\mathrm{t}}_{\mathrm{t}}$).

This means *more* is a **semantic operizer** (covert movement trigger).

The RC constant more' translates into Ty2 as B'(lub), where lub is the least upper bound function on sets of degrees, and B' is the combinator $\lambda_f \lambda_Q \lambda_P Q(f(P))$ (function composition, but with its first two arguments permuted).

(25) **Simple Comparative Example**

Syn: (^{s} jo ((owes (more (than \$5 ^{c}) ^{c}) ^{c})(to bo ^{c}) ^{c}))

RC: more′($>$ (\$5′))$_{\underline{d}}$(owe' bo′ d jo′)

Ty2: lub(λ_{d}owe'(bo')($\underline{d}$)(jo')) $>$ \$5

SUBDELETION

(26) **Additional Lexicon for Comparative Subdeletion**

$\vdash \mathsf{than}_{\mathrm{S}}, <\!\!: \mathrm{S} \multimap_{\mathrm{C}} \mathrm{Th}, \mathrm{d} \to \mathrm{d} \to \mathrm{t}$

This *than* takes a degree-denoting sentential complement. (Yes, there are such things, as we'll see!)

$\vdash \mathsf{trice}, \mathsf{lub} : \mathrm{Deg}, \mathrm{d}^{\mathrm{d}}_{\mathrm{t}}$

- This the inaudible Deg (nicknamed "trice" in HPSG) involved in Comparative Subdeletion.
- Semantically it is an operator that binds a degree variable in a boolean expression, returning a degree (type $\mathrm{d}^{\mathrm{d}}_{\mathrm{t}}$).
- In lambda-calculus terms, it maps a set of degrees to a degree (by taking the least upper bound).
- Alternatively, we could analyze trice as a Deg trace, and make $\mathsf{than}_{\mathrm{S}}$ a syntactic operator (category $\mathrm{S}^{\mathrm{Th}}_{\mathrm{Deg}}$) that binds it.

(27) **A Subdeletion Example**

We only show the analysis of the *than*-clause, since otherwise subdeletion comparatives work just like simple comparatives.

Syn: $(\mathsf{than}_{\mathrm{S}}\ (^{\mathrm{S}}\ \mathsf{yo}\ ((\mathsf{spent\ trice}\ ^{\mathrm{C}})(\mathsf{on\ fido}\ ^{\mathrm{C}})\ ^{\mathrm{C}}))\ ^{\mathrm{C}}) : \mathrm{Th}$

RC: $(>\ \mathsf{lub}_{\underline{d}}(\mathsf{spend'}\ \underline{d}\ \mathsf{fido'}\ \mathsf{yo'})) : \mathrm{d} \rightarrow \mathrm{t}$

Note: Now you know where degree-denoting sentences come from.

PHRASAL COMPARATIVES

(28) **Phrasal Comparative Examples Recalled**

a. JO owes more to Bo than KIM.
$\mathsf{lub}(\lambda_d \mathsf{owe'}(\mathsf{bo'})(d)(\mathsf{jo'})) > \mathsf{lub}(\lambda_d \mathsf{owe'}(\mathsf{bo'})(d)(\mathsf{kim'}))$

b. Jo owes more to BO than to KIM.
$\mathsf{lub}(\lambda_d \mathsf{owe'}(\mathsf{bo'})(d)(\mathsf{jo'})) > \mathsf{lub}(\lambda_d \mathsf{owe'}(\mathsf{kim'})(d)(\mathsf{jo'}))$

c. Remember the *than*-complement is called the **remnant**, and the (potentially focus-accented) phrase in the main clause (everything except the *than*-phrase) is called the **associate**.

d. The truth conditions of the sentence depend on which phrase in the main clause is the associate.

e. Roughly, the associate and the remnant are being compared.

f. But more precisely, two **degrees** are being compared.

g. One of those degrees relates to the associate, and the other to the remnant.

(29) **The Intuition behind Phrasal Comparatives**

- Phrasal comparatives are a kind of **ellipsis** construction.
- In order to find the degree related to the remnant *KIM* in
  JO owes more to Bo than KIM
  we must:
  - make a copy of the "ellipsed" material "x owes d to Bo", which resulted from covertly moving the associate *JO* and the comparative operator *more* out of the main clause
  - lambda-abstract on d, then on x
  - apply the resulting abstract to the remnant
  - take the lub of the result.
- Then we do exactly the same thing again, but with the associate instead of the remnant, and compare the two degrees.

(30) **Toward a Semantics of Phrasal Comparatives**

- JO owes more to Bo than KIM.
- We need a new *more*, $\mathsf{more_{pc}}$, that does not combine directly with a *than*-phrase, because the contribution of *than* will be brought in only at the very end.
- So we don't need to apply that combinator B'; we can just take the meaning to be the lub operator:
  $\vdash \mathsf{more_{pc}}, \mathsf{lub} : \mathrm{Deg}, \mathrm{d}_{\mathrm{t}}^{\mathrm{d}} \dashv$
- Since we also need to covertly "evict" *JO*, we need to assume an **associate semantic operizer**
  $\vdash \mathsf{assoc}, \mathsf{assoc'} : A \multimap_{\mathrm{A}} A_{\mathrm{S}}^{\mathrm{S}}, B \to B_{\mathrm{t}}^{\mathrm{t}} \dashv$
  that turns (the meaning of) *Jo* into an operator.
- We'll worry about what assoc' means in a moment.

(31) **The Main Clause of a Phrasal Comparative**

Syn: (^{S} (jo assoc ^{A}) ((owes more$_{pc}$ (to bo ^{C}) ^{C})) : S

RC: assoc'(jo')$_x$lub$_d$(owe' d bo' x) : e $\rightarrow$ (d $\rightarrow$ d $\rightarrow$ t) $\rightarrow$ t

Ty2: assoc(jo')(λ_x.lub(λ_d.owe'(d)(bo')(x))) : (d $\rightarrow$ d $\rightarrow$ t) $\rightarrow$ e $\rightarrow$ t

We know the type (up to permutation of the aruments) because we know it still has to apply to the 'main connective of the ellipsis' (namely >), and then finally to the remnant.

- We also know the target semantics for the whole sentence:
  lub($\lambda_d$owe'(bo')(d)(jo')) > lub($\lambda_d$owe'(bo')(d)(kim'))
- This is enough to calculate the meaning of the associate operizer.

(32) **The Meaning of the Associate Operizer**

- Remember that τ is the transform from RC to Ty2, and assoc' is the RC constant for the meaning of the associate operizer.
- Then τ(assoc') is
  $\lambda_x\lambda_P\lambda_r\lambda_y.r(P(y))(P(x)) : \mathrm{e} \rightarrow (\mathrm{e} \rightarrow \mathrm{d}) \rightarrow (\mathrm{d} \rightarrow \mathrm{d} \rightarrow \mathrm{t}) \rightarrow \mathrm{e} \rightarrow \mathrm{t}$
- For our current example, the values fed to this operizer are
  a. the associate jo
  b. the ellipsed environment λ_x.lub(λ_d.owe'(bo')(d)(x))
  c. the main connective of the ellipsis, $>$
  d. the remnant kim'
- In short, the associate operizer feeds both the the associate and the remnant to the ellipsed environment, obtaining (in this case) two degrees, which are then compared using the main connective.
- But actually, the operizer is polymorphically typed and has application to a whole range of ellipsis constructions.

SCOPE OF COORDINATION

CONCLUSIONS

(33) **Summing Up**

- EMG had a good theory of how to repair the T-model.
- But so far the story has not been told in a way that has gained it mainstream acceptance.
- Howard (1980) provided the technology to retell the EMG story simply and clearly.

(34) **The EMG Story Retold**

- Syntactic and semantic derivations are **parallel**, not cascaded.
- Derivations are **proofs**, not sequences of tree operations.
- **All** signs have a semantics ('it's phases all the way down').
- Traces are **ordinary logical variables**, not copies of their binders.
- **There is no 'Trace Conversion'**: traces are paired with semantic variables from birth.
- Merge is **Modus Ponens**.
- 'Overt Move' works as **Gazdar** said.
- 'Covert Move' works as **Cooper** said.
- Rules can intermingle because that's always the case in proofs.
- Interpretation of the semantic proof is **simple** and **explicit**.
- **There is no 'LF'** between syntax and semantics.