

The English Referential System (a tutorial)

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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.

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Discourse

- * But instead it looks like this:
 - * Andy Kehler is traveling to Stanford on Wednesday. He will give a tutorial on reference, which will be at 4:30. That talk will be followed by another on Thursday about pronoun interpretation.

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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!

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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.

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Outline

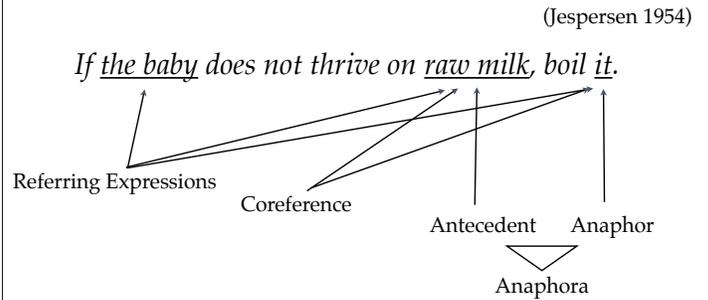
- * Pinning down a few basics
- * Taking inventory
- * A few phenomena that I find interesting
- * Concluding thoughts

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Outline

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- * A few phenomena that I find interesting
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Pinning down some terminology



Anaphora is not text substitution

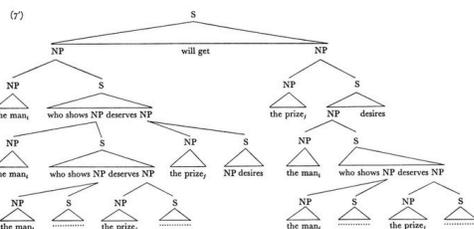
- * Split antecedents:
 - * Barack is a Democrat and Mitt is a Republican. *They ...*
- * Unmentionables (Prince)
 - * Little Johnny threw up and then stepped in *it*.
- * Different conceptualizations (Webber, 1983)
 - * John gave Mary five dollars.
 - * One of *them* was counterfeit.
 - * *It* was more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

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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)

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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?

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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?

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Outline

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

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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]

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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'

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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)

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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'

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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.

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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...

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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*

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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]

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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?

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Outline

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

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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

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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.
- * Definite v. indefinite inferrables
 - * I picked up a book at the library and *the title page* fell out. (# But it turned out to be from another book.)
 - * I picked up a book at the library and *a page* fell out. (But it turned out to be from another book.)
 - * I picked up a book at the library and *a/#the cockroach* fell out.

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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.

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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*.

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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.

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Con 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.

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Con conversationally-Relevant Descriptions

- ✦ [From a CNN Crossfire episode about lifting the AIDS ban on immigrants in the early 90's]
 - ✦ Mr. M, at the same time that we are trying to contain *this fatal disease*, why would you introduce into the U.S. *new sources of infection*?
 - ✦ Mr. M, at the same time that we are trying to contain *AIDS*, why would you introduce into the U.S. people with *AIDS*?

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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.

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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

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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.

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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*.

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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.

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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.

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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?

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Reference to situations

- ✦ Reference to situations (Webber 1991):
 - ✦ It's always been presumed that when the glaciers receded, the area got very hot. The Folsom 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...

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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.

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Outline

- ✦ Pinning down a few basics
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- ✦ **Concluding thoughts**

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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

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Concluding thoughts

- ✦ We need to consider the full range of ambiguity of these forms
- ✦ For example, *it* can:
 - ✦ refer to entities
 - ✦ refer to events and propositions
 - ✦ be cataphoric
 - ✦ be pleonastic
 - ✦ receive a lazy interpretation
 - ✦ receive a generic interpretation
 - ✦ be a bound variable

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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

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Concluding Thoughts

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

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