Discourse subordination licenses
optional movement of D-linked *wh*-phrases

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- A bugbear in the syntax-information structure literature is the optionality of movement like topicalization (Szendrői 2017)
    - E.g. English contrastive topicalization (CT; Constant 2014)

(1)   a. The GAZPACHO$_{CT}$, Persephone brought…
       b. Persephone brought the GAZPACHO$_{CT}$…

- Movement of D-linked *wh*-phrases (DWh's) in multiple *wh*-questions also display optionality effects (e.g. Pesetsky 1987)

(2)   a. Which student$_{DWh}$ read which book$_{DWh}$?
       b. Which book$_{DWh}$ did which student$_{DWh}$ read?

- This talk argues that topicalization and movement of DWh's can be optional because of competition between forms of anaphora
    - In situ topics/DWh's act as regular discourse anaphors
    - Moved topics/DWh's mark *discourse subordination*
- The optionality is derived from competing economy and interpretive constraints
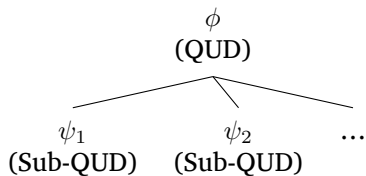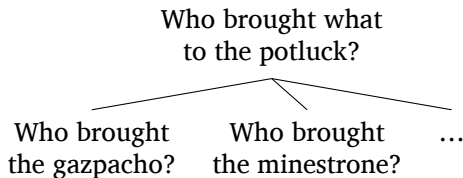
Outline

Introduction: QUD

- Consider ways in which continuation ψ can be a subpart of ϕ
- In the Question Under Discussion literature, a question ϕ can be elaborated upon via sub-questions (Roberts 1998)
    - Sub-questions address some subpart of the broader question
    - Inside a sub-question, the QUD is not completely answered
- Contrastive topicalization requires an anaphoric link inside a sub-question that contrasts with others (Constant 2014)

(a)

ϕ
(QUD)

ψ_1 ψ_2 ...
(Sub-QUD)   (Sub-QUD)

(b)

Who brought what
to the potluck?

Who brought   Who brought   ...
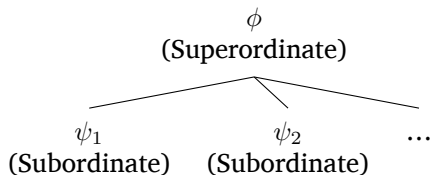the gazpacho?   the minestrone?

Introduction: Discourse subordination

- Discourse subordination (DS) does not require an open QUD or contrasting sub-questions
- Segmented Discourse Representation Theory (Asher & Lascarides 2003; Asher & Vieu 2005): One sentence is, roughly, a subevent of another
  - Elaboration & Explanation = subordinating
  - Narration, Contrast, Background = non-subordinating
- Grosz & Sidner (1986): One sentence is in the same focus space as another, leaves the prior sentence 'open' (using the term 'dominance'; cf. also Webber 1988)
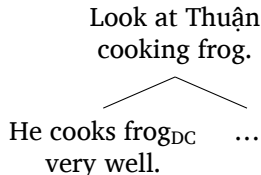
Introduction: Discourse subordination

- López (2009) analyzes Catalan clitic right-dislocation as anaphora with antecedents in a superordinate sentence
- Baclawski Jr. (2015) analyzes topicalization in Eastern Cham similarly, using the term *discourse connected* (DC)
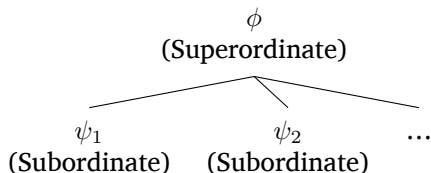
(a)

$$\phi$$
(Superordinate)

ψ_1 ψ_2 ...
(Subordinate)   (Subordinate)

(b)

Look at Thuận
cooking frog.

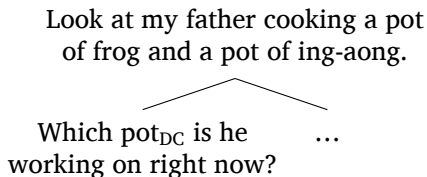He cooks frog$_{DC}$ ...
very well.

Introduction: DS, questions, and answers

- According to Segmented Discourse Representation Theory, answers to questions can have two forms:
  - Direct answers to questions (e.g. *Do you want to eat dinner? Yes.*)
  - Elaborating answers to questions, which are subordinating (e.g. *…I already ate dinner.*)
- Additionally, questions can have the same kinds of discourse relations as statements*
  - Elaboration vs. Elaboration$_q$, Narration vs. Narration$_q$

(a)

(b)

ϕ
(Superordinate)

Look at my father cooking a pot of frog and a pot of ing-aong.

ψ_1
(Subordinate)

ψ_2
(Subordinate)

…

Which pot$_{DC}$ is he working on right now?

…

Discourse connectedness in Eastern Cham

- Eastern Cham (Austronesian: Vietnam) is an SVO, *wh*-in situ language with little bound morphology
    - Examples in this section include a line of the romanization of Cham script ('Rumi') and traditional Cham IPA (Brunelle and Phú 2018)
    - Data was collected from 35 native speakers in Vietnam from 2015–2018, using semi-directed discourse elicitation
- Topics can optionally be moved to the left periphery

(3) a. *Nyu ngap ing-aong bingi ralo.*

ɲu   ŋă?   **ʔiŋ ʔɔŋ**   ŋːi   lo
3.ANIM   make   ing-aong   be.delicious   very

'He makes[cooks] ing-aong very well [LIT: deliciously].'

a′. *Ing-aong, nyu ngap bingi ralo.*

ʔiŋ ʔɔŋ   ɲu   ŋă?   ŋːi   lo
frog   3.ANIM   make   be.delicious   very

'He makes[cooks] frog very well [LIT: deliciously].'

Topicalization

- This optional movement is possible in subordinating (DS) contexts, such as Elaboration and Elaborating answers to questions

(4) a. CONTEXT: 'Look at Thuận cook ing-aong.'
   b. *Nyu ngap ing-aong bingi ralo.*

ɲu	ŋă?	**ʔiŋ ʔɔŋ**	ŋ:i	lo
3.ANIM	make	ing-aong	be.delicious	very

   'He makes[cooks] ing-aong very well [LIT: deliciously].'

   b′. *Ing-aong, nyu ngap bingi ralo.* 'He makes[cooks] frog very well.'

Topicalization

- The optionality goes away in the absence of DS, such as Narration, Background, and Direct answer contexts

(5) a. CONTEXT: 'Look at Thuận cook ing-aong.'

   b. *Sơn thau ngap ing-aong o.*

   sɤn thằw   ŋăʔ **ʔiŋ ʔɔŋ** o
   Sơn know.NEG make ing-aong NEG
   'Sơn does not know how to make[cook] frog.'

   b'. #*Ing-aong, Sơn thau ngap o.* 'Sơn does not know how to make[cook] frog.'

Topicalization

- In contrastive topic contexts, movement is generally disfavored. Instead, CT's are marked by the existential *hu* (Baclawski Jr. 2018)

(6) a. CONTEXT: 'Which person invited each of you to come here?'

 b. *Drei hu da-a Thuận mai pak ni...*

ɕ̥ěj hu ʔa **thɥ̀ən** maj pǎʔ ni...
self EXIST invite Thuận come in this

B: 'I[myself] invited Thuận$_{CT}$ to come here...'

 b′. #***Thuận**, drei hu da-a mai pak ni...*

- Thus, we conclude that Eastern Cham moved topics must be DC
- In other words, moved topics must be anaphora such that the antecedent's sentence discourse subordinates the anaphor's sentence

Movement of *wh*-phrases

- *Wh*-phrases can optionally be moved in DS contexts, again like Elaboration and Explanation
- However, the optionality disappears in Narration or Background contexts (in situ versions omitted for space)

(7) a. CONTEXT: 'Look at my father boil one pot of ing-aong and one pot of frog.'

   b. *Urak ni, gaok hagait ong nan daok ngap nan?*

ja ni	ḳɔʔ ḳɛɪt	oŋ	năn	tɔʔ	ŋăʔ	năn
now	pot what	old.man	that	PROG	make	that

   'Now, what pot is that old man making [working on]?'

   b″. #*Urak ni, gaok hagait ong nan daok mbeng nan?*

#ja ni	ḳɔʔ ḳɛɪt	oŋ	năn	tɔʔ	ɓăŋ	năn
now	pot what	old.man	that	PROG	eat	that

   'Now, what pot is that old man eating?'

- We conclude that moved *wh*-phrases must also be DC

Movement of *wh*-phrases

- DC (i.e. moved) *wh*-phrases share certain properties with D-linking (Pesetsky 1987)
  - They denote sets that are saliently shared by the speaker and addressee (Comorovski 1996)
  - They are infelicitous out of the blue, except when a certain amount of context can be coerced
  - So-called 'aggressively non-D-linked' *wh*-phrases cannot be moved (8)
  - However, *what X* and bare *wh*-phrases ('who', 'what') appear to be more easily moveable than in English

(8)   a.   *Hâ daok ngap hanruai hagait?*

        hɨ   t̪ɔʔ   ŋăʔ   {**mɓroj ḳɛ**}

        2SG   PROG   do   crazy   what

        'What the hell are you doing?

   b.   **Hanruai hagait, hâ daok ngap?* 'What the hell are you doing?'

Optionality as anaphora competition

- In all the examples so far, topics and *wh*-phrases can optionally remain in situ. Why would a speaker choose movement at all?
- We analyze this optionality in terms of anaphora competition, which is well known to give rise to optionality and has recently been framed in terms of competing constraints (e.g. Patel-Grosz & Grosz 2017)

Economy

- DC-movement involves something extra (whatever drives movement, such as additional structure)
- Patel-Grosz & Grosz (2017) propose a constraint for different sizes of pronouns, *Minimize DP!*, that penalizes extraneous syntactic structure when less could have been used
- An economy constraint along these lines would always favor in situ anaphora:
    - In situ anaphor $\gg$ DC-moved anaphor

Optionality as anaphora competition

Discourse coherence

- We posit an interpretive constraint: *Maximize Discourse Coherence!*
- Asher & Lascarides (2003) propose Maximise Discourse Coherence as a (scalar) maxim of discourse interpretation: (Not identical to discourse coherence in the sense of Hobbs 1985)
- All things equal, a hearer interprets a discourse with the most:
  - Anaphoric links
  - Discourse relations (among other things)
- Marking a phrase as DC not only indicates an anaphoric relation, but also a subordinating discourse relation
- Therefore, DC-marking increases discourse coherence:
  - DC-moved anaphor $\gg$ In situ anaphor

Optionality as anaphora competition

- Optionality, thus, can be attributed to competing economy and discourse coherence constraints
  - **Economy constraint**: In situ anaphor $\gg$ DC-moved anaphor
  - **Interpretive constraint**: DC-moved anaphor $\gg$ In situ anaphor
- The optionality is always present, because the discourse is presumably interpretable either way
- The most obligatory instances of DC-movement we have involve hanging topics or reduced prior utterances:

(9) *Dalam limâ abaoh kayau pak ni, abaoh hagait ayut âng mbeng?*

l:am m:ɨ pɔh z:aw pǎʔ ni$_i$ pɔh k̥ɛɪt$_i$ zut ɨŋ ɓǎŋ

in 5 fruit here CLF what friend want eat

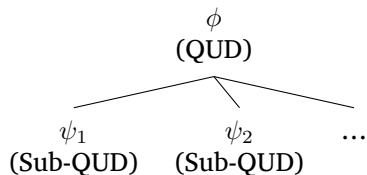'Of the 5 fruits here, what fruit do you[friend] want to eat?'

English optional movement: CT

- Is English like Eastern Cham?
  - No.
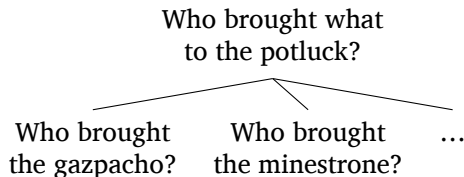 - But, contrastive topicalization is optional

(10) a. The GAZPACHO$_{CT}$, Persephone brought...
      b. Persephone brought the GAZPACHO$_{CT}$...

- And sub-questions in the sense of Büring (2003) and Constant (2014) have similarities to DC: elaborating answers to questions
- Perhaps, an analysis could be defended where CT's involve discourse connectedness within a QUD

(a)

(b)

ϕ
(QUD)

ψ_1 ψ_2 ...
(Sub-QUD)   (Sub-QUD)

Who brought what
to the potluck?

Who brought   Who brought   ...
the gazpacho?   the minestrone?

English optional movement: Multiple *wh*-questions

- Multiple *wh*-questions also display optionality when it comes to D-linking

(11)   a. Which student$_{DWh}$ read which book$_{DWh}$?
        b. Which book$_{DWh}$ did which student$_{DWh}$ read?

- Comorovski (1996) demonstrates that a prior utterance can seed the relative D-linking of a multiple *wh*-question
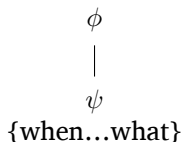 - (Comorovski 1996 rates left version of (c) as infelicitous)

(12)   a. It's nice to be so busy, but {when are you doing what? / #what are you doing when?}
        b. It's nice to have all those times scheduled, but {when are you doing what / #what are you doing when?}
        c. It's nice to have all those activities ahead of you, but {when are you doing what / what are you doing when?}

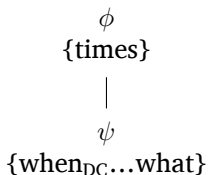# English optional movement: Multiple *wh*-questions

- Perhaps the optionality of (c) arises from competition between the unmarked default and DC-marking of the object
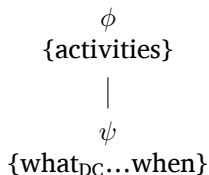
Figure: Perhaps:

(a) Default	(b) DC subject	(c) DC object
ϕ	ϕ {times}	ϕ {activities}
ψ {when…what}	ψ {when$_{DC}$…what}	ψ {what$_{DC}$…when}

Preliminary experiment on English D-linking

- But what about two DWh's?
- We tested whether a subordinating utterance like ϕ can influence the order of two DWh's in ψ:
- If so, this could reveal a lurking sensitivity to discourse connectedness

(a)

ϕ
{Y}

|

ψ
which Y...which X

(b)

ϕ
{X}

|

ψ
which X...which Y

Design

- 50 participants on Amazon Mechanical Turk were given mini discourses (in addition to filler and attention checks)
- They were asked to complete discourses given a binary choice:

Task 1

(13) a. I gave a list of 20 books to 20 students last week.
      b. The students/The books…   (Elaboration)
      c. {**Which student picked which book?** /
         Which book did which student pick?}

(14) a. I gave a list of 20 books to 20 students last week.
      b. As a background, the students/the books…   (Background)
      c. {Which student picked which book? /
         Which book did which student pick?}

- Factors: Background vs. Elaboration, Antecedent in (b)
- Prediction: Interaction between Elaboration and Antecedent

Task 1: Preliminary results

- There was an overall preference for SO ordering (81%, n = 213), but OS ordering does appear
- Unexpectedly, SO ordering is chosen significantly more often in the Elaboration contexts, regardless of the antecedent in (b) ($\beta = 0.9068$, $p < 0.05$)
- No other significant results

(15)   a. I gave a list of 20 books to 20 students last week.
       b. The students/the books...
       c. Which student picked which book?

Task 2

- Perhaps there is a general dispreference for OS order
- Task 2 asks participants to fill in the (b) sentence
- Here, the converse predictions are made, that the moved DWh correlate with the referent in (b)

(16)   a. I gave a list of 20 books to 20 students last week.
        b. {The students finally made their choices. /
           The books were finally chosen.}
        c. Which book did which student pick?

Task 2: Preliminary results

- The two types of (b) sentences were chosen about half the time (53/47%)
- Again, unexpectedly, the subject sentence was chosen significantly more often under Elaboration, regardless of the order in (c) ($\beta = 2.2137$, $p < 0.001$)

(17)   a. I gave a list of 20 books to 20 students last week.
        b. The students…
        c. Which student picked which book/
           Which book did which student pick?

- These results clearly do not support a discourse connectedness approach to multiple DWh-movement in English
- But more careful study is needed, starting with Comorovski's specific contexts (*when…what*)

Conclusion

- Discourse connectedness gives us a way to account for optional syntactic movement that is usually attributed to information structure
- Instead, the optionality is framed in terms of competition between forms of anaphora
  - DC has a structural cost, but it increases discourse coherence
- DC can account for topicalization and optional *wh*-movement in Eastern Cham, but its application to English is less clear

Thank you!

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