Topic Abstraction as the Source for Nested Alternatives
A Conservative Semantics for Contrastive Topic

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1. Overview

○ Motivate new semantics for contrastive topic (CT):
- CT phrase undergoes LF movement to operator position
- CT operator produces nested alternatives in the focus dimension
- Focus alternatives related to discourse via Rooth's squiggle ($\sim$)

○ Extends naturally to CT questions, multiple CT; covers new island data
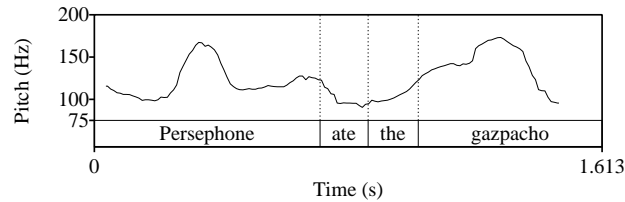
2. Contrastive Topic

○ Roughly, CT marks non-resolution of a particular question.

(1) **CT + F**

A: What about Persephone and Antonio? What did *they* eat?
B: [*Persephone*]$_{CT}$ … ate the [*gazpacho*]$_F$.
   L+H* L-H%   H* L-L%

(2) **CT Resists Resolving Answers**

(Which train did they take?)

a. [*Most*]$_{CT}$ of them … took the [*early*]$_F$ train.
    L+H*   L-H%   H*   L-L%

b. #[*All*]$_{CT}$ of them … took the [*early*]$_F$ train.
    L+H*   L-H%   H*   L-L%

(3) **F + CT**

A: What about the gazpacho and the ceviche? Who ate *those*?
B: [*Persephone*]$_F$ ate the [*gazpacho*]$_{CT}$.
   H* L-L%   L+H* L-H%

(4) **Lone CT (Rise-Fall-Rise)**

A: What about Persephone and Antonio? Did *they* eat the gazpacho?
B: [*Persephone*]$_{CT}$ ate the gazpacho…
   L+H*   L-H%

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(5) **Japanese CT *wa* Marks Contrastive Topics In Situ**   Tomioka 2010b: 123

A: Who ate what?

B: *Erika*-**wa**   *mame*-o   tabe-ta   (kedo)
   Erika-TOP   beans-ACC   eat-PAST   but
   'Erika ate beans, but …'

(6) **Mandarin CT *ne* Marks Left-Peripheral Topic in CT+F**   Constant 2011: 18

a. *Dàbùfen* de shìqing **ne** dōu   hěn nán-bàn.
   most   DE matter NE DISTR very difficult-manage
   'Most of these things are hard to deal with.'

b. *Suǒyǒu* de shìqing (#**ne**) dōu   hěn nán-bàn.
   all   DE matter   NE DISTR very difficult-manage
   'All of these things are hard to deal with.'

(7) **Mandarin Sentence-Final CT *ne* Marks Sentences with Lone CT**   Constant 2011: 19

a. (Is Zhangsan going to the conference?)
   Tā gēn wǒ *shuō* yào qù **ne**… (dànshì tā hái méi   mǎi jī-piào.)
   he with me say will go NE   but   he still have.not buy plane-ticket
   'He *told* me he's going… (but he still hasn't bought a plane ticket.)'

b. (How did you find out that Zhangsan is going to the conference?)
   Tā gēn wǒ *shuō* yào qù (#**ne**).
   he with me say will go   NE
   'He *told* me he's going.'

3. Büring's Proposal

> **Overview**
>
> ○ CT marks response to question within larger STRATEGY delimited by ct-value $[\![\cdot]\!]^{ct}$ of response.
> ○ F- and CT-marks in the syntax.
> ○ $[\![\cdot]\!]^{ct}$ = substitute *first* for F-marked phrase(s), *then* for CT-marked phrase(s).

(8) **CT-Congruence**   Büring (2003: 520)

a. Utterance U containing CT can map onto a move M within a discourse tree D only if U indicates a strategy around M_U in D.

b. U indicates a strategy around M_U in D iff there is a non-singleton set Q′ of questions such that for each $Q \in Q'$ —
   (i) Q is identical to or a sister of the question that immediately dominates M_U, and
   (ii) $[\![Q]\!]^o \in [\![U]\!]^{ct}$

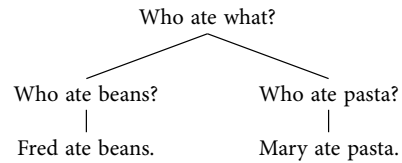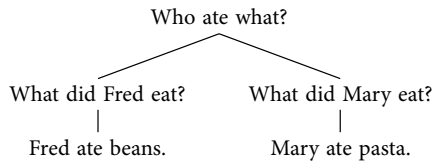(9) **ct-Value Composition**   Büring (2003: 539)

$[\![A]\!]^{ct} =$

a.   if A is F-marked, $\{\ D_{type(A)}\ \}$
b. otherwise, if A is CT-marked, $\{\ \{\alpha\} \mid \alpha \in D_{type(A)}\ \}$
c. otherwise, if A is a terminal, $\{\{\ [\![A]\!]^o\ \}\}$
d. otherwise, if A = [B], $[\![B]\!]^{ct}$
e. otherwise, if A = [B C], $\{\ \beta \mid \exists b,c\ [\ b \in [\![B]\!]^{ct}\ \&\ c \in [\![C]\!]^{ct}$
                                   $\&\ \beta = \{\alpha \mid \exists b',c'\ [\ b' \in b\ \&\ c' \in c\ \&\ \alpha = b' + c'\ ]\}\ ]\ \}$

(10) $[\![\ [\ \text{Fred}\ ]_{\text{CT}}\ \text{ate}\ [\ \text{the beans}\ ]_{\text{F}}\ ]\!]^{ct}$

$= \{\ \{\ x\ \text{ate}\ y\ |\ y \in D_e\ \}\ |\ x \in D_e\ \}$

$$= \left\{ \begin{array}{l} \{\text{Fred ate beans, Fred ate pasta, ...}\}, \\ \{\text{Mary ate beans, Mary ate pasta, ...}\}, \\ \cdots \end{array} \right\}$$

= 'For each person, what did they eat?'

Who ate what?
```
            Who ate what?
           /            \
What did Fred eat?    What did Mary eat?
      |                     |
 Fred ate beans.        Mary ate pasta.
```

(11) $[\![\ [\ \text{Fred}\ ]_{\text{F}}\ \text{ate}\ [\ \text{the beans}\ ]_{\text{CT}}\ ]\!]^{ct}$

$= \{\ \{\ x\ \text{ate}\ y\ |\ x \in D_e\ \}\ |\ y \in D_e\ \}$

$$= \left\{ \begin{array}{l} \{\text{Fred ate beans, Mary ate beans, ...}\}, \\ \{\text{Fred ate pasta, Mary ate pasta, ...}\}, \\ \cdots \end{array} \right\}$$

= 'For each food, who ate it?'

```
            Who ate what?
           /            \
   Who ate beans?    Who ate pasta?
         |                 |
  Fred ate beans.     Mary ate pasta.
```

4. Empirical Problems

4.1. CT Questions

Basic Observation

○ CT-marked statements *answer* sub-questions within a strategy
○ CT-marked questions *are* sub-questions within a strategy

(12) **Japanese *wa* Marks Contrasting Sub-Questions**

... Zyaa *Erika*-**wa** doko-e itta-no?   Tomioka 2010a: 6
then Erika-TOP where went-Q
'..., well then, where did *Erika* go?'

(13) **Mandarin *ne* Marks Contrasting Sub-Questions**

Context: A calls B on the phone out of the blue.   Constant 2011: 20

A: Nǐ xiǎng-bù-xiǎng jīntiān wǎnshàng chū-qù chī huǒguō (??**ne**)?
you want-not-want today night out-go eat hotpot NE
'Do you want to go out for hotpot tonight?'

B: Not really.

A: (Nà) nǐ xiǎng-bù-xiǎng chī *shuǐ-zhǔ-yú* **ne**?
then you want-not-want eat water-boil-fish NE
'Then do you want to have *boiled fish*?'

(14) **Turkish Sentence-Final 'mı' Marks Contrasting Sub-Questions**

Ali hiç *iskambil* oynar **mı**?   Kamali and Büring 2011
Ali ever cards plays Q
'Is *cards* one of the things Ali plays?' (non-exhaustive)

(15) **No Overt CT in English Questions**

(And) what did [*Fred*]_{CT} eat?
            H*   L-L%

Why no CT in English questions?

○ Too many morphemes at the boundary?

(16) **Mandarin CT *ne* vs. Polar Question *ma***

(He can play the violin...)

a. *Nǐ* huì bù huì { **ne** | #ma | #ne ma | #ma ne } ?
you can not can NE   MA   NE MA   MA NE
'Can *you* **NE**?'

b. *Nǐ* huì { **ma** | #ne | #ne ma | #ma ne } ?
you can NE   MA   NE MA   MA NE
'Can *you* **MA**?'

Problem for Büring 2003

○ Recast CT-congruence as a disjunction (statements vs. questions)
○ But, the ct-value still isn't what we want!

○ $[\![\alpha]\!]^{ct}$ is a set of sets of type $[\![\alpha]\!]^o$ (provable from (9) by induction)

○ $[\![\ \text{question}\ ]\!]^o \in D_{\langle\langle s,t\rangle,t\rangle}$ "question"
○ $[\![\ \text{question}\ ]\!]^{ct} \in D_{\langle\langle\langle\langle s,t\rangle,t\rangle,t\rangle,t\rangle}$ "set of sets of questions"

○ "Büring (2003) predicts focusing in questions has an effect parallel to CT-marking in answers."
— Kamali and Büring 2011

4.2. Multiple CT

Basic Observation

○ Multiple CT can give rise to complex sorting
○ The higher CT is sorted higher in the discourse

(17) a. For each day of the week, what does everyone do on that day?
b. For each person, what do they do on the different days of the week?

(18) a. On *Sundays*, *Fred* stays *home*. { But *Mary works* (on Sundays). | ??But on *Mondays*, he *works*. }
L+H* L-H%   L+H* L-H%   H* L-L%

b. *Fred*, on *Sundays*, he stays *home*. { But on *Mondays*, he *works*. | ??But *Mary works* (on Sundays). }
L+H* L-H%   L+H* L-H%   H* L-L%

(19) **Japanese Multiple CT *wa***

Jon-**wa** Mearii-**wa** Biru-ni-**wa** shookai-shi-ta.   (Yabushita 2008)
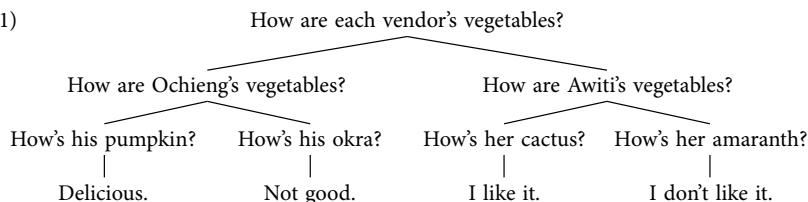John-CT Mary-CT Bill-to-CT introduction-do-PAST
'John_{CT} introduced Mary_{CT} to Bill_{CT}.'

(20) **Dholuo Multiple CT _to_**

    A: Whose vegetables do you like the best?

    B: Buth   Ochieng′ .mit ahinya, to apodhe   to ok .mit.
        pumpkin.POSS Ochieng′ tasty very   but okra.POSS CT not tasty
        Awiti **to** odiende   **to** a-hero, to omboke   to ok a-hero.
        Awiti CT cactus.POSS CT 1SG-like but amaranth.POSS CT not 1SG-like
        'Ochieng's _pumpkin_ is delicious, but his _okra_ is not good.
        Awiti, her _cactus_, I like, but her _amaranth_ I don't.'

(21)

                      How are each vendor's vegetables?

      How are Ochieng's vegetables?   How are Awiti's vegetables?

How's his pumpkin? How's his okra?   How's her cactus? How's her amaranth?

Delicious.   Not good.   I like it.   I don't like it.

Problem for Büring 2003

- $[\![\alpha]\!]^{ct}$ is a set of sets of type $[\![\alpha]\!]^o$

- $[\![\,[\,[\text{XP}]_{CT} \dots [\text{YP}]_F\,]_{Decl}\,]\!]^{ct} \in D_{\langle\langle\langle s,t\rangle,t\rangle,t\rangle}$
- $[\![\,[\,[\text{XP}]_{CT} \dots [\text{YP}]_{CT} \dots [\text{ZP}]_F\,]_{Decl}\,]\!]^{ct} \in D_{\langle\langle\langle s,t\rangle,t\rangle,t\rangle}$ } "set of sets of propositions"

- All CT-marked phrases get the same level of discourse scope

- Solution: F, CT_1, CT_2?

- $[\![\cdot]\!]^{ct_2} = $??
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5. The Topic Abstraction Account

○ Builds on previous work by Kadmon (2009), Tomioka (2010ab), Davis (2010), Wagner (2012)

Features of the Account

- Roothian 1996 framework for focus interpretation
- Squiggle ($\sim$) relates focus values to discourse anaphors
- No CT marks in the syntax
- CT phrase raises to CT operator position at LF

    $\sim$
    XP_F CT_i $\dots t_i \dots$
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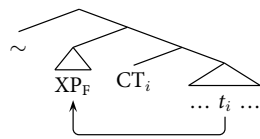
(22) **Contrastive Topic Abstraction**

    a. $[\![CT_i\ \alpha]\!]^o_g = \lambda x.[\![\alpha]\!]^o_{g[i\to x]}$ Ordinary Semantic Value

    b. $[\![CT_i\ \alpha]\!]^f_g = \{\lambda x.[\![\alpha]\!]^f_{g[i\to x]}\}$ Focus Semantic Value

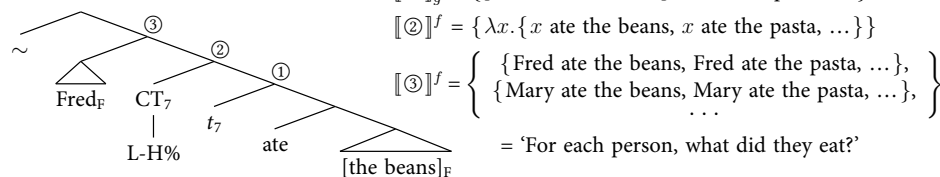(23) **Contrastive Topic Morphemes**

    a. English: CT = L-H%

    b. Mandarin: CT = _ne_

    c. Japanese: CT = _wa_ ?

○ CT Abstraction = Shan's (2004) and Novel and Romero's (2010) rejected predicate abstraction

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Complex Types → New Composition Rules?

- We now have functions to alternative sets, and nested alternative sets.
- Do these demand new composition rules?
- Let's assume only standard pointwise composition; everything else crashes.
- This will make some interesting predictions in the case of CT-marked quantifiers.
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(24) **CT + F:** "$[\text{Fred}]_{CT}$ ate $[\text{the beans}]_F$."

    $\sim$
    ③
    Fred_F CT_7 ② ①
    L-H% t_7 ate $[\text{the beans}]_F$

$[\![①]\!]^f_g = \{g(7)$ ate the beans, $g(7)$ ate the pasta, $\dots\}$

$[\![②]\!]^f = \{\lambda x.\{x$ ate the beans, x ate the pasta, $\dots\}\}$

$[\![③]\!]^f = \left\{\begin{array}{l}\{\text{Fred ate the beans, Fred ate the pasta, }\dots\}, \\ \{\text{Mary ate the beans, Mary ate the pasta, }\dots\}, \\ \qquad\qquad\qquad \cdots \end{array}\right\}$

= 'For each person, what did they eat?'

(25) **Rooth's Squiggle (Generalized)**

    a. $[\![\sim\phi]\!]^o = [\![\phi]\!]^o$

    b. $[\![\sim\phi]\!]^f = \{[\![\phi]\!]^o\}$

    c. Presupposes context contains antecedent C such that:

        i. $C \subseteq [\![\phi]\!]^f$

        ii. $|C| > 1$

        iii. $[\![\phi]\!]^o\ \boxed{*\in}\ C$ "C contains $[\![\phi]\!]^o$ **somewhere within it.**"

○ We now _derive_ Büring's CT-congruence condition via Rooth's more general squiggle!

○ Exactly what kind of antecedent is a set of questions?

○ A complex question / discourse strategy!

Sorted Multiple Wh- Questions

- Complex questions can denote _sorted_ meanings (Hagstrom 1998, Kadmon 2009)
- Languages may overtly mark different sortings of multiple wh- (Dayal 1996, 2006, Šimík 2010)
- Topic abstracting one wh- phrase generates sorted multiple wh- denotation (under Beck 2006; see Appendix C)
- Prediction: wh- phrase that we sort by will display features of topic (cf. Willis 2008)
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(26) **Lone CT:** "$[\text{Fred}]_{CT}$ ate the beans…"

    $\sim$
    ③
    Fred_F CT_7 ② ①
    L-H% t_7 ate the beans

$[\![③]\!]^f = \left\{\begin{array}{l}\{\text{Fred ate the beans}\} \\ \{\text{Mary ate the beans}\} \\ \qquad\qquad \cdots\end{array}\right\}$

= 'For each person, did they eat the beans?'
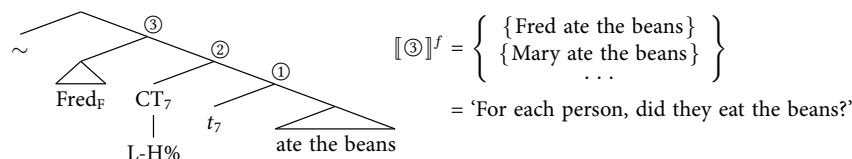
○ Singleton containing proposition = polar question (Büring 2003, Biezma and Rawlins 2011)
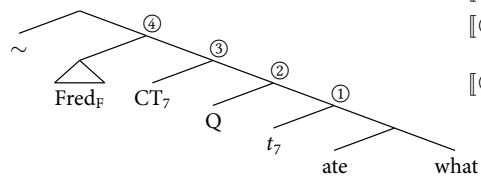

Phonology of CT

- L-H% spells out at intonational phrase boundary
- Following Féry (2007), avoid inducing IntP unless necessary (e.g. to prevent CT and F from sharing one IntP)
- Pitch accents within L-H% IntP are rising (L+H*)
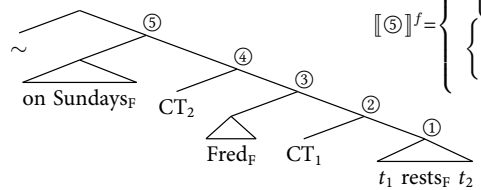---

(27) **Question Semantics (after Beck 2006)**

    a. $[\![\text{what}]\!]^o$ = undefined

    b. $[\![\text{what}]\!]^f = D_e$

    c. $[\![Q\ \phi]\!]^o = [\![\phi]\!]^f$

    d. $[\![Q\ \phi]\!]^f = [\![\phi]\!]^f$

(28) **CT Question**: "What did [Fred]$_{CT}$ eat?"

$$[\![①,②]\!]^f_g = \{\, g(7) \text{ ate beans, } g(7) \text{ ate pasta, } …\,\}$$

$$[\![③]\!]^f = \{\, \lambda x.\{x \text{ ate beans, } x \text{ ate pasta, } …\}\,\}$$

$$[\![④]\!]^f = \left\{ \begin{array}{l} \{\text{Fred ate beans, Fred ate pasta, } …\}, \\ \{\text{Mary ate beans, Mary ate pasta, } …\}, \\ \qquad\qquad\qquad … \end{array} \right\}$$

= 'For each person, what did they eat?'

(29) **Multiple CT**:
"On [Sundays]$_{CT}$, [Fred]$_{CT}$ [rests]$_F$."

$$[\![⑤]\!]^f = \left\{ \begin{array}{l} \left\{ \begin{array}{l} \{\text{Fred rests Sunday, Fred works Sunday, } …\}, \\ \{\text{Mary rests Sunday, Mary works Sunday, } …\}, \\ \qquad\qquad … \end{array} \right\} \\ \left\{ \begin{array}{l} \{\text{Fred rests Monday, Fred works Monday, } …\}, \\ \{\text{Mary rests Monday, Mary works Monday, } …\}, \\ \qquad\qquad … \end{array} \right\} \\ \qquad\qquad\qquad … \end{array} \right\}$$

= 'For each day…
   [For each person, what do they do]?'

(30) **Island-Internal CT**: "[Fred]$_{CT}$ and Mary get along…"
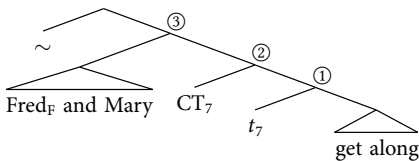
$$[\![③]\!]^f = \left\{ \begin{array}{l} \{\text{Fred and Mary get along}\} \\ \{\text{John and Mary get along}\} \\ \qquad\qquad … \end{array} \right\}$$

= 'For each person, do they and Mary get along?'

○ **Prediction**: No CT in island with F!

(31) **CT in Island; F outside Island**

I think [*Fred*]$_{CT}$ and Mary … would be [*good*]$_F$ teammates.

(32) **Both CT and F in Island**

(What about *Fred*? Who should we pair *him* with?)

a. ??I think [*Fred*]$_{CT}$ … and [*Mary*]$_F$ would be good teammates.
b.   I think [*Fred*]$_{CT}$ … would be a good teammate for [*Mary*]$_F$.

6. Conclusions

○ Topic abstraction provides simple mechanism for producing nested alternatives (cf. Büring's ct-values)
○ Rooth's squiggle ($\sim$) plays well with nested alternatives
○ The topic abstraction account handles CT questions, multiple CT and island data

| **Going further…**	
○ How are CT-marked quantifiers interpreted?	Appendix A
○ How are sorted wh- question meanings generated?	Appendix B
○ How does the account compare to Wagner 2012, Tomioka 2010b?	Appendices C–D

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Appendix A: CT Quantifiers

(33) $[\textit{All}]_{CT}$ politicians aren't corrupt… (not > all)

(34) **CT-marked quantifiers take narrow scope**
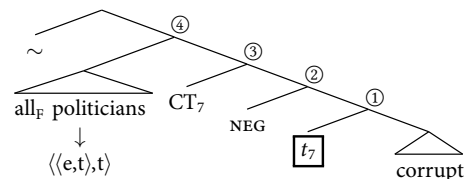
If trace is type e…

$[\![②]\!]_g^f = \{\, g(7) \text{ isn't corrupt} \,\}$

$[\![③]\!]^f = \{\, \lambda x.\{\, x \text{ isn't corrupt} \,\} \,\}$

$[\![④]\!]^f = \boxed{\textsc{Crash!}}$

If trace is type $\langle\langle e,t\rangle,t\rangle$…

$[\![②]\!]_g^f = \{\, \neg\,[g(7)](\lambda x.x \text{ is corrupt}) \,\}$

$[\![③]\!]^f = \{\, \lambda G_{\langle\langle e,t\rangle,t\rangle}\{\, \neg\,G(\lambda x.x \text{ is corrupt}) \,\} \,\}$

$[\![④]\!]^f = \{\, \{\, \neg\,G(\lambda x.x \text{ corrupt}) \,\} \mid G \in D_{\langle\langle e,t\rangle,t\rangle} \,\}$

$$= \left\{ \begin{array}{c} \{\text{All politicians are corrupt}\} \\ \{\text{Most politicians are corrupt}\} \\ \cdots \end{array} \right\}$$

Topic Abstraction vs. Quantifier Raising

○ QR affects scope relations by having GQ bind type-e trace.
○ Topic abstraction won't ever allow GQ to bind type-e trace. (Type Mismatch)
○ Thus, topic abstraction doesn't affect scope relations.

○ What about **wide-scope** quantificational topics?

(35) $[\textit{Some}]_{CT}$ students solved $[\textit{less than three}]_F$ problems.

    a. 'Less than three problems x are such that some students solved x.' (Obj$_F$ > Subj$_{CT}$)
       (Requires contextual support for contrasting proportions.)

    b. 'Some students x are such that x solved less than three problems.' (Subj$_{CT}$ > Obj$_F$)

○ Both readings generated if we allow intermediate scope positions…

(36) **Obj$_F$ > Subj$_{CT}$**   (37) **Subj$_{CT}$ > Obj$_F$**   (to be revised)
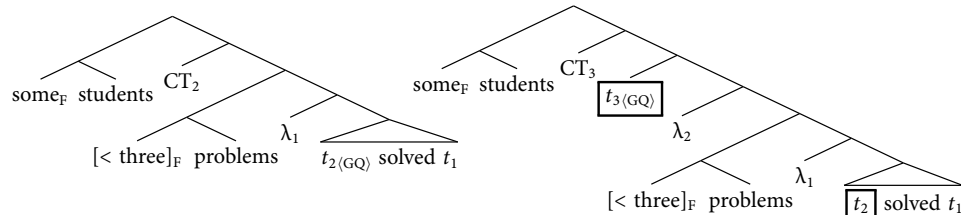
○ …but this predicts wide-scope options for *all* quantifiers!
○ In fact, quantifiers that allow wide-scope topic readings are only those that imply the existence of an individual or plurality in the "reference set" (restrictor ∩ scope).
○ These "witnessable" quantifiers are those that Reinhart (1997) argued allow type-e choice-functional readings, and that Rooth (2005) argued must be interpreted as type-e when CT-marked.

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(38) **Decreasing Quantifiers** (robustly GQ-denoting)

$[\textit{Few}]_{CT}$ students solved $[\textit{less than three}]_F$ problems.

    a. *'Few students x are such that x solved less than three problems.' (*Subj$_{CT}$ > Obj$_F$)

    b. 'Less than three problems x are such that few students solved x.' (Obj$_F$ > Subj$_{CT}$)
       (Requires contextual support for contrasting proportions.)

(39) **Contrasting Proportions**

Which problems did *all* students solve?
Which problems did *most* students solve?
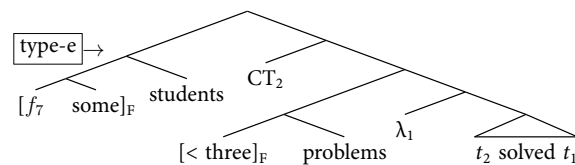Which problems did *few* students solve?

○ When a GQ is CT-marked:
    • it takes narrow scope
    • (proportional) GQ contrasts are evoked

Conclusion

○ Intermediate scope LF (37) ruled out.
○ QR and Topic Abstraction can't target the same phrase.
○ Or generally: One movement chain can't contain traces of two types.

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(40) **Subj$_{CT}$ > Obj$_F$**   (via choice function)


Principles of Topic-Abstraction

○ Type-e trace → contrasting individuals
○ GQ trace → contrasting proportions
○ CT-marked GQ's take narrow scope

Appendix B: Sorted Multiple Wh- Questions

○ Across many languages: (see Šimík 2010 and references therein)
    • "What did you buy where?" → 'For each thing, tell me where you bought it.'
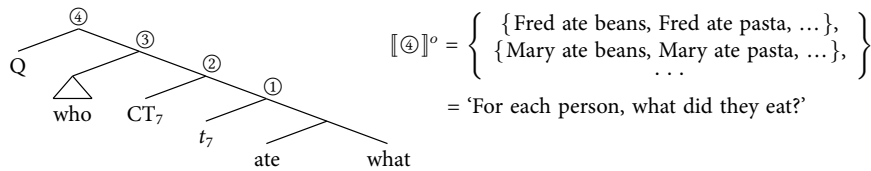   • "Where did you buy what?" → 'For each place, tell me what you bought there.'

(41) **Flat Multiple Wh- Question**: "Who ate what?"
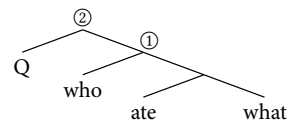
$[\![②]\!]^o = [\![①]\!]^f = \{\, \text{Fred ate beans, Mary ate pasta, …} \,\}$

$= $ 'What eater/eaten pairs were there?'

(42) **Sorted Multiple Wh- Question:** "[Who]$_{CT}$ ate what?"

$$\llbracket ④ \rrbracket^o = \left\{ \begin{array}{l} \{\text{Fred ate beans, Fred ate pasta, ...}\}, \\ \{\text{Mary ate beans, Mary ate pasta, ...}\}, \\ \qquad\qquad\qquad \cdots \end{array} \right\}$$

= 'For each person, what did they eat?'

Appendix C: Comparison with Wagner 2012

Overview of Wagner 2012

○ FOCUS operator presupposes salience of a question; see (43a.ii)
○ CT phrase is associate of *higher* of two FOCUS operators
○ Nested focus operators only allow surface scope
○ Lone CT and F+CT don't involve CT semantics!

(43) **FOCUS semantics** *modified from Wagner 2012*

    a. $\llbracket \text{XP FOCUS YP} \rrbracket^g_o = \llbracket \text{YP} \rrbracket^g_o(\llbracket \text{XP} \rrbracket^g)$, and is defined iff both

        (i) $\left| \llbracket \text{XP} \rrbracket^g_a \right| > 1$, and

        (ii) $\{ f(a) \mid a \in \llbracket \text{XP} \rrbracket^g_a, f \in \llbracket \text{YP} \rrbracket^g_a \}$ is salient.   (a question denotation)

    b. $\llbracket \text{XP FOCUS YP} \rrbracket^g_a = \{ f(a) \mid a \in \llbracket \text{XP} \rrbracket^g_a, f \in \llbracket \text{YP} \rrbracket^g_a \}$ (same question as (a.ii))

(44) a. $[\,Fred\,]_{CT}$ ... ate $[$ the *beans* $]_F$.
        L+H* L-H%   H* L-L%

    b. Fred$_F$ FOCUS λ_2 [the beans]$_F$ FOCUS λ_1 t_2 ate t_1

    c. Presupposes salience of two questions:

         $\{ \text{Fred ate } x \mid x \in D_e \}$ "What did Fred eat?"
         $\{ x \text{ ate } y \mid x \in D_e, y \in D_e \}$ "Who ate what?" (flat)

○ Similarities with my proposal:

    • CT phrase is associate of a focus operator; no CT marks in the syntax

    • CT phrase raises to spec of a focus operator at LF
        (Note: For Wagner (2006, 2012) *all* focus association is via movement)

    • Operator associating with CT phrase interpreted non-compositionally

Challenges for Wagner 2012

○ The Interface: CT marks associate of higher of two FOCUS operators?
○ CT Questions: Predicts no CT marking in simple (lone) CT questions.
○ Multiple CT: CT marks associate of *non-lowest* FOCUS operator?
○ Rise-Fall-Rise: Why does RFR sound like CT in English, Japanese, Mandarin, ... ?
○ Inverse Scope: "Even the *least* poisonous snake... would only frighten *Bill*." (only > even)

# Appendix D: Comparison with Tomioka 2010b

Overview of Tomioka 2010b

○ Woldian (1996) framework for selective focus binding
○ Exh operator binds exhaustive focus; alternatives are false
○ CT operator makes alternative speech acts salient
○ CT phrase is associate of CT operator that isn't bound by Exh

(45) **CT and Exh Semantics**   *Tomioka 2010b*

    a. $\llbracket \text{Exh}_i\ \alpha \rrbracket^g = \lambda w. \llbracket \alpha \rrbracket^g(w) = 1\ \&\ \forall p \in \text{NW}(p, \{ \llbracket \alpha \rrbracket^{g[i \to x]} \mid x \in D_\tau \}): p(w) = 0$

    b. $\llbracket \text{CT}_i\ \alpha \rrbracket^g = \{ \llbracket \alpha \rrbracket^{g[i \to x]} \mid x \in D_\tau \}$ "evokes alternative speech acts"

    c. $\text{NW}(p, S) = \{ q \mid q \in S \text{ and } p \not\subset q \}$ "propositions in S not weaker than p"

(46) a. $[\,Fred\,]_{CT}$ ... ate $[$ the *beans* $]_F$.
        L+H* L-H%   H* L-L%

    b. CT$_{1,2}$ Assert Exh$_3$ Fred$_1$ ate [the beans]$_{2,3}$
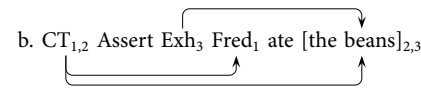
    c. Alternative speech acts: $\{$ assertion that x ate y, and nothing but $y \mid x, y \in D_e \}$

○ Similarities with my proposal:

    • CT phrase is associate of a focus operator; no CT marks in the syntax
    • Operator associating with CT phrase interpreted non-compositionally
    • CT predicted to occur across different types of speech act

Challenges for Tomioka 2010b

○ The Interface: CT marks those associates of CT operator that aren't bound by Exh?
○ Multiple CT: Evokes sets of *sets* of speech acts?
○ Exh Imperatives: (Don't go to *Toyko*...) Go to $[\,Kyoto\,]_F$!
○ Island Data: ??The painting that $[\,Mary\,]_{CT}$ ... drew of $[\,John\,]_F$ was the best.