Dis ... what?
Dis ... what?

- I’ll frame this in the context of a Saturday night date dinner later ...

- Discourse has about as much to do with ‘course’ as the main course with recourse

- Comes from Latin ‘discursus’, meaning ‘running to and from’, being involved in an argument

- Actually, discourse is more ‘coarse’ than ‘of course’, as we shall see soon
Text Coherence

- Anaphoric expressions as cohesive devices
- Text can be either coherent or incoherent
- Computational mechanisms exist for determining coherence
- Phrases that make sense on their own might actually not make sense when used together
- Cohesive devices tie together a series of utterances (discourse)
Connecting Utterances via Coherence Relations
Connecting Utterances via Coherence Relations
Connecting Utterances via Coherence Relations

Result

Sven proposed to date. His acquaintance freaked out.
Connecting Utterances via Coherence Relations

Result: Sven proposed to date. His acquaintance freaked out.
Connecting Utterances via Coherence Relations

- **Result**
  - Sven proposed to date. His acquaintance freaked out.

- **Explanation**
  - Sven did not make any sense. His blood sugar was low.
Connecting Utterances via Coherence Relations

- **Result**
  Sven proposed to date. His acquaintance freaked out.

- **Explanation**
  Sven did not make any sense. His blood sugar was low.
Connecting Utterances via Coherence Relations

- Result: Sven proposed to date. His acquaintance freaked out.
- Explanation: Sven did not make any sense. His blood sugar was low.
- Parallel: Sven ordered a beer. She got a Perrier.
Connecting Utterances via Coherence Relations

- **Result**
  - Sven proposed to date. His acquaintance freaked out.

- **Explanation**
  - Sven did not make any sense. His blood sugar was low.

- **Parallel**
  - Sven ordered a beer. She got a Perrier.
Connecting Utterances via Coherence Relations

- **Result** → Sven proposed to date. His acquaintance freaked out.
- **Explanation** → Sven did not make any sense. His blood sugar was low.
- **Parallel** → Sven ordered a beer. She got a Perrier.
- **Elaboration** → Sven ordered a beer. He requested a pint of Warsteiner for $5 at Frog and Firkin.
### Connecting Utterances via Coherence Relations

- **Result**
  - Sven proposed to date. His acquaintance freaked out.

- **Explanation**
  - Sven did not make any sense. His blood sugar was low.

- **Parallel**
  - Sven ordered a beer. She got a Perrier.

- **Elaboration**
  - Sven ordered a beer. He requested a pint of Warsteiner for $5 at Frog and Firkin.
Connecting Utterances via Coherence Relations

- **Result**: Sven proposed to date. His acquaintance freaked out.
- **Explanation**: Sven did not make any sense. His blood sugar was low.
- **Parallel**: Sven ordered a beer. She got a Perrier.
- **Elaboration**: Sven ordered a beer. He requested a pint of Warsteiner for $5 at Frog and Firkin.
- **Occasion**: Sven bought his date a Perrier. They strolled around campus.
Inference Resolution

- Constraints for each of the previous relations need to be coded somehow into a system

- Deduction: if premise true, then conclusion true

- Abduction: if effect is present, then certain cause is responsible ... need to identify most likely cause (P, smallest number of assumptions / heuristics, mixed models), barring alternative explanations

- Can code relations and world and domain knowledge into a system

- Probabilities for some axioms may apply, making them more applicable

- Knowledge predicates and probabilities lead to inference, the sum of a conversation being more than its parts
The all-knowing machine

Can you see the problem/issue with such an approach?

Encoding all knowledge required to make coherence determinations is infeasible.

Basic communication theory, such as rhetorical structure theory, may help build knowledge bases.
Coreference Resolution

- Figuring out what personal pronoun belongs to which noun
- Axioms help resolve coreferences on the go
Discourse Connectives

- Conjunctions such as ‘and’, ‘because’, ‘due to’

- Appear with certain connectives, such as explanation or occasion

- Do not establish meaningfulness in themselves

- Lack of a system’s knowledge still a problem
Structure Coding

- Discourse does not follow a sentence by sentence pattern
- Sentences can refer to statements made at any point in the larger text
- Segments can be combined if a relation exists between them
- Subordinate relations pass one argument, while parallel or occasion relations pass two or more arguments
Psycholinguistic Studies

- Reading Time Experiments
  - depend on language used
  - linked to notions of recency

- Personal pronouns more often linked to previous sentence’s subject than to the object

- Subject named even if referring to the pronoun in next sentence and was already in prior sentence’s object

- Recommended reading: Plous - The Theory of Judgment and Decision Making