Discourse

* Natural language discourse could have looked like this:
  * Andy Kehler is traveling to Stanford on Wednesday. Andy Kehler will give a talk at Stanford. Andy Kehler’s talk at Stanford will be a tutorial on reference. Andy Kehler’s tutorial on reference will be at 4:30. Andy Kehler will give another talk on Thursday. Andy Kehler’s other talk on Thursday will be about pronoun interpretation.

Language gives us choices

* Choices when expressing propositions
  * Active: Obama won the election
  * Passive: The election was won by Obama
  * Clefts: It was Obama who won the election.
  * Topicalization: The election, Obama won.
  * Inversion: Winning the election was Obama.
  * VP-Preposing: [Obama predicted he would win the election, and] - Win the election he did!

And more choices

* Choices when referring to things
  * indefinite ‘a’: Congress passed a bill today.
  * indefinite ‘this’: Congress passed this bill today.
  * definite ‘the’: Congress passed the bill today.
  * familiar ‘that’: Congress passed that bill today.
  * demonstratives: Congress passed this/that?
  * pronouns: Congress passed it!
  * proper names: Congress passed House Bill 2356 today.
Outline

- Pinning down a few basics
- Taking inventory
- A few phenomena that I find interesting
- Concluding thoughts

Pinning down some terminology

If the baby does not thrive on raw milk, boil it.

Referring Expressions

Coreference

Antecedent

Anaphor

Anaphora

Anaphora is not text substitution

- Split antecedents:
  - Barack is a Democrat and Mitt is a Republican. They ...
- Unmentionables (Prince)
  - Little Johnny threw up and then stepped in it.
- Different conceptualizations (Webber, 1983)
  - John gave Mary five dollars.
    - One of them was counterfeit.
    - It was more than he gave Sue.

More reasons

- Variety of referent types (Webber 1991):
  - According to a recent debate report, Perry stumped for the rights of illegal immigrants, and Romney said he was for nationalized health care.
    - But that turned out to be a lie. [speech act]
    - But that turned out to be false. [proposition]
    - That struck me as a funny way of describing the situation. [description]
    - That caused Romney to sink in the polls. [event]
    - That caused both candidates to sink in the polls. [combination of events]

More reasons

- Bach-Peters sentences:
  - The man who shows he deserves it will get the prize he desires.

Discourse models

- Referring expressions are tailored to (the speaker’s beliefs about) the hearer’s mental state, including:
  - their beliefs about the world
  - their discourse model: their mental model of the discourse, which represent the entities and eventualities that have been introduced and the relationships that hold among them
The basics

* Languages provide speakers with a wide variety of linguistic devices with which to refer to things
* Speakers do not select among them randomly
* The linguistic system instead imposes constraints on their use. Felicity might depend on:
  * whether the speaker believes that the hearer has prior knowledge of the referent
  * whether it has been mentioned previously in the discourse
  * whether it is situated in the immediate surroundings
  * how salient or activated it is perceived to be in the hearer’s mind

Big question #1: What?

* We need theories that explain referential systems
* Such theories require two things:
  * An account of how the interlocutors’ discourse models are constructed and evolve with the dynamically-changing discourse
  * An account of the mapping between the signals that different referring expressions encode and the hearer’s set of beliefs (including the discourse model)

Big question #2: How?

* We'll survey a variety of interesting referential phenomena in this talk
* We want to ask ourselves:
  * What do these phenomena tell us about what information is represented in the mind, and how?
  * What is the processing profile of these phenomena, especially in the face of ambiguity?
  * How does the referential system (and people’s use of it) utilize our capacity for inference?

Big question #3: Why?

* Why does the referential system look so complicated and involved?
* What does that fact that languages evolve to have such systems tell us about the language faculty?
* Does this design reflect speakers’ preferences, hearers’ preferences, or a meeting in the middle?

Outline

* Pinning down a few basics
* Taking inventory
* A few phenomena that I find interesting
* Concluding thoughts

Taking inventory

* Indefinite ‘a’ NPs:
  * Congress passed a bill today.
  * Introduce entities into the discourse context that are (normally) new to the hearer
  * The specific/non-specific distinction:
    * Congress passed a bill today. [specific]
    * Congressman Snodgrass would like to sponsor a bill someday. [non-specific]
    * I’m hoping that congress passes a bill tomorrow. [ambiguous]
Other indefinites

- Indefinite ‘this’:
  - Congress passed this bill today.
- Must be specific:
  - I want to buy a car tomorrow. [ambiguous]
  - I want to buy this car tomorrow. [specific]
- A mechanism for marking indefinites as topics? (Gernsbacher and Shroyer, 1989)
- Cf. indefinite ‘some’

Definites: ‘the’-NPs

- Require ‘uniquely identifiable’ referents
- They are sometimes anaphoric... [discourse-old]
  - A bill passed Congress yesterday. The bill...
- ...and sometimes not: [discourse-new]
  - The President of Stanford University has arrived.
  - The smartest undergrad at Stanford should get a prize.
- About half of the-NPs in naturally-occurring data refer to discourse-new referents (Poesio and Vieira, 1998)

Definites: ‘familiar that’

- Congress passed that bill today. [i.e., the one we talked about last week ]
- Referent must be hearer-old (familiar)
  - # “That smartest kid at Stanford...”
  - ‘private shared knowledge’

Definites: demonstratives

- ‘This’ ‘n ‘that
- Referents must be available (‘activated’) in the context (discourse model, situational context)
- Distance is relevant (spatial, temporal, perspective, discourse)
  - A: That’s yours and this is mine.
  - B: No, that’s yours and this is mine.
- I bought a Toyota yesterday. It’s similar to the one I bought five years ago. That one was nice, but this one is even better.

Definites: pronouns

- The bill came up for a vote in Congress yesterday, and they passed it!
- Requires referents that are ‘salient’, ‘topical’, or ‘in focus’
- More on that tomorrow...

An (in)definite: ‘one’-anaphora

- ‘One’-anaphora:
  - My friend bought a Toyota. Now I want one.
- Combines facets of indefinite and definite reference: dependent on an existing referent, but a new representation is created.
- Behaves as a shortened version of one of them
Event reference

* Language also affords us a variety of ways to refer to eventualities:
  * George claimed he won the electoral vote, and
  * Al, the popular vote.  [gapping]
  * Al did too.  [VP-Ellipsis]
  * Al did so too.  ['do so' anaphora]
  * Al did it/that too.  [pronominal event reference]
  * Al did the same thing.  ['same' anaphora]
  * Al promptly objected.  [null complement anaphora]

Event Reference

* Salient questions:
  * Does syntax need to be recovered as part of meaning recovery?
  * Which ones allow exophora?
  * What is the space of ‘strict’ and ‘sloppy’ readings?
  * What contextual factors influence the choice among them, when more than one is felicitous?

Outline

* Pinning down a few basics
* Taking inventory
* A few phenomena that I find interesting
* Concluding thoughts

Inferrables (Bridging)

* Example:
  * I walked up to a house and knocked on the door
  * Accommodation is necessary
  * I almost bought a car yesterday but...
    * the engine was too noisy
    * the stapler didn’t work
    * the TV was blurry

Inferrables

* Event/situation triggers
  * John was murdered yesterday. The murderer got away. (Clark 1975)
  * We went out to dinner last night. The waiter was rude.
* Concluding thoughts

Inferrables

* Different categorizations of the same event:
  * Tom Mitchell, the ex-manager, said in an interview that [District Attorney Bonnie] Dumanis fired him last Friday. He said the split was amicable, but he wasn’t sure why she made the change.
* Inferring a result state: (Webber and Baldwin, 1992)
  * Mix the flour, butter, and water.
    * Knead the dough until smooth and shiny.
    * Spread the paste over the blueberries.
    * Stir the batter until all lumps are gone.
Weak definites

- Weak definites violate unique identifiability:
  - John got off the plane in San Diego and went straight to the hospital (bank, supermarket, #house, # university, #12-story hospital, ...).
  - Fred was reading the newspaper.
  - Go to 30th and Main. There’s a gas station on the corner.

The Baldwin effect

- How many younger brothers does Alec Baldwin have?

Meanwhile, the younger brother of [Alec] Baldwin, William Baldwin, was quick to defend Alec, telling people that Alec is a great human being “who can” get impulsive, but only really really important things like family.

Stephen Baldwin was born in New York and has an estimated net worth of $4 million dollars. An actor, director, and producer, Stephen Baldwin is known for [...]. He is the younger brother of actor Alec Baldwin.

Former Cold Case actor Daniel, who is the younger brother of Alec Baldwin, filed for divorce from Joanne on Wednesday after four years of marriage.

Conversationally-Relevant Descriptions

[Kronfeld, 1990]

- Let’s assume that New York has the nation’s highest crime rate, immigrant population, and number of linguistics graduate students. Consider:
  - New York needs more policemen.
  - The city with the nation’s highest crime rate needs more policemen.
  - The city with the nation’s highest immigrant population needs more policemen.
  - The city with the largest number of linguistics graduate students needs more policemen.
  - The city with the largest number of linguistics graduate students welcomes the members of the Linguistics Society of America.

Deferred Reference (Metonymy)

- Deferred Reference (Nunberg, Ward): Reference to an entity related to (but not denoted by) the conventional meaning of the expression
  - Predicate transfer:
    - I’m parked out back.
  - Common noun transfer:
    - The filet mignon is at Table 7.
  - Reference to both deferred and non-deferred entities are possible:
    - Hey, Shirley, I’ve got a filet mignon at Table 7 that says it’s the best steak he’s ever eaten.

Cataphora

- The antecedent comes after the anaphor
  - According to his memoirs, Dick Cheney has never made a bad decision.
  - Jimmy Carter rarely drank alcohol during his term. In contrast, in the final days of his presidency, Richard Nixon purportedly drank very heavily.
  - An embarrassment to theories of pronoun licensing
Cataphora

- Can readily get cataphora when the anaphor is in a syntactically subordinate clause, as in previous examples
- But syntactic subordination not always required
  - *He’s* not much, but *George Bush is all we’ve got.*
  - *I haven’t seen him,* but Fred is around here somewhere.
  - *She* has the whole city at her disposal and Rosa just sits at home. (Reinhart 1983, attributed to Liberman)
- But this is certainly not the norm:
  - *# He* walked into the room, and then Andy started his lecture.

Lazy pronouns

- The student who revised his paper did better than the one who handed it in as is. (Kartunnen 1969)
- John is bored in his office, but Tom is happy *there.* (Haik, 1986)
- Mary was a student when she was 20, whereas Emily was a comedian *then.*
- Lazy (‘sloppy’) readings not always (or even usually) available:
  - *Mary was worried about her mother and so John called her.*

More on pronouns

- Reference to kinds:
  - My neighbor got a West Highland Terrier yesterday.
    - *It’s really cute.* [individual]
    - *It’s a good dog to get.* [kind]
    - *They’re very high-strung dogs.* [set denoted by kind]
- ‘Pleonastic it’
  - *It* took John a while to read the book.

So-called ‘anaphoric islands’

- Postal (1969):
  - Fritz is a cowboy. *# He* says *they* can be difficult to look after.
  - Dom’s clothes are absolutely elephantine. *# Indeed,* you could almost lose *one* in them.
- Ward et al. (1991):
  - Do parental reactions affect *their* children?
  - I think if I were a Peruvian I wouldn’t want to live *there* for the next couple of years.

Back to ‘that’

- Variety of referent types (Webber 1991):
  - According to a recent debate report, Perry stumped for the rights of illegal immigrants, and Romney said he was for nationalized health care.
    - *But that* turned out to be a lie. [speech act]
    - *But that* turned out to be false. [proposition]
    - *That* struck me as a funny way of describing the situation. [description]
    - *That* caused Romney to sink in the polls. [event]
    - *That* caused both candidates to sink in the polls. [combination of events]
  - When do these representations become available as referents in the discourse model?

Reference to situations

- Reference to situations (Webber 1991):
  - It’s always been presumed that when the glaciers receded, the area got very hot. The Folsum men couldn’t adapt, and they died out. *That’s* what’s supposed to have happened. *It’s* the textbook dogma.
- Processing biases?:
  - Segal, however, had been having his own problems with women: he had been trying to keep his marriage of seven years from falling apart.
  - *When that* became impossible...
  - *When that* became inevitable...
Reference to situations

* Are referents always fully identified?

After a bad beginning, for which it was rightly chided, the Government has got a grip on its Libyan policy.

The Prime Minister may have fumbled at first, but he has successfully pressed for international intervention and skillfully involved several Arab countries. He has neutralised or soothed potential opponents and made a strong case for his strategy to Parliament and the country.

Whether it is by accident or design, the arrangements put Europe, especially France, in the forefront, the US in the background and the UN's endorsement on top.

This is good Middle Eastern diplomacy in the post-Bush world. Nobody – especially the US – wants a repeat of the Iraq fiasco. France, by contrast, does not want a reputation for always standing back when there is hard work to be done.

But that was the easy part.

Concluding thoughts

* Referential systems are extremely rich and interesting
* They allow speakers to take advantage of the hearer’s beliefs, attentional state, and capacity for inference to achieve communicative economy in ways that are often not well understood
* The very existence of this variety gives us insight into the language faculty

Concluding Thoughts

- The-NPs can:
  - refer to discourse-old referents
  - refer to discourse-new referents
  - refer to inferred referents
  - be ‘weak’ definites
  - be metonymic
  - be generic
  - yield conversationally-relevant implicatures

Concluding Thoughts

- How do we make progress on these problems, in:
  - computational linguistics?
  - psycholinguistics?
  - theoretical linguistics?