Cue Phrases in Spoken Language: Discourse Pragmatics at the Forefront

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Introduction
- Aim: Model discourse for speech applications
- Application: Generate and interpret prosody
  → Topic structure (interessential)
  → Information structure (intrasential)
- Question: How can we use cue phrases, topic and information structure to understand discourse structure on large datasets?

Cue phrases: Speech vs Text
- Discourse markers are very frequent in speech
  → e.g. yeah, so, well, I mean, you know...
- Pragmatically oriented discourse markers dominate spoken language
- Compare with PDTB explicit connectives:
- Rhetorical/semantic structure runs concurrently with pragmatic structure.
  → Model via Questions Under Discussion

Discourse structure, questions, and topics

Q1: Did you have a sense coming in that the anti-Sikh riot was picking up steam?
Q2: Were the offices of the Daily Color cheating with every ya he shot out on the house floor?

E: Well, you know, first of all you have to remember a couple things.

One, journalists, even center right journalists, are very skeptical and cynical.
So, I think everybody was skeptical that anything was going to happen.

On the other hand, you're reading for the story quality

I mean everybody is sort of reading contingency

not that you have a stake in it

certainly

but wouldn't be as great if it came close, right?

that would be fun to write about

Q2: Were the offices of the Daily Color cheating with every ya he shot out on the house floor?

Indirect answer background

E: Well, you know, first of all you have to remember a couple things.

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Questions Under Discussion

Q1: Did you have a sense the anti-Sikh riot was picking up steam?
Q2: Were the offices of the Daily Color cheating with every ya he shot out on the house floor?

Indirect: Q: What needs to be foregrounded before an answer?
Q: What are the relevant properties of the Daily Color journalists?
Q: What journalists like?
A: Journalists are skeptical and cynical.
Q: Why is this relevant?
A: Everyone was skeptical that anything was going to happen.
Q: How do the journalists feel about the story?
A: Everybody is rooting for the story.
Q: Why are they rooting for the story?
A: Do they have a stake in the story?
A: No.
Q: What journalists like?
A: Journalists are skeptical and cynical.
Q: Why is this relevant?
A: Everyone was skeptical that anything was going to happen.
Q: How do the journalists feel about the story?
A: Everybody is rooting for the story.
Q: Why are they rooting for the story?
A: Do they have a stake in the story?
A: No.

Rhetorical relations?
Via the QUD stack, we see:

- Introduction of new topics:
  → Co-ordinating, paratactic relations
  → e.g. Narrative, closing off a subquestion branch

- Questions about an existing topic
  → Sub-ordinating, hypotactic relations
  → e.g. Elaboration, what about this aspect of X?

- Inference/summary questions
  → e.g. Contingency: why?, how does it relate?
  → e.g. ‘So’ pops the question stack?

QUD and topics

- QUD indicates Information Structure:
  → What to update: discourse topic/theme
  → How to update: new info/theme, link

- QUD + IS + cue phrases provides useful detail on hierarchical relations and rhetorical discourse structure.

- However, large scale manual QUD annotation is not really feasible.

Q: What tools can we use to advance this?
  → Discourse topic → topic modelling?

Cues phrases and topic shifts

Q: Do cue words pattern consistently around topic shifts?

Position in paragraph: Manual breaks vs LDA-TextTiling
1365 TED talks, 20 cue words from Hirschberg & Litman (1994)

A: Well, it's clearer for manual paragraph breaks!
  so, now we focus: structural indicators
  → because, or → last → semantic connectives

However, incorrect predicted topic shifts often seem plausible...

Need to investigate:
- Reliability of segmentations,
- Relationship with audiovisual cues, e.g. prosody.

→ Finer grained topic segmentation and integration with update semantics is needed.

Ongoing work
- Predict prosodic changes from topic features and cue phrases and vice-versa.
- Investigate span of cue phrase arguments
- Integrate outputs of semantic parses, e.g. AMR
- Manual validation...