

Language Understanding:

Structure

phonology	sound
syntax	structure
semantics	meaning
pragmatics	use

1. Perception:
 - lexical access and retrieval
 - issues regarding lexical ambiguity, Swinney, 1979
2. Parsing:
 - constituent & sentence construction
 - evidence for....
 - Jarvella, 1971, Caplan, 1972, Graf & Torrey, 1966
3. Semantic processing
 - deriving propositional structure
 - immediacy of interpretation
 - integration of syntactic and semantic processing
4. Utilization:
 - integration of sentence meaning with existing knowledge
 - inferences of reference, pronominal reference
 - given/new
 - text structure
 - coherence
 - bridging inferences
 - pragmatics

Semantics:

Frame-based understanding:

Tarzan: "Jane fruit eat"

eat

isa

action

agent

animal or agent or activity..

capable of consuming things

object

food or something capable of being consumed

constraint

agent capable of consuming object

preferences:

deep explicit methods

statistical methods

Utilization (1)

Integration into LTM structures
inference of unstated
inference of reference
pronoun reference

Clark & Haviland 1970's "given / new" distinction,
supposition vs assertions:

subject predicate
stress
definite/indefinite articles
structures such as fronting
"It was a chair that she bought"

evidence:

Haviland & Clark 1974
"given an alligator.....The alligator
"wanted an alligator.....The alligator

Loftus & Zanni 1975
"the broken headlight"

inference of the unstated: (frame-based understanding)

McKoon & Ratcliff 1981
pounded boards -> hammer
Just & Carpenter 1987
swept -> broom

pronoun reference:

Just & Carpenter 1987
gender
grammatical role
recency
general knowledge

but need for hierarchical representation of discourse

Grosz (1975) assembly and reassembly of pumps

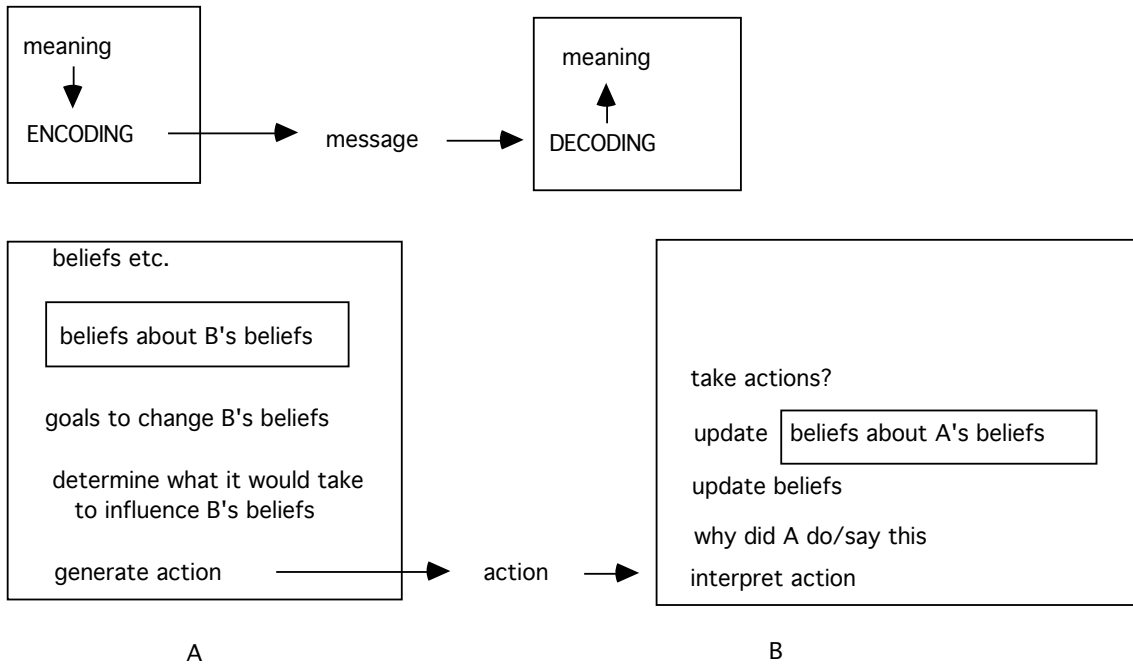
Language Comprehension

tool for communication:

(vs. Shannon & Weaver Model)

- gist
- implication
- context

Shannon & Weaver Model vs. Communication Model



Example: Wilensky's UC system

literal understanding
indirect speech acts
domain understanding

Plan Based Understanding

"Do you have a watch?"
"Do you know where the bus for downtown stops?"
"Is there a gas station around here?"

Answer requires: "Why do you want to know?"

OUTLINE:

Plan schemas

steps in the plan
items involved in, required for plan

pointers from items to plans they are involved in
e.g., watch -> time telling plan

pointers from plans to larger plans of which they are
subplans
telling time ->
various activities that require knowing what
time it is

"Do you have a watch?"
"Don't worry, your next meeting has been
moved back a half an hour."

identify what plans speaker may be executing that require
the information they are seeking

Pragmatics - early insights:

(see also plan-based understanding, communication model)

Searle: Speech Acts

representatives
directives
commissives
expressives
declarations

Indirect Speech Acts

H's ability to perform A
S's wish that H will do A
referring to H's doing A
H's desire or willingness to do A
reasons for doing A

- *not imperatives
- *not ambiguous
- *conventional forms
- *not idioms
- *can be used literally
- *not additional sentence meaning
but additional speaker meaning

applications:

database interfaces
CSCW (computer supported cooperative work)

Grice

conversational implicature

Talking is rational, purposive behavior based on common goals, interactions of participants, continuation of transaction

Cooperative Principle

"Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged."

Conversational Maxims:

1. Quantity:
enough, not too much
2. Quality:
don't say what you believe is false or for which you lack information
3. Relation:
be relevant
4. Manner:
be brief, orderly, avoid obscurity, ambiguity