Lecture 6: discourse phenomena hinting at structure [write this last]

No class next Tuesday

I handout

Last lecture (Tuesday), we talked about online conversations, an obvious form of language-based social interaction.

For the next couple of lectures, we'll be briefly introducing some of the classic work on understanding the structure of conversations and other discourse.

"coherent structurally-grouped sentences [Jurafsky; Martin textbook]

- monologues; conversations.

The high-level bit is that there is a tremendous amount going on behind the scenes when you speak or listen 'naturally'.

[Note: some will be mostly not-currently fully-implemented,]

for reasons that will rapidly become obvious.

But I still want to present this material b/c I think it's fundamental to understanding discourse and I think this stuff may represent big opportunities for future systems.

(5) "rules" of conversation [not our focus]

I just want to quickly mention some important related work, that's interesting but not what I want to focus on.

You may have intuitions about how conversations are supposed to go.

Like, if someone asks you a question, you're not supposed to leave it hanging, but instead at least acknowledge it.

But there are also subtler 'rules' that seem to influence how we say things and how they'll be interpreted.
example: Grice's [1975, 1978] maxims (theory of conversational implicature) developed as part of his

'maxim of quantity': <see handout #1>

I put in there a recent Google-plus post regarding the accepted papers at NIPS (a machine learning conference) "impressed that Michael Jordan has five papers."

Then there's a comment by the original poster as follow-up. Why is the OP making this comment? What do they have to "apologize" for?

... the post => exactly five; that's the inference we draw.

'maxim of relevance': be relevant.

[Rogers; Norton 2011]: "artful dodgers": political scientists exploring the strategy "Don't answer the question you were asked; answer the question you wish you were asked." (McNamara) Robert

people who answer experiment: same q, two groups of respondents

one answered the q, but not very fluently other gave an off-topic answer that was fluent I eval'd: more highly

That's all quite cool, but let's now turn to sth. else (a) structure of conversation ** what I want to focus on

[A] excursion into pronominal anaphora: pronouns referring to a referent entity - demonstrates a way to infer hidden structure in language

so let's talk about how people determine what a pronoun refers to - since that's surely part of figuring out what someone is talking about.
starting w/ a very simple example

(a) Jill blames herself.  (clearly, 'herself' is Jill)

/*'herself'*/

syntactically unacceptable
(assuming Jill is♀. No *if Jill is♂)

so, gender and other features have to match.
Fine, but that's not structural.

(b) Jill thinks Bob blames himself  (student proposed: it's who
lightly the subject of the verb
that's misused)

* This is not a legal sentence.

What's wrong? In (a) 'herself' was allowed to refer to
'Jill'.

But w/ here, for some reason it seems like the
only possible referent for 'herself' is Bob, which
doesn't match gender-wise.

So, maybe there's a locality constraint.

locality constraint?

Two counterexamples (?):

"Jill thinks Bob blames her" is ok, not local.

non-reflexive pronoun
maybe there's a different rule.

(Indeed, w/ (a) you couldn't have
"Jill blames her")

(c) Bob confronted Bill all by himself.
confronted w/ these examples, we might say, oh, there's no structural explanation here.

but, if we're feeling brave in the way that I'd like to encourage you in this class to be brave, we could say, well, our theory of locality was working pretty well before evil example (c) came along.

So, let's try to fix, or extend, or refine our notion of locality.

back to above illustration:

Bob [confronted Bill][all by himself]

if we imagine that "all by himself" is "close" to Bob and somehow 'proximated' from Bill, then 'Bob' starts seeming like a nearby target again.

binding-theory solution; given parse tree,

the referent non-phrase is not on an an ancestor of the reflexive pronoun, but its parent has reflexive as descendant.

metapoint: some observations about anaphora resolution yield theories of hidden sentential structure.

w/ that as warm-up, let's now move beyond a single sentence.

(B) discourse structure, using some style of analysis.
The example on your handout are a little contrived. We wanted to have as little
as possible change between different variants, whereas in real life there are
often many redundant signals.

So, just bear with me.

Again using pronouns as a probe...

2(a) it: the book & vs. 2(b), which differs only by an 'anyway'

"it" more likely to be theory.

So, the single word 'anyway' is changing how we understand the
structure of this discourse.

Whereas now look @: 2(c)

2(c) mixes 2(a) with an extra line

"they" = quarks

"they've" = quarks

but it seems weird. Can try to then claim LS: "it" is "theory" but it would have - or alternatively
in LN say: 'oh by the way back to what I was
saying'.

Example #3 on handout,

- "it" is @ first blush the wine, despite semantic constraints
  (wine could perhaps be brown
  maybe "brown" is one of those wine words, like "oaky"
  and the fact that there's a semantically valid possible referent
  much closer - the table.

=> more evidence for hidden structure that can override strong
  "world-knowledge" constraints.
1. Gricean maxim of quantity at work (“‘Be exactly as informative as required’”).

https://plus.google.com/112461005502186454902/posts/EVvcG719D11

2. Adapted from Sidner [1979].

2(a)
1. Albert is a nice guy but a little clueless.
2. He told me he was sending me a book, but he sent it by surface mail.
3. It was actually a pretty interesting book —
4. apparently there’s a weird new theory involving “sideways” quarks.
5. Anyway, I finally got it about two weeks ago.

2(b)
1. Albert is a nice guy but a little clueless.
2. He told me he was sending me a book, but he sent it by surface mail.
3. It was actually a pretty interesting book —
4. apparently there’s a weird new theory involving “sideways” quarks.
5. I finally got it about two weeks ago.

2(c)
1. Albert is a nice guy but a little clueless.
2. He told me he was sending me a book, but he sent it by surface mail.
3. It was actually a pretty interesting book —
4. apparently there’s a weird new theory involving “sideways” quarks.
5. Anyway, I finally got it about two weeks ago.
6. They’ve been fundamental to understanding the “new relativity”.


4. Credited by Grosz and Sidner (1986) to Polanyi and Scha “forthcoming”, although the published versions of Polanyi and Scha that I was able to find give a similar but longer discourse.
   a. John came by and left the groceries.
   b. Stop that you kids.
   c. And I put them away after he left.

   A: Do you know when the train to Boston leaves?
   B: Yes.
   A: I want to know when the train to Boston leaves.
   B: I understand.

References


Graeme Hirst. Anaphora in Natural Language Understanding. Lecture notes in computer science 119. Berlin: Springer-Verlag, 1981. URL http://www.springerlink.com/content/t82712u28641/?p=bac5b25c10964abd9533ec7ce3b2e0eb&amp;amp;pi=
