Discourse Analysis

- Discourse analysis is often used to refer to the analysis of conversations or verbal discourse.
- In general, however, discourse analysis refers to the problem of identifying references to and the relationships between objects and events.
- In written text, discourse analysis primarily involves event segmentation, event and object tracking, focus, and coreference resolution.

Discourse Structure

Person1: So you have the engine assembly finished.  
   Now attach the rope to the top of the engine.  
   By the way, did you buy gasoline today?

Person2: Yes, I got some when I bought the new lawn mower wheel.  
   I forgot to take my gas can with me, so I bought a new one.

Person1: Did it cost much?

Person2: No, and I could use another anyway to keep with the tractor.

Person1: Ok. Have you got it attached yet?

Discourse Segmentation

Person1: I think we should use a global variable here.

Person2: I'm not so sure.  
   I tried that in the telephone operator assignment.  
   It resulted in a terrible bug.

Person1: Oh, by the way, you got a phone call from Fran.

Person2: Did she say what she wanted?

Person1: No, she said it was nothing important.

Person2: Ok, I’ll call her later.  
   At any rate, it took me three days to find it.

Cue Phrases for Discourse Structure

Itemization: first, second, third, next

Elaboration/Expansion: in particular, in addition, for example, in general

Parallel Constructions: on the other hand, in contrast, similarly

Topic Shift: meanwhile, elsewhere, in other news

Digression: by the way, incidentally, I forgot to ask

Endings: bye, OK
Cue Phrases for Semantics

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<th>Cue Phrase</th>
<th>Semantic Relation</th>
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<td>therefore</td>
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Ellipsis

An ellipsis is a clause that is not syntactically complete because an item is implicit from the context.

S1: Helen saw the movie and Mary did too.
S1: Some think that Jack will win the race next week.
S2: But he never will.
S1: Did Sam find the bananas?
S2: Yes.
S3: The peach?
S1: Did Sam put the bananas on the table?
S2: No.
S3: The ice cream in the refrigerator?

VP Ellipsis

S1: Jack forgot his wallet.
S2: Sam did too.

S1: Jack forgot his wallet.
S2: He looked for someone from which to borrow money.
S3: Sam did too.

S1: Jack forgot his wallet so he looked for someone from which to borrow money.
S2: Sam did too.

S1: Jack forgot his wallet when he went out to the movies.
S2: Sam did too.

Discourse Focus

John drank the wine on the table. It was expensive.
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John drank the wine on the table. It was expensive.

Jack saw Sam at the party. He went to the bar to get another drink.

Discourse Focus

John drank the wine on the table. It was expensive.

Jack saw Sam at the party. He went to the bar to get another drink.

Jack saw Sam at the party. He clearly had drunk too much.

Discourse Focus (aka Centering)

- The theory: discourse is organized around an object, called the center, which is the focus of the discourse for several sentences until the focus shifts.

- The discourse center is often pronominalized.

- Once the discourse center is established, you have a strong preference for pronoun resolution.

   Jack left for the party.
   When he arrived, Sam told him about IBM's financial problems. He decided to leave early.

See Sidner (1983) and Grosz(1983) for focus and centering models.

Metonymy

Metonymy occurs when an expression does not refer to its literal object but refers to a related object.

- The trumpet didn't know his part.
- The ham sandwich is restless.
- The U.S. negotiated a treaty with Japan.
- The university was happy to hear that there would be no budget cuts this year.
- John loved his new wheels.
- I paid for the gifts with plastic.
Grice’s Maxims

Grice (1975) proposed that we should incorporate expectations based on rational and cooperative behavior to understand language. He proposed four conversational maxims:

**Quality**: do not say things for which you lack evidence.
⇒ Be truthful.

**Quantity**: your statement should provide the information requested, but only to the extent required. You should not withhold key information, but you should not provide unimportant information either.
⇒ Be complete.

**Relation**: your statement should be relevant to the current topic.
⇒ Be relevant.

**Manner**: avoid obscurity and ambiguity.
⇒ Be helpful.

Speech Acts

A speech act is an action that is performed merely by saying something. In contrast, most sentences are declarative and can be thought of as either true or false.

The following sentences represent speech acts:

Will you marry me?
I bet you ten dollars that the Yankees will win.
Congratulations on your new job!
I christen this boat “The Voyager”.

The following verbs are especially common expressions of speech acts: ask, request, inform, deny, congratulate, confirm, promise

Communicative Acts

The purpose of language is to communicate, so we can attribute different communicative acts to an utterance.

**locutionary act**: the act of saying something.

**illocutionary act**: the action performed by saying something. This represents the intent of the utterance.

Ex: asking, commanding, betting, christening, apologizing, congratulating, etc.

**perlocutionary act**: the action that occurs as a result of the utterance. This represents the action that you hope to accomplish by saying the utterance.

The illocutionary act of apologizing has the goal of being forgiven.
The illocutionary act of threatening has the goal of coercion.

Searle (1979) claims that all illocutionary acts fall into one of five categories.

**Representative Class**: the speaker commits to the truth of what is expressed.
Ex: inform, deny, affirm, confirm

**Directive Class**: the speaker tries to influence the behavior of another.
Ex: request, command, invite, ask, beg

**Commissive Class**: the speaker commits to some future action.
Ex: promise, commit

**Expressive Class**: the speaker expresses a mental state or reaction.
Ex: apologize, congratulate, thank, welcome

**Declarative Class**: the speaker performs a conventional or ritual action.
Ex: christen, fire, resign, appoint
Recognizing Speech Acts

The superficial form of some utterances does not correspond to the intended speech acts. These are called **indirect speech acts**.

Example: *Do you know the time?*

This one locutionary act could correspond to 3 different illocutionary acts:

- a request for the time
- a yes/no question
- an offer to tell someone else the time
  (e.g., a warning to someone that they are late for a meeting)

Note that adding the word "please" tells the hearer that it's a request for the time!

Implementing Speech Acts

Speech acts can be simulated using problem-solving representations.

For example:

(prereq  (inform person1 person2 fact1)
  (know person1 fact1))

(effect  (inform person1 person2 fact1)
  (know person2 fact1))

(prereq  (request person1 person2 action1)
  (can (do person2 action1)))

(effect  (request person1 person2 action1)
  (do person2 action1))