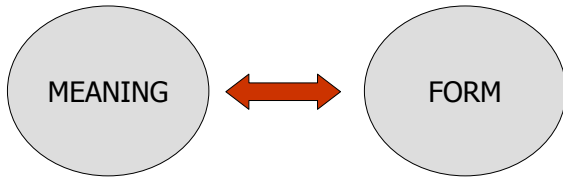


What is the basic problem?



The psycholinguistic scenario

(homepage of the Max Planck Institute for Psycholinguistics, Nijmegen, Netherlands)



What are the data for studying language?

- production or comprehension
- elicited or spontaneous
- isolated units or connected discourse
- modality
 - speaking / listening
 - writing / reading
 - signing / watching
 - gesturing / watching

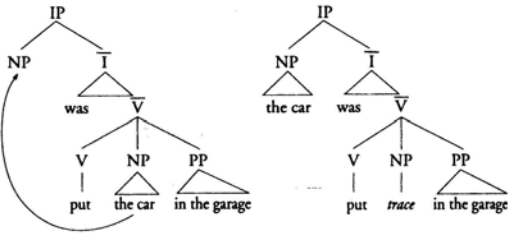
How are the data represented and modeled?

- recordings
- transcriptions
- codes
- diagrams and flow charts
- logical and mathematical notation
- computer programs
- neural models

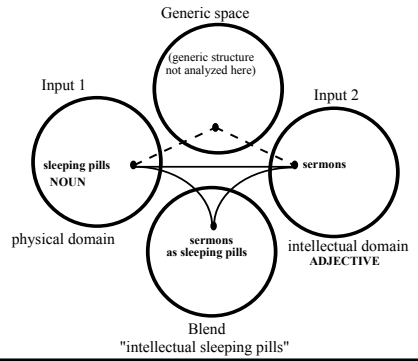
SYNTAX: Language as geometry

DEEP STRUCTURE

SURFACE STRUCTURE



SEMANTICS: Language as mental spaces



SEMANTICS: Language as feature spaces

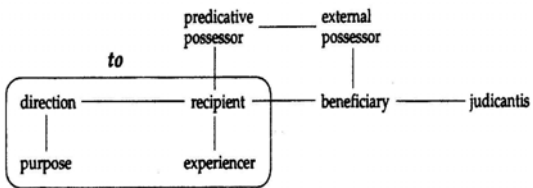


FIG. 8.1. A semantic map of typical dative functions/the boundaries of English *to*.

CONNECTIONISM: Language as computation

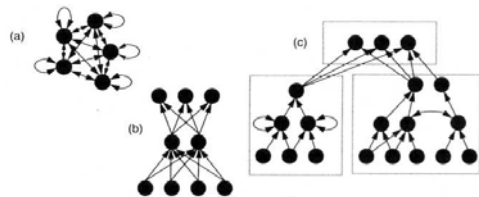


FIGURE 2.1 Various types of connectionist networks. (a) A fully recurrent network; (b) a three-layer feedforward network; (c) a complex network consisting of several modules. Arrows indicate direction of flow of excitation/inhibition.

PRAGMATICS: Language as communicative interaction

- C: ((rings)) ((SUMMONS))
- R: Hello ((ANSWER)) + ((DISPLAY FOR RECOGNITION))
- C: Hi ((GREETINGS 1ST PART)) ((CLAIM THAT C HAS RECOGNIZED R)) ((CLAIM THAT R CAN RECOGNIZE C))
- R: Oh hi:: ((GREETINGS 2ND PART)) ((CLAIM THAT R HAS RECOGNIZED C))

PSYCHOLINGUISTICS: Language as processing

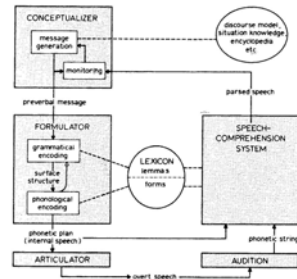
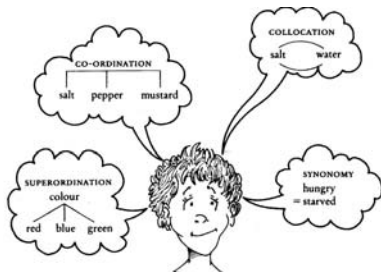


Figure 1.1
A blueprint for the speaker. Boxes represent processing components; circle and ellipse represent knowledge stores.

Willem J. M. Levelt. *Speaking: From intention to articulation.* (MIT Press, 1989)

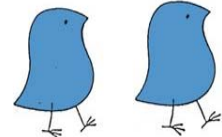
PSYCHOLINGUISTICS: Language as acquired and stored knowledge



Some evidence for stored linguistic knowledge



This is a wug.



Now there is another one.
There are two of them.
There are two ...

a major psycholinguistic issue with regard to knowledge

Where does it come from?

- **innate?** (pre-wired, biologically specified)
- **learned?** (build up by various mechanisms in the course of experiencing and communicating)

a major psycholinguistic issue with regard to processing

- **serial processing?**
 - one step after another
 - independent modules
- **parallel processing?**
 - continuous access to all relevant types of information
 - interactive (“ecological”) system

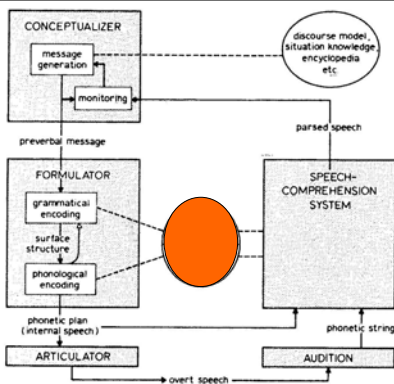
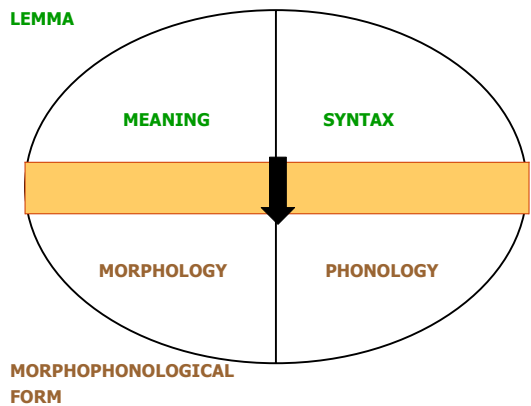
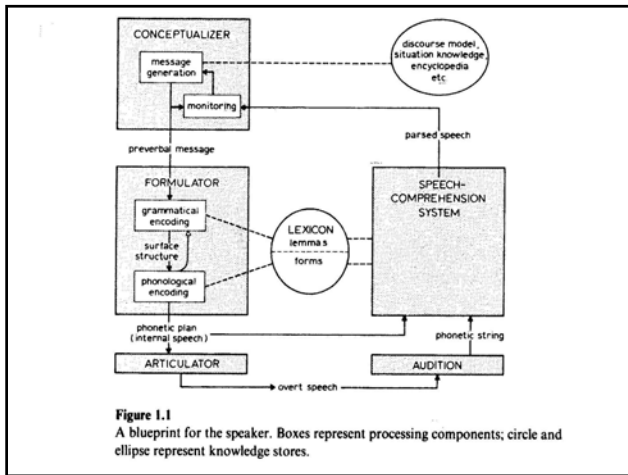


Figure 1.1
A blueprint for the speaker. Boxes represent processing components; circle and ellipse represent knowledge stores.





phoneme monitoring task

- The traveling **b**assoon player found himself without funds in a strange town.
- The itinerant **b**assoon player found himself without funds in a strange town.
- The merchant put his hay **b**eside the machine.
- The merchant put his straw **b**eside the machine


Response times in a word monitoring task indicate online processing of several types of information.

- **NORMAL SENTENCE**
John carried the guitar. 241 msec
- **PRAGMATIC ANOMALY**
John buried the guitar. 268 msec
- **SEMANTIC ANOMALY**
John drank the guitar. 291 msec
- **CATEGORIAL VIOLATION**
John slept the guitar. 320 msec

People recognize words before the end of the word – especially with context

<u>WORD RECOGNITION TASK</u>	<u>RECOGNITION TIME FROM TIME OF WORD ONSET</u>
shadowing	200 msec
phoneme monitoring	200 msec
gating in isolation	333 msec
gating with context	200 msec

People recognize words without full acoustic information

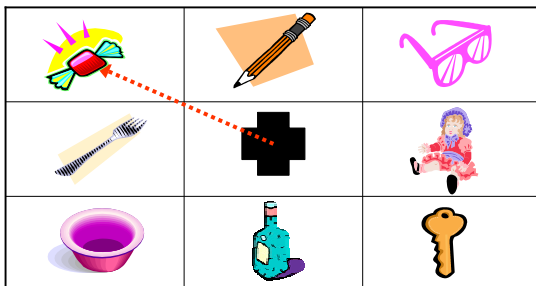
It was found that the eel was on...

- the axle.  wheel
- the shoe  heel
- the orange  peel

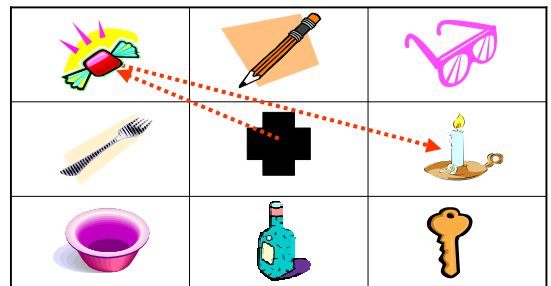
Eye-tracking experiments

- Task:
 - Scan array.
 - Fixate on a point and listen to verbal instructions.
- Finding: People move their eyes to a referent as soon as they have enough linguistic information to identify it

"Pick up the candy."



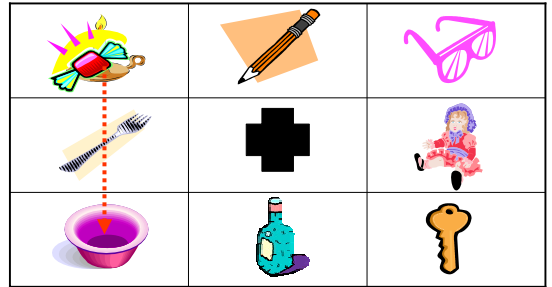
"Pick up the candy."



- “The mean time to initiate an eye movement to the correct object (candy) was 145 ms from the end of the word when there was not another object with a similar name, compared with 230 ms when an object with a similar name (candle) was included in the display.”
- “Because it takes about 200 ms to program a saccadic eye movement, these results demonstrate that the individual identified the object before hearing the end of the word, when none of the other objects had a similar name.”

Michael Tanenhaus, Michael Spivey-Knowlton, Kathleen Eberhardt, and Julie Sedivy (1995)

“Put it inside the bowl.”



Expanding the contexts further: beyond literal meaning (Herb Clark's example)

PARENT TO CHILD: “Haven't you forgotten to clean up your room?”

1. **YES/NO QUESTION:** *Is it or is it not the case that you have forgotten to clean up your room?* ↴
2. **ASSERTION:** *You have forgotten to clean up your room.* ↴
3. **REPRIMAND:** *You haven't cleaned up your room, as you were supposed to.* ↴
4. **ASSERTION:** *I want you to clean up your room.* ↴
5. **REQUEST:** *Clean up your room.*

Herb Clark's summary:

- “The direct interpretation, a question, is used to make an assertion, the assertion to make a reprimand, the reprimand to make a second assertion, and the second assertion, via the sincerity condition on felicitous requests, to make a request.”
- “The child is meant to register all of these interpretations at once, but in relation to each other as the chain specifies. For example, if he says *No, I've already done it*, he has answered the first question in such a way as to nullify the force of the remaining four interpretations.”
- “Or if he says *But I wasn't supposed to*, he denies the reprimand, nullifying the prior assertion and question, and questioning the basis for the following assertion and request.”

Some consequences for experimental psycholinguistics (Clark's "dogmas of understanding")

- "Most accounts of understanding are really accounts of how listeners with inadequate backgrounds conjecture about what speakers mean."
- "When language is brought into the laboratory, it is usually stripped of its social features. Natural and laboratory settings are as different as day and night."
- "All linguistic signals are composites of describing and indicating [locating], and many also include demonstrating [gesturing]."

The psycholinguistic scenario

(homepage of the Max Planck Institute for Psycholinguistics, Nijmegen, Netherlands)



A psycholinguistic lab scenario: eye tracking



A language ecology scenario

(preschool interaction at the California School for the Deaf in Fremont)

[Berkeley PhD dissertation: Amy Weinberg, 2003]