
Foundations of Natural Language Processing

Lecture 19a

Discourse Coherence

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Making sense of actions



Changing our minds



Observing Action

- We assume action choice isn't arbitrary; choice is informed by the context
- So we infer more than we see.
- And may change these inferences as we see more.

Coherence in Discourse: Making sense of verbal actions



It's a beautiful night.
We're looking for something dumb to do.
Hey baby, I think I wanna marry you.

Questions

Coherence and Content

Representation: How should discourse coherence be represented formally and computationally?

Construction: What inference processes, and what knowledge sources, are used when **identifying coherence relations**?

Outline

- Motivation for discourse coherence
- Representing discourse coherence
- Inferring discourse coherence

Pronouns

From Hobbs (1985)

John can open Bill's safe.
He knows the combination

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John can open Bill's safe.

John ~~He~~ knows the combination.

- If “He” is John: **Explanation** (“because”).

Pronouns

From Hobbs (1985)

John can open Bill's safe.

Bill ~~He~~ knows the combination.

- If “He” is John: **Explanation** (“because”).
If “He” is Bill: at best we infer **Continuation** (“and”) with a very vague topic.

Pronouns

From Hobbs (1985)

John can open Bill's safe.

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Pronouns

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John can open Bill's safe.

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- If “He” is Bill: **Result** (“so”)
If “He” is John: a ‘weaker’ **Result**?
- Subjects are more likely antecedents, but not here...

Pronouns and Coherence

- Pronouns interpreted in a way that maximises coherence, even if this conflicts with predictions from other knowledge sources!

Coherence and Time

Max fell. John helped him up.

Max fell. John pushed him.

Coherence and Time

John hit Max on the back of his neck.

Max fell. John pushed him.

Max rolled over the edge of the cliff.

Word Meaning

A: Did you buy the apartment?

B: Yes, but we rented it./ No, but we rented it.

Bridging

John took an engine from Avon to Dansville.
He picked up a boxcar./He also took a boxcar.

Discourse Coherence and Implicit Agreement

From Sacks *et al.* (1974):

- (1)
 - a. M (to K and S): Karen 'n' I're having a fight,
 - b. M (to K and S): after she went out with Keith and not me.
 - c. K (to M and S): Wul Mark, you never asked me out.

Discourse Coherence and Dishonesty

Example from Solan and Tiersma (2005)

- (2) a. P: Do you have any bank accounts in Swiss banks, Mr. Bronston?
 - b. B: No, sir.
 - c. P: Have you ever?
 - d. B: The company had an account there for about six months, in Zurich.
- (2)d interpreted as an indirect answer, implying *no*...

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- . . . *even if* you know it conflicts with Bronston's beliefs.

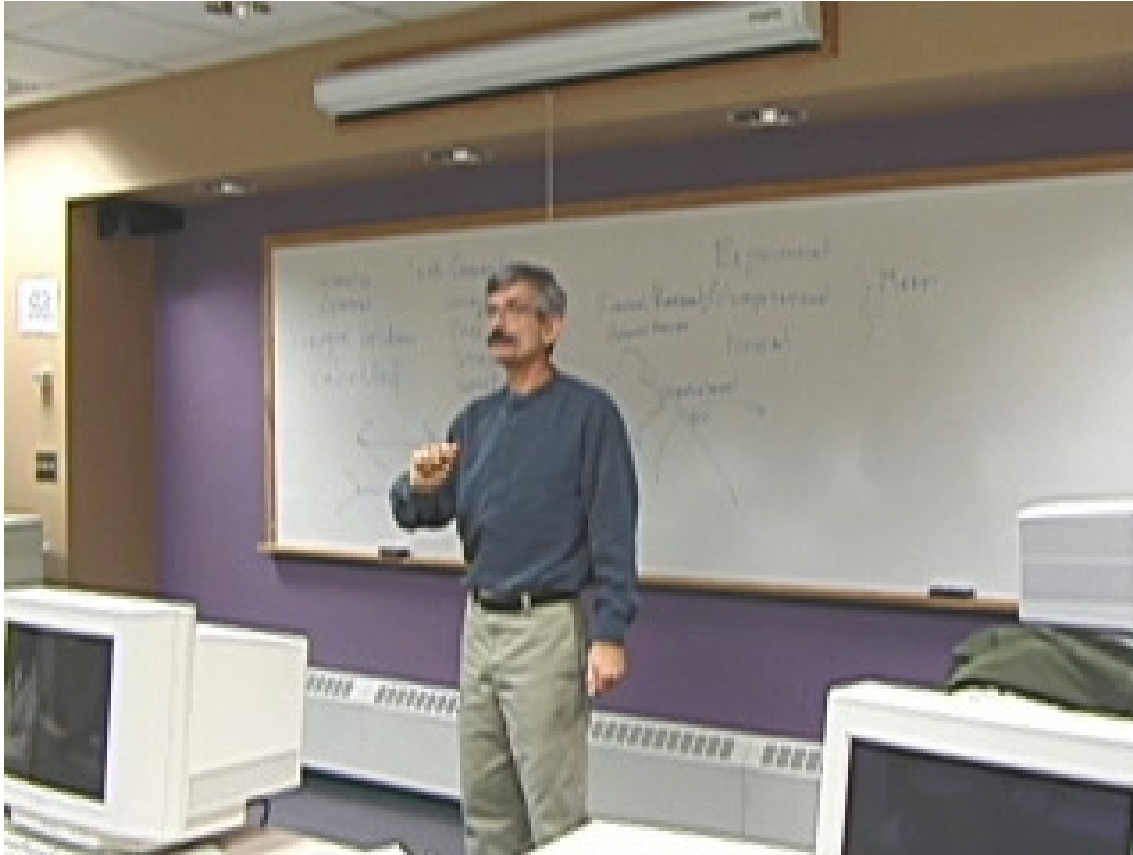
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- (2)d interpreted as an indirect answer, implying *no*...
- ... *even if* you know it conflicts with Bronston's beliefs.
- Literally true, but negative answer false.
- Supreme court overruled conviction for perjury.
- Different ruling probable if Bronston had said "only".

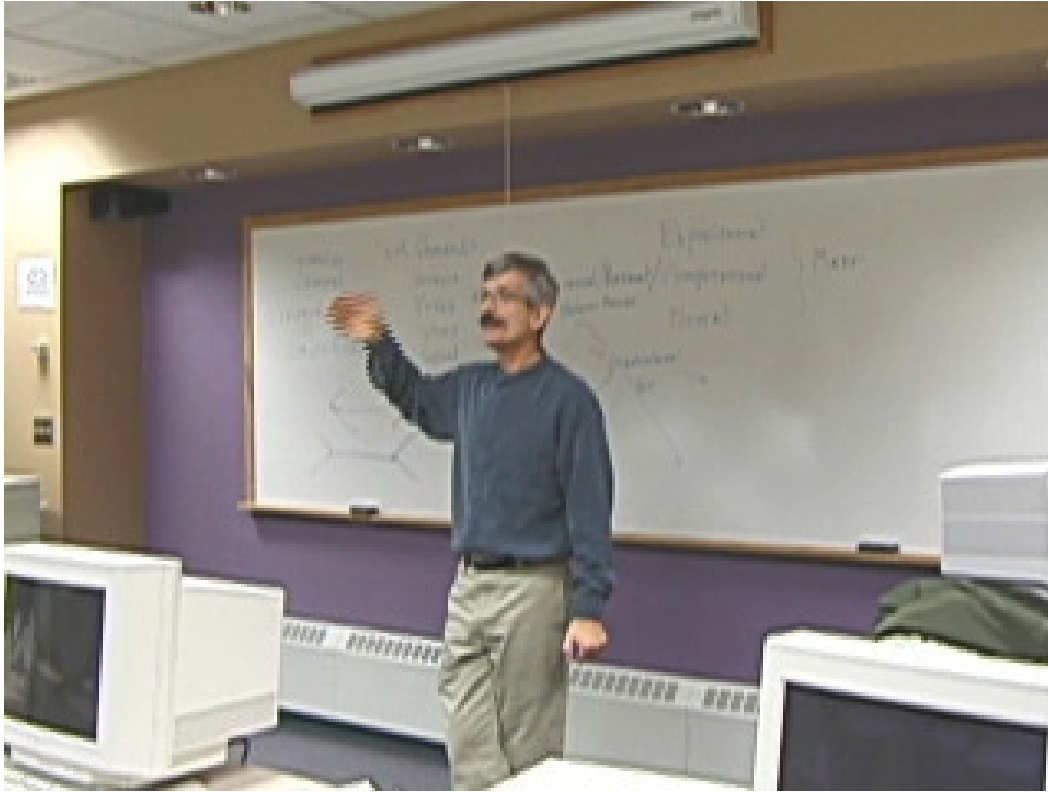
Gesture



Now one thing you could do is totally audiotape hours and hours...

... so that you get a large amount of data that you can think of as laid out on a time line.

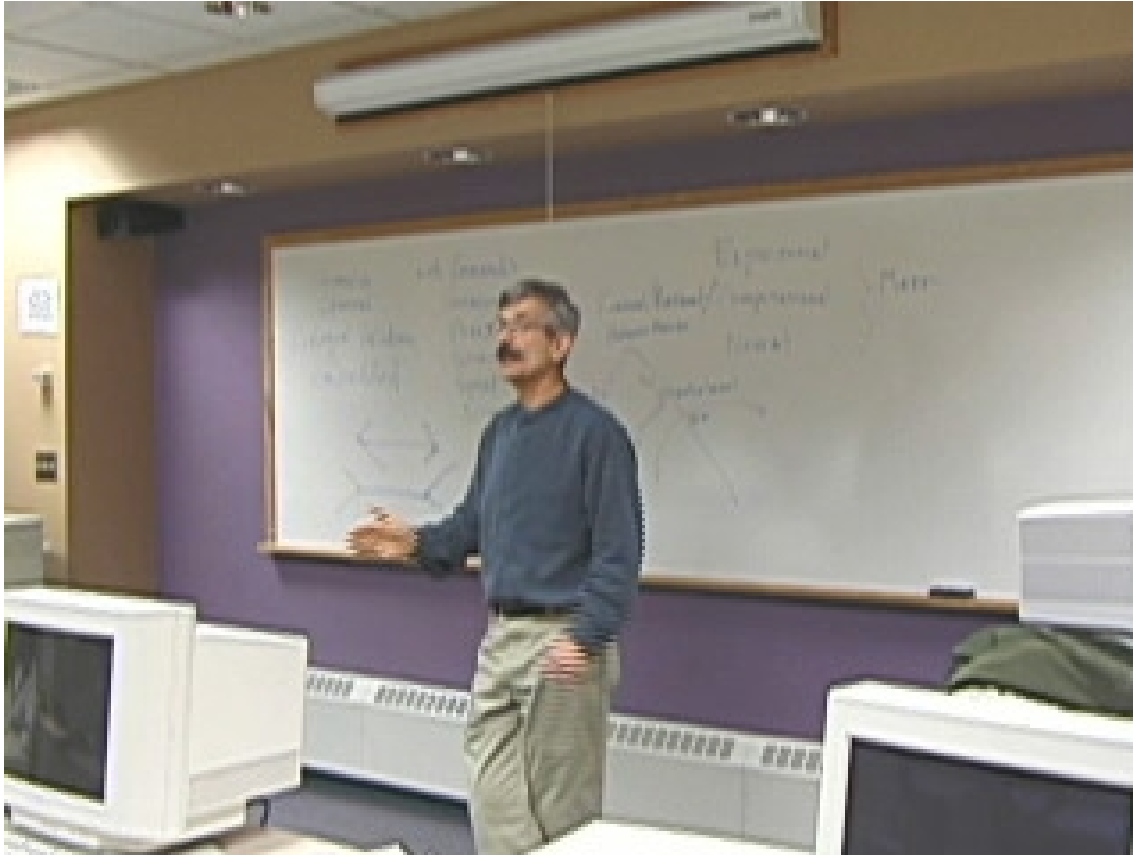
Gesture



And exhaustively go through and make sure that you really pick up all the speech errors

... by individually analysing each acoustic unit along the timeline of your data.

Gesture



Allow two different coders to go through it. . .

. . . and moreover get them to work independently and reconcile their activities.

Meaning of Multimodal Communicative Actions

Coherence relations connect speech and gesture and sequences of gestures.

- speech **so that** gesture
speech **by** gesture
speech **and moreover** gesture

Summary

- **Pragmatics:**
the study of how utterances convey meaning that's linguistically implicit
- **Discourse coherence** drives a lot of pragmatic inference
 - Resolution of pronouns
 - Temporal and spatial inference
 - Agreement (and disagreement)
 - Gesture
 - Plausible Deniability

Next time: How do we represent the meaning of discourse?