Pragmatics Level:
Dialogue Theory

Synchronic Model of Language

Pragmatic

Discourse

Semantic

Syntactic

Lexical

Morphological

Phonetic
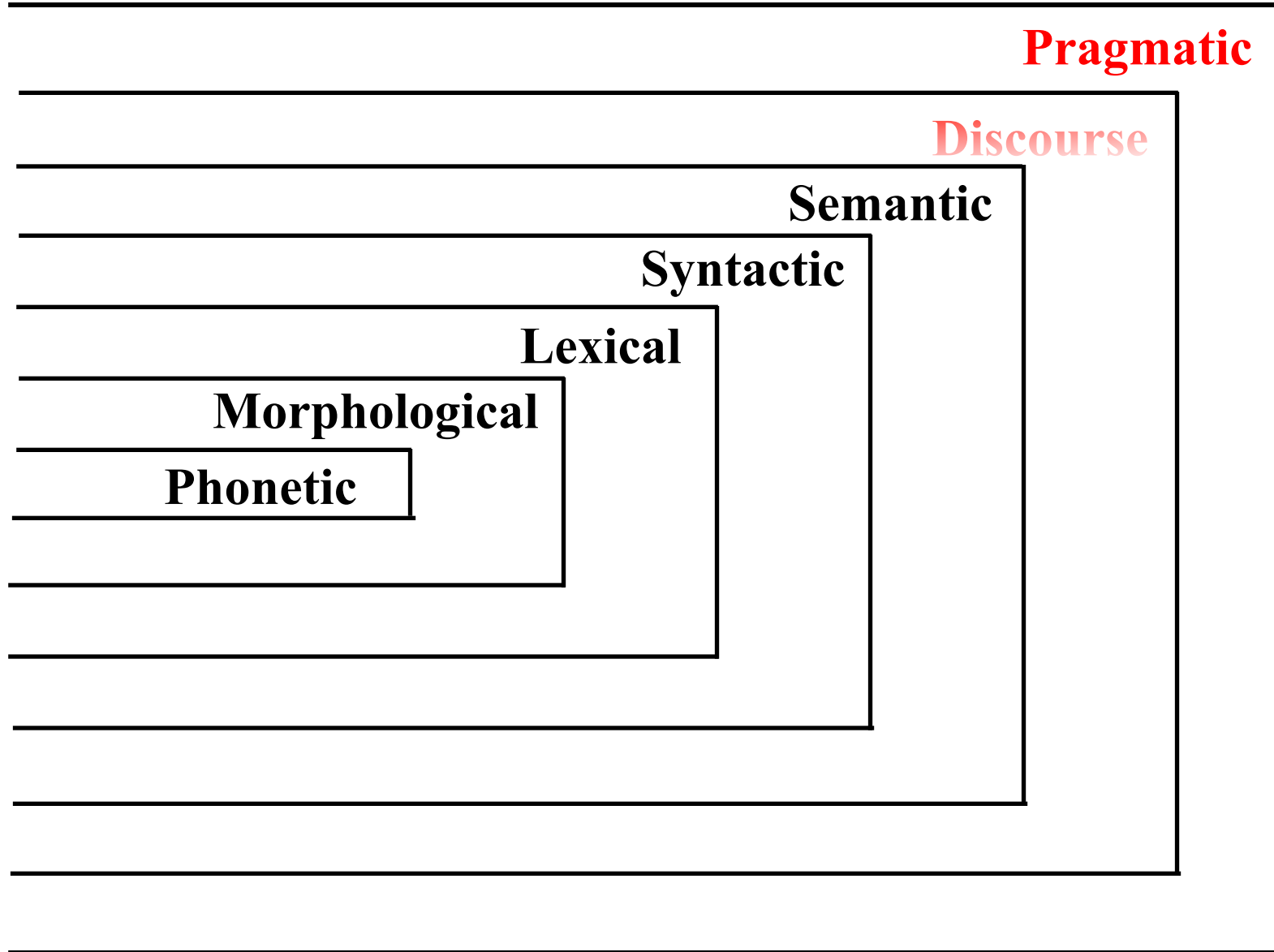
PRAGMATICS

- Functional perspective - The study of language in use
- Generally, aspects of language which require context to be understood
    - How the situational context is grammaticalized
    - World knowledge (knowledge bases) used for understanding
        - Useful pragmatics for semantic understanding of any text
- **One specific goal is to explain how extra meaning is read into utterance without actually being encoded in them**
- Relative emphasis:
    - More research interest in oral text than written text
    - Then, focus on dialogue rather than monologue
    - Of prime interest to natural language generation and human-computer interaction researchers

Topics in Dialogues

- Theory: Properties of Human Conversations
  - Speech Act Theory
  - Gricean Maxims
  - Conversational Structure
  - Dialogue Act Theory
- Analysis: Computational Tasks
  - Using either transcripts of oral conversations or on-line written conversations, even chat
  - Recognition of Dialogue Acts
  - Plan Recognition

Speech Act Theory

- Communication succeeds only if the intention of the speaker is recognized by the listener
    - Proposed by John Austin in 1962 in *How To Do Things With Words*
    - Systematized by John Searle in 1969 in *Speech Acts: An Essay in the Philosophy of Language*

- Propositional content (the literal meaning of the text) does not always fully communicate the speaker's intent

    - Example: *I'm going to pay you back for that.*

Speech Act Theory

- Three Levels of Speech Acts affecting the social reality of the speaker and listener:
    - Locutionary – proposition of speech act
        - The meaning of the sentence
    - **Illocutionary – intention of speech act**
        - The act of asking, answering, promising, etc. in uttering a sentence
    - Perlocutionary – consequences of speech act
        - The (often intentional) production of certain effects upon the feelings, thoughts, or actions of the addressee in uttering a sentence

        "almost any speech act is really the performance of several acts at once, distinguished by different aspects of the speaker's intention: there is the act of saying something, what one does in saying it, such as requesting or promising, and how one is trying to affect one's audience."   Bach

Speech Act Theory

- **Examples of illocutionary acts:**

  "I'm telling you not to do that. " → a warning

  "I will help you tomorrow." → a promise

  "I suggest you read that contract carefully." → advice

  "I hereby inform you that you must pay your debt within 30 days." → an informing act

Taxonomy of Illocutionary Acts' Intents

1. **Assertives** – commit the speaker to something's being the case – *suggest, swear, boast, conclude*

2. **Directives** – attempts by speaker to get listener to do something – *ask, order, request, invite, advise*

3. **Commissives** – obligate oneself to future course of action – *promise, plan, vow, oppose*

4. **Expressives** – share psychological state of speaker about something – *apologize, deplore, thank*

5. **Declarations** – bring about a different state of the world as a result of the utterance – *resign, baptize, marry*

Cooperative Principle

- Grice, H.P. (1975). "*Logic and Conversation*". Cole & Morgan (Eds). *Syntax & Semantics 3*.

  - Provide a principled explanation of how what is communicated is not necessarily what is said

- A set of over-riding conventions / maxims that are adhered to by both speakers and listeners

  - We all intuitively adhere to them without being aware of them

  - Pointing out the fact that conversation is co-operative

- Cooperative principle:

  - Make sure that what you say furthers the purpose of the conversation

Gricean maxims

- Specify what participants in a conversation do in order to converse efficiently

  1. The Maxim of Quality
     - Make your contribution one that is true
       - Do not say what you believe to be false.
       - Do not say that for which you lack adequate evidence.
  2. The Maxim of Quantity
     - Make your contribution as informative as is required for the current purpose of the conversation.
     - Do not make your contribution more informative than is required.
  3. The Maxim of Relevance - make it relevant
  4. The Maxim of Manner
     - be clear, avoid obscurity, avoid ambiguity, be brief, be orderly

Conversational Implicatures

Speakers generally follow the cooperative principle and listeners generally assume that they are following it

If speaker is observing the maxims directly, he will rely on listener to amplify what he is saying by some straightforward inferences, called implicatures

Example:

A: Makes statement / asks question

B: Responds, but appears to fail to be co-operative

A: Assumes B is being co-operative; makes inferences in order to maintain assumption that B is being co-operative

These **inferences** are what have come to be known as "conversational implicatures"

Conversational Implicatures

Example 1

    A asks B: *Would you like to go to a movie tonight?*

    B responds: *I have to study for an exam.*

Example 2

    A: *Where's Bill?*

    B: *There's a yellow VW outside Ann's house.*

Example 3

    A: *I've just run out of gas.*

    B: *There's a garage around the corner.*

Example 4

    Tim: *Can I play cards with Pete?*

    Mom: *How is your homework coming along, Tim?*

Conversational Structure

- Conversational analysis tries to understand how people organize conversation in order to achieve their communication

- Some types of conversations exhibit particular structure:
    - Opening of telephone conversations have a 4-part structure
        - Stage 1: enter a conversation with a summons-response adjacency pair
        - Stage 2: identify speakers
        - Stage 3: establish joint willingness to converse
        - Stage 4: raise the first topic, usually done by the caller

- Two more general conversational structures: turn-taking and sequencing

Turn-taking

- Dialogue is characterized by taking turns: Speaker A says something, then Speaker B, etc.

- Turn-taking components are the utterances of the participants

- Turn-taking allocation describes how participants organize the interaction by allocating turns to speakers

  - At each transition point,

    - If the current speaker has explicitly selected A as the next speaker, then A must go next

        What do you think, Jessie?

    - If A doesn't speak, it is "significant silence", interpreted as a refusal to respond

    - If the current speaker hasn't explicitly selected a speaker, anyone can speak

    - If no one else takes the next turn, the current speaker may take it

Sequencing

- Focuses on how the components are organized in the conversation
  - Adjacency pairs: many types of interactions come in pairs, e.g. Question/Answer, Offer Assistance/Rejection or Acceptance, etc.
  - Pre-sequences: prelude to open the conversation or to start a new topic
    - Example: *Guess what?*
  - Preference organization: preference for some actions over others, e.g. agreeing with someone more straightforward and shorter than expressing disagreement
  - Repair: how to deal with problems in hearing or understanding
    - Example: *What did you say?*
      Do you mean . . . ?

Dialogue Act Theory

- In computational linguistics, more detailed systems attempt to explain not only the informative aspects of conversations, but the dialogue control aspects of an utterance

- Theory by Bunt (1994) lists the following (top-level) categories
  - Informative
    - Task-oriented: information seeking or providing
  - Dialogue control
    - Feedback: positive or negative
    - Discourse structuring: topic management, dialog delimination
    - Interaction management:
      - Turn management
      - Time management
      - Own communication managements
      - Social obligations management: introduction, greeting, apology, thanking

16

Dialog Acts in Transcribed Speech

- Systems of dialog acts further developed by annotation of large amounts of transcribed speech (Stolcke et al 2000)

- Hand-labelled 1,155 conversations from transcribed telephone conversations, the Switchboard corpus

- Used the DAMSL tag set developed by Core and Allen (1997) of approximately 50 dialog act tags in a hierarchy of groups and sub-groups

  - Statements and Opinions
    Well, we have a cat ...
    Well, rabbits are darling ...

  - Questions
    - Yes-No questions   *Do you have to have any training?*
    - Declarative question   *So you're taking a government course.*
    - Wh questions   *Who was that man?*

Additional dialog act tags

- Backchannels – any short utterance that plays a discourse structuring role, such as indicating that the speaker should continue
  Uh, huh
  Um

- Turn Exits and Abandoned Utterances
  So

- Answers and Agreements

  - Includes sub-tags of accept, reject. maybe, part

- And many other types, such as

  - Hedge   *so I don't know*

- The next two slides show example dialog and table of tags with frequency of occurrence in the Switchboard corpus

  - http://web.stanford.edu/~jurafsky/ws97/CL-dialog.pdf
    pages 2,3

18

Switchboard Dialogue Example

Table 1
Fragment of a labeled conversation (from the Switchboard corpus).

Speaker	Dialogue Act	Utterance
A	YES-NO-QUESTION	So do you go to college right now?
A	ABANDONED	Are yo-,
B	YES-ANSWER	Yeah,
B	STATEMENT	it's my last year [laughter].
A	DECLARATIVE-QUESTION	You're a, so you're a senior now.
B	YES-ANSWER	Yeah,
B	STATEMENT	I'm working on my projects trying to graduate [laughter].
A	APPRECIATION	Oh, good for you.
B	BACKCHANNEL	Yeah.
A	APPRECIATION	That's great,
A	YES-NO-QUESTION	um, is, is N C University is that, uh, State,
B	STATEMENT	N C State.
A	SIGNAL-NON-UNDERSTANDING	What did you say?
B	STATEMENT	N C State.

Table 2

The 42 dialogue act labels. DA frequencies are given as percentages of the total number of utterances in the overall corpus.

Tag	Example	%
STATEMENT	*Me, I'm in the legal department.*	36%
BACKCHANNEL / ACKNOWLEDGE	*Uh-huh.*	19%
OPINION	*I think it's great*	13%
ABANDONED / UNINTERPRETABLE	*So, -/*	6%
AGREEMENT / ACCEPT	*That's exactly it.*	5%
APPRECIATION	*I can imagine.*	2%
YES-NO-QUESTION	*Do you have to have any special training?*	2%
NON-VERBAL	*<Laughter>,<Throat_clearing>*	2%
YES ANSWERS	*Yes.*	1%
CONVENTIONAL-CLOSING	*Well, it's been nice talking to you.*	1%
WH-QUESTION	*What did you wear to work today?*	1%
NO ANSWERS	*No.*	1%
RESPONSE ACKNOWLEDGMENT	*Oh, okay.*	1%
HEDGE	*I don't know if I'm making any sense or not.*	1%
DECLARATIVE YES-NO-QUESTION	*So you can afford to get a house?*	1%
OTHER	*Well give me a break, you know.*	1%
BACKCHANNEL-QUESTION	*Is that right?*	1%
QUOTATION	*You can't be pregnant and have cats*	.5%
SUMMARIZE / REFORMULATE	*Oh, you mean you switched schools for the kids.*	.5%
AFFIRMATIVE NON-YES ANSWERS	*It is.*	.4%
ACTION-DIRECTIVE	*Why don't you go first*	.4%
COLLABORATIVE COMPLETION	*Who aren't contributing.*	.4%
REPEAT-PHRASE	*Oh, fajitas*	.3%
OPEN-QUESTION	*How about you?*	.3%
RHETORICAL-QUESTIONS	*Who would steal a newspaper?*	.2%
HOLD BEFORE ANSWER / AGREEMENT	*I'm drawing a blank.*	.3%
REJECT	*Well, no*	.2%
NEGATIVE NON-NO ANSWERS	*Uh, not a whole lot.*	.1%
SIGNAL-NON-UNDERSTANDING	*Excuse me?*	.1%
OTHER ANSWERS	*I don't know*	.1%
CONVENTIONAL-OPENING	*How are you?*	.1%
OR-CLAUSE	*or is it more of a company?*	.1%
DISPREFERRED ANSWERS	*Well, not so much that.*	.1%
3RD-PARTY-TALK	*My goodness, Diane, get down from there.*	.1%
OFFERS, OPTIONS & COMMITS	*I'll have to check that out*	.1%
SELF-TALK	*What's the word I'm looking for*	.1%
DOWNPLAYER	*That's all right.*	.1%

The five remaining tags were less than .1%

Maybe/Accept
Tag-question
Declarative question
Apology
Thanking