

The Grosz-Sidner (86) theory. Discourse { beyond what ~~conversations~~ "look like" "rules" of conversation }  
(as hardat says, intentions & attention are key aspects)

put ref to centering on prior lecture,

### Outline

~~Review~~  
~~Review #~~

Review 1  
~~#~~

- I(c),(d) = a 'segment' that's 'weird' to refer to in I(f), "b/c" of "Anyway" in I(e)
- segments look topic-based

- segments (topic)
- relations btwn segments (incoherence if not related)

but 2: switch in topic (indicate by "then")  
incoherent ~~etc~~  
but not unnatural.

as our "lens"  
(again pronouns/b which act diff. in other langs, but main points about structure should still hold.)

interruptions are important to recognize  
listeners (humans or systems) must recognize (attend to ~~and adapt to~~) interruptions and possibly act on

3

~~(topic) topic is not enough: intentions~~  
recognizing intentions is key.

~~q's that can~~

q's/discussion that came up:

- is there a separate tree that's ~~part of~~ associated w/ the discourse + individual trees in people's heads?
- can analysis be done in one pass? (i.e., online?)
  - perspective: participant
  - probably often not: as we listen further, we realize our initial interpretation is wrong.

For example, @ the 1b-1c interface: is 1b the end of a segment (purpose), or is 1c corresponding to a delimited DSP? STOUND WE POP FSZ??

- perspective: analyst:
  - probably not, altho' "easier" conversations would make it so.

• can we really "recognize" a DSP or its fulfillment?

- Grice's maxim of relevance might be related to our ~~own~~ attempts to fit things into the intention tree.

• is bystander intervention related to mutual knowledge?

• recognizing whether sth is a rhetorical q or not.

DSP1: tell you about Albert being nice but cheeky

? DSP2: tell you that the book was interesting? Or talking about the book?

... what about informing you that the book was late?

⊕ in 'real life', there are non-textual cues to help w/ interpreting structure: think of how in email misunderstandings are more likely to arise.

Detailed notes in the FA13 version (next pages)

q: is 'apparently' a discourse cue, or a "content item" in 1(d)?

Lecture 7:

The Grosz/Sidner theory of discourse structure

[copies of handout from last time]

• A2 printout: the Kasparov diag for annotation

[load up the Youtube intentions video?]

no class Tues.

<start w/ screen ~~IP~~  
but @ laptop display on.

? lessons learned from pilot studies?  
(no time, most likely)

add to prior notes;  
'actually' in quotes

Last lecture we looked @ some suggestive discourse examples that provided evidence of hidden structure.

I want to remind you of this one: used anaphora resolution as lens

#2(a): lines 3-4: <project on board>

skip centering as being a theory of local structure (pairwise relationships)

Centering is presumably the phenom. behind 'brown & round' discourse

@ first, start off describing segments as topic-based

segment  
talking about the contents of the book

1. Albert...

talking about Albert

2. He | book

(next sentence could be about Albert or about the book's arrival)

3. actually

4. Anyway ... it

5. They've

6. They've

signal of return to prior topic

signals entry into new topic?

(why does speaker bother?)

(unless "it" or "it" in 5 is "theory"?)

=quarks, (only plural referent) but 'sounds funny' to be referring to that prior segment - "inaccessible"

~~any~~ <any other observations from class?>

(ask A. to repeat from last time)

see paper on describing 'so' as discourse marker, although broader citation better for webpage? ]

So ~~what we're observing here~~  
two ~~points~~ <sup>concepts</sup> arising here:

- existence of discourse segments
- incoherence when expected segment structure violated

↓  
Now, before ~~we~~ I kind of argued that you wouldn't expect to see a discourse like 2c in real life.

~~So you might conceive of 'incoherence' as an acceptance criterion~~

~~But incoherent~~

But incoherent discourses happen all the time in real life!

And actually, they are not always a bad thing at all.

Consider #4 on handout. I'm picking at this particular incoherent ~~discourse~~ discourse due to the pedagogical point I'm driving @.

- incoherent, b/c (b) → an interruption

(and it is an interruption, e.g.  
(or alternatively the interleaving of two conversations).

s.w. "them" would refer to the "kids",

(although maybe if the kids are badly enough behaved, you would want to put the kids away).

- incoherent, but normal  
→ important to be, in this case.
- speaker wants [~~in some sense~~] to be incoherent.

If the kids are ~~busy~~ about to microwave the new puppy, the speaker does not want to wait to finish their gripping tale of the Sage of the Groceries before telling the kids to knock it off.

→ ~~to~~ listeners (humans or systems) must recognize (; adapt to) incoherence.

In this case, presumably the speaker gives a lot of cues that the listener can pick up on: turning, change in volume,



So, two points so far that a theory of global discourse structure should take into account:

- <sup>existence of</sup> structural units or segments
- coherence; incoherence (maybe amounts to understanding the relations btwn segments).

Now, one more thought-provoking discourse example, this one involving 2 people (finally).

#5. one assu @

or actually, once you read it, it seems more like one human being and one ~~slight~~ somewhat flawed AI system.

<read>

• clearly this is a conversation going off the rails.  
[bulletproof glass joke from Grishman?]

What's the problem?

B's responses are, from some perspective, totally rational:

answer to 1<sup>st</sup> q is truthful

and second utterance by A isn't a q, so B doesn't technically have to do anything,

but B acknowledges A ~~anyway~~ anyway, which is nice; polite.

Crucially, though, B is failing to recognize A's ~~own~~ intentions when making these stunts, and that failure to take attention into account is causing all sorts of hard feelings, one presumes.

So: ~~third elt. the in~~

third elt: importance of recognizing intentions.

After all, perhaps the most important thing to note about conversations is that people ~~test~~ & generally have them for a ~~real~~ reason, (even if those reasons aren't very good).

Grosz; Sidner [1986] theory: ~~has~~ has really influenced my thinking when I pay attention to daily conversation.

primary atoms: discourse segment purpose (DSP)

- a single intention, the recognition of which motivates the discourse segment.

↑  
quick to use phrasing that is culturally specific?

ex in 5: DSP = find out the time

≠ check that B knows the time; ≠ test an AI system (even if true)

this explains why A continues the conversation, and does so by repeating the point a re. time. they're doing another attempt to get their intent recognized.

~~DSP relates~~ relations b/w DSPs : DSP1 dominates DSP2 if satisfying DSP2 furthers DSP1.

minimal set of  
contrast w/ more rhetoric-based theories like "elaboration", "evidence", "contrast", which are more about the discourse segments rather than the DSPs.

this kind of relation naturally suggests a tree.

ex: [Traafsky; Martin] (from back in the day when people called travel agents)

DSP1: caller: agent books flight

DSP2: a: c gives departure

DSP3: a: c gives destination

DSP4: a: c explains which "Ithaca".

note: a 'coherent' conversation could be 'incoherent' w.r.t. participants.

Should coherence be a property of the conversation mutually, or the participants individually?  
~~note that both parties~~

note that the intentions of both parties are in the tree.

~~It's~~

also note that this structure is a property of the joint conversation, not ~~of~~ necessarily the viewpoint that either participant themselves has.

So the fact that overt agendas are what's interesting makes a lot of sense;

you get the same structure whether or not the caller is a valid customer or, say, someone from a rival company that's trying to tie up the phone line.

DSP tree structure => embedded discourse segments.

with/ w/in the DS for DSP3 is a ~~sub~~ DS for the disambig.

But none of this theory so far explains why some referents seem to somehow disappear.

How to account for?

Well, parse trees relate to pushdown automata, so it's ~~useful~~ to think of trees being related to stacks, (semi-)natural

Q re: why does co-pilot speak indirectly to pilot, who outranks them, as opposed to saying directly what they mean? ('a storm is brewing, not "don't steer that way".')  
- foreshadows, a bit, the Pinker video: it can't be "at them" mutually that the dominance hierarchy is being challenged.

## attentional component:

conversation has a stack of focus spaces, one per discourse segment.

contains DSP: salient entities

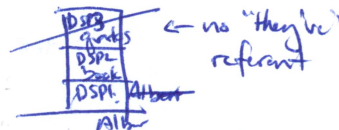
- draw a segment with so people know what to do on A2.

pop. f.s. when DSP is recognized/realized.

orders possible referents

explains why there are "missing" (or "inconvenient") referents, like "the theory" disappearing.

ease cognitive load by reducing the # of possible referents you have to look for



g: how deep can people's stacks be?

(talk about Walker's queue theory)

g: do parts of trees stay around beyond boundary of the conversation (i.e., over multiple days)?

It's probably true that tree intentions last across sessions, and shared culture keeps some always 'at the bottom of the stack'.

- incoherence: stack doesn't match the tree.

## Some implications:

~~hearsers~~ m

hearsers must ack. understanding of DSP for speaker to be satisfied.

("closure": Clark '96, ~~Clark~~ '88).

- ack can consist of attention

(if I keep staring @ you after I've told me what time

it is, this seems weird)

(if you don't look @ me while I'm trying to convey a complex point...)

- speakers can close segments w/ acts (thanks, great)

- ~~hearsers~~ can provide next expected contribution (disclaim a compliment, to show you know it was just meant to be polite).

- paraphrasing or repeating

Q: if it's all about getting your DSP recognized, why don't people just 'say what they mean'?

A: b/c there are other ~~related~~ factors (and hence intentions) @ play also controlling phrasing.

ex: status, ~~and~~ common knowledge

< show youtube video - From youtube directly! Better hand. idk >