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 (~)

- 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},
   \quad L+H^* \quad L-H^* \quad H^* \quad L-L^%

2. CT Resists Resolving Answers

   (Which train did they take?)
   a. \{ Most \}_{CT} of them … took the \{ early \}_{F} train.
   \quad L+H^* \quad L-H^* \quad H^* \quad L-L^%
   b. \# \{ All \}_{CT} of them … took the \{ early \}_{F} train.
   \quad L+H^* \quad L-H^* \quad H^* \quad L-L^%

3. F + CT

   A: What about the gazpacho and the ceviche? Who ate those?
   B: [Persephone]_{F} ate the [gazpacho]_{CT}.
   \quad H^* \quad L-L^% \quad L+H^* \quad 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…
   \quad L+H^* \quad L-H^%

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).

4. 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) \([Q]^{ct} \in [U]^{ct}\)

5. ct-Value Composition

   Büring (2003: 539)
   \[ [A]^{ct} = \begin{cases} \quad \text{if } A \text{ is F-marked,} & \{ D_{\text{type}(A)} \} \\ \text{otherwise, if } A \text{ is CT-marked,} & \{ \{ \alpha \} \mid \alpha \in D_{\text{type}(A)} \} \\ \text{otherwise, if } A \text{ is a terminal,} & \{ [A]^{ct} \} \\ \text{otherwise, if } A = [B], & [B]^{ct} \\ \text{otherwise, if } A = [B C], & \{ \beta \mid \exists b, c \in [B]^{ct} \& c \in [C]^{ct} \& \beta = \{ \alpha \mid \exists b', c' \in b \& c' \& c \& \alpha = b' + c' \} \} \end{cases} \]
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-bú-xiǎng jǐntiān 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-bú-xiǎng chī shuǐ-zhǔ-yú ne?
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? Kamalı 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?
Fred ate beans. Mary ate pasta.

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).
   L+H° L-H° L+H° L-H° L+H° L+H° L-H° L-H°
   { But Mary works (on Mondays). }
   "But on Mondays, he works."
b. Fred, on Sundays, he stays home. But on Mondays, he works.
   L+H° L-H° L+H° L-H° L-H° L+H° L-H°
   { But on Mondays, he works. }
   "But Mary works (on Sundays)."

(19) **Japanese Multiple CT wa**

Jon-wa Mearii-wa Biru-ni-wa shokkai-shi-ta. (Yabushita 2008)
John-CT Mary-CT Bill-to-CT introduction-do-PAST
'John_CT introduced Mary_CT to Bill_CT.'
Dholuo Multiple CT to

A: Whose vegetables do you like the best?

B: Buth Ochieng′ mit ahinya, to apodhe to ok a-hero. Awiti to odiede to a-hero, to omboke to ok a-hero. Awiti cactus. A: But his pumpkin is delicious, but his okra is not good. Awiti, her cactus, I like, but her amaranth I don't.

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

This will make some interesting predictions in the case of CT-marked quantifiers.

Singleton containing proposition = polar question (Büring 2003, Biezma and Rawlins 2011)

Rooth's Squiggle (Generalized)

a. \[\sim o^\alpha\] = \[\alpha\]^o
b. \[\sim o^\alpha\] = \{\[\alpha\]^o\}

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?

Problem for Büring 2003

\[\alpha\] is a set of sets of type \[\alpha\]^o

\[\{X^\alpha\}_\alpha\] ∈ \[D^\alpha\](\alpha, \alpha, 0, 0)

"set of sets of propositions"

- All CT-marked phrases get the same level of discourse scope
- Solution: F, CT(1), CT(2)?

\[\{\}\] = ??

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)

Lone CT: “[Fred] CT ate the beans…”

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

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.

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+)

Question Semantics (after Beck 2006)

a. \[what\]^o = undefined
b. \[what\]^f = D_x
c. \[Q\alpha\]^o = \[\alpha\]^f
d. \[Q\alpha\]^f = \[\alpha\]^f
(28) **CT Question:** "What did [Fred]CT eat?"

(29) **Multiple CT:**
"On [Sundays]CT, [Fred]CT [rests]."

(30) **Island-Internal CT:** "[Fred]CT and Mary get along..."

(31) **CT in Island; F outside Island**
I think [Frede]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 (~) plays well with nested alternatives
- The topic abstraction account handles CT questions, multiple CT and island data

<table>
<thead>
<tr>
<th>Going further...</th>
<th>Appendix A</th>
<th>Appendix B</th>
<th>Appendices C–D</th>
</tr>
</thead>
<tbody>
<tr>
<td>How are CT-marked quantifiers interpreted?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How are sorted wh-question meanings generated?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How does the account compare to Wagner 2012, Tomioka 2010b?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

References
Appendix A: CT Quantifiers

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

(34) CT-marked quantifiers take narrow scope

If trace is type e…
\[ \{ \mathcal{G}(t) \text{ isn't corrupt} \} \]
\[ \{ \mathcal{G}(x). \ x \text{ isn't corrupt} \} \]
\[ \{ \mathcal{G} = \text{CRASH!} \} \]

Intermediate scope LF (37) ruled out.

If trace is type (⟨g,t⟩,t)…
\[ \{ \mathcal{G}(g). (\lambda x. x \text{ is corrupt}) \} \]
\[ \{ \mathcal{G}(g) \ (\lambda x. x \text{ is corrupt}) \} \]
\[ \{ \mathcal{G}(g) \ (\lambda x. x \text{ is corrupt}) \} \]

\( \{ \text{All politicians are corrupt} \} \)
\( \{ \text{Most politicians are corrupt} \} \)

(35) [ Some ]_{CT} students solved [ less than three ]_{P} problems.

a. 'Less than three problems \( x \) are such that some students solved \( x \).

(Requires contextual support for contrasting proportions.)

b. 'Some students \( x \) are such that \( x \) solved less than three problems.'

(36) Obj_{P} > Subj_{CT} (to be revised)

(37) Subj_{CT} > Obj_{P}

(38) Decreasing Quantifiers (robustly GQ-denoting)

[ Few ]_{CT} students solved [ less than three ]_{P} problems.

a. * Few students \( x \) are such that \( x \) solved less than three problems.'

(\*Subj_{CT} > Obj_{P})

b. 'Less than three problems \( x \) are such that few students solved \( x \).

(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 QG is CT-marked:

- It takes narrow scope
- (proportional) GQ contrasts are evoked

(40) Subj_{CT} > Obj_{P} (via choice function)

(41) Flat Multiple Wh- Question: "Who ate what?"

\( \{ \mathcal{G}(\lambda t \_f \times) \} = \{ \text{Fred ate beans, Mary ate pasta, …} \} \)

= 'What eater/eaten pairs were there?'

Appendix B: Sorted Multiple Wh- Questions

- Across many languages: (see Šimuk 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.'
Sorted Multiple Wh- Question: "[Who]CT ate what?"

\[ \{ Fred \text{ ate beans, } Fred \text{ ate pasta, ... }, \} \]
\[ \{ Mary \text{ ate beans, } Mary \text{ ate pasta, ... } \} \]
\[ \ldots \]
\[ = \text{'For each person, what did they eat?' } \]

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!

FOCUS semantics (modified from Wagner 2012)

- \( \text{a. } [XP \text{ FOCUS } YP]^g = [YP]^g([XP]^g) \) and is defined iff both
  - (i) \( ||XP||^g > 1 \), and
  - (ii) \( \{ f(a) \mid a \in [XP]^g, f \in [YP]^g \} \) is salient.
- \( \text{b. } [XP \text{ FOCUS } YP]^g = \{ f(a) \mid a \in [XP]^g, f \in [YP]^g \} \)

Similarities with my proposal:
- CT phrase is associate of a focus operator; no CT marks in the syntax
- CT phrase raises spec of a focus operator at LF
- Operator associating with CT phrase interpreted non-compositionally

Challenges for Wagner 2012

- 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]!
- Island Data: ??The painting that [Mary]CT … drew of [John] was the best.

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

CT and Exh Semantics

- \( \text{a. } [\text{Exh}, \alpha]^g = \lambda w. [\alpha]^g(w) = 1 \land \forall p \in NW(p, [\alpha]^{g\rightarrow h} \mid x \in D_x) : p(w)=0 \)
- \( \text{b. } [\text{CT}, \alpha]^g = [\alpha]^{g\rightarrow h} \mid x \in D_x \) “evokes alternative speech acts”
- \( \text{c. } NW(p, S) = \{ q \mid q \in S \text{ and } p \not\subseteq q \} \) “propositions in S not weaker than p”

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]!
- Island Data: ??The painting that [Mary]CT … drew of [John] was the best.