

INTRODUCTION TO APPLIED LINGUISTICS

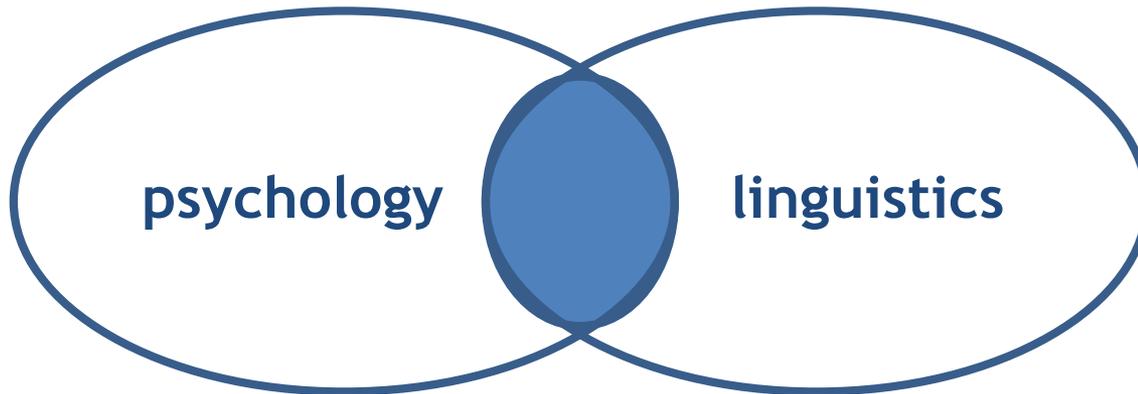
Psycholinguistics



Lilla Pintér

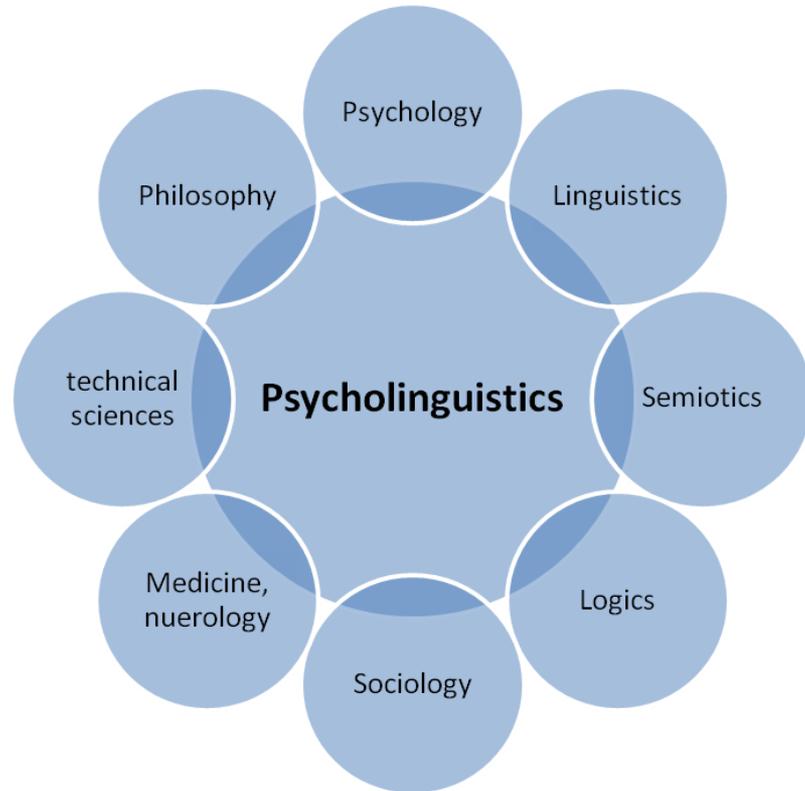
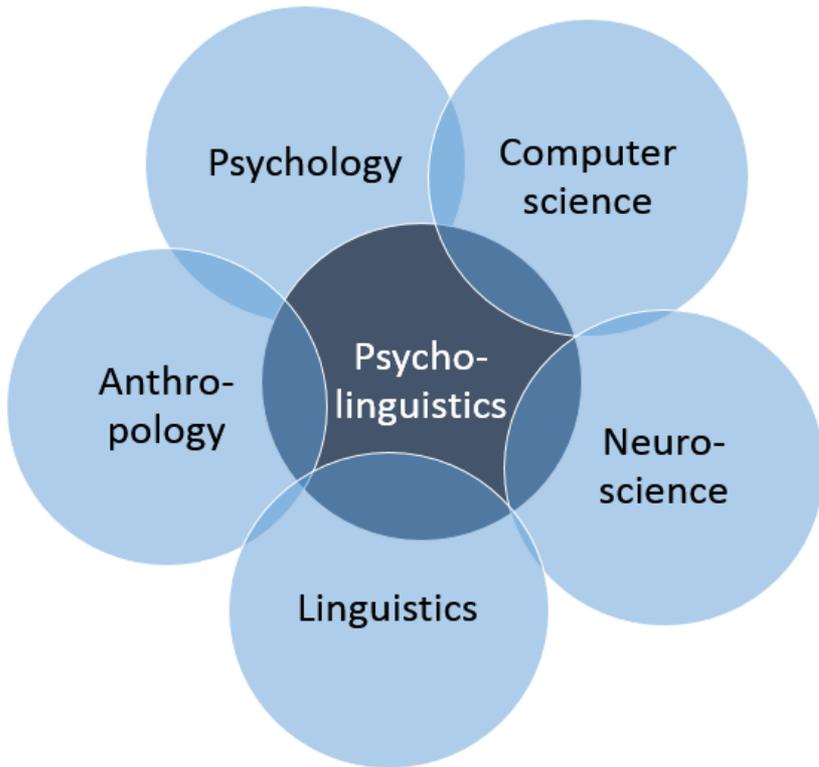
09. 27. 2019.

Psycholinguistics



- language comprehension
- language production
- language acquisition
- language disorders

Related disciplines



Linguistics and psycholinguistics

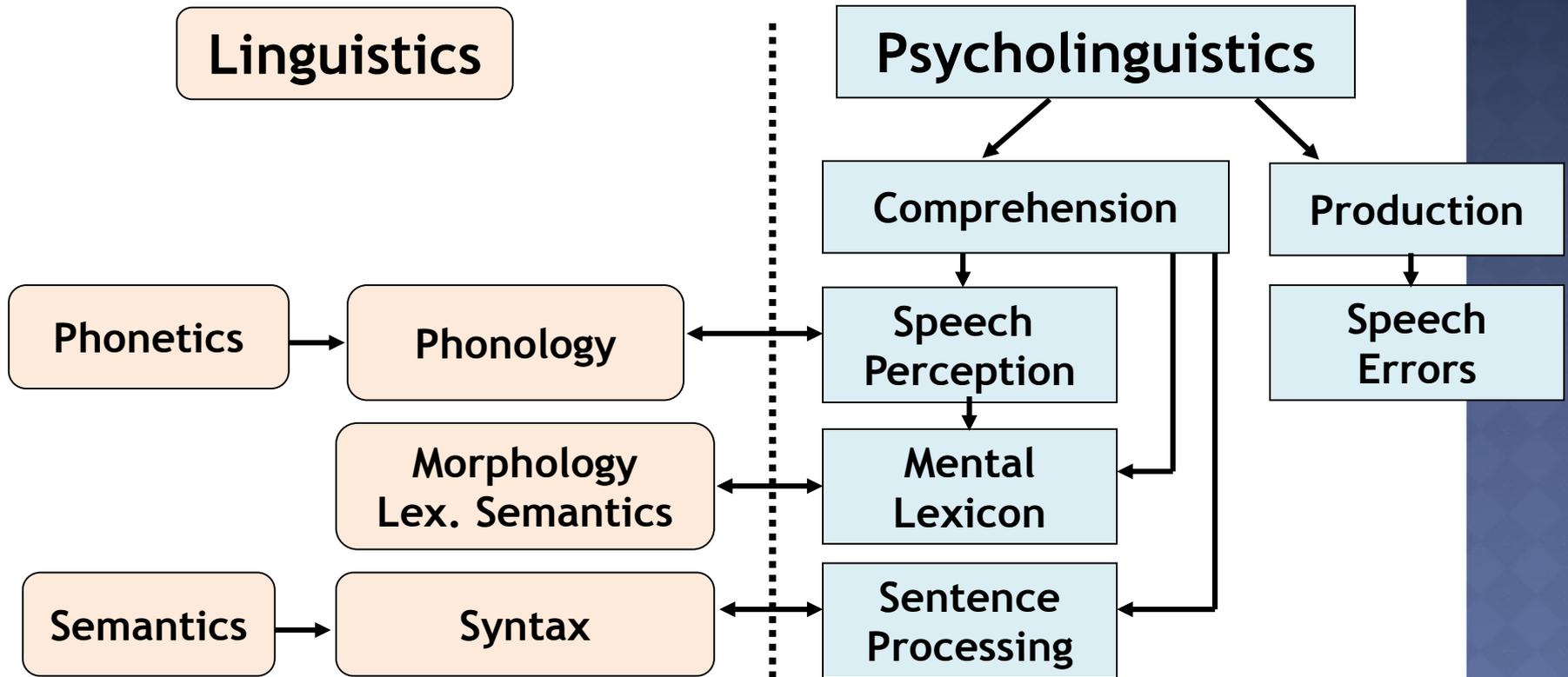


Figure from Irina Sekerina (CUNY)

The history of psycholinguistics

- late 1800s – modern psychology
modern linguistics



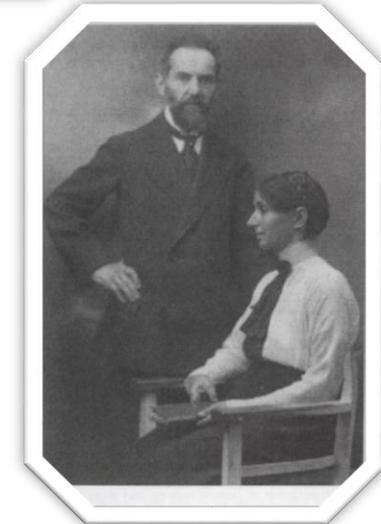
- Wilhelm Wundt (1832–1920)

- ~ experimental work
- ~ lab in Leipzig



- William Stern (1871–1938)
and Clara Stern (1877–1948)

- ~ diary about the language
acquisition of their children
- ~ focus on creativity of language use



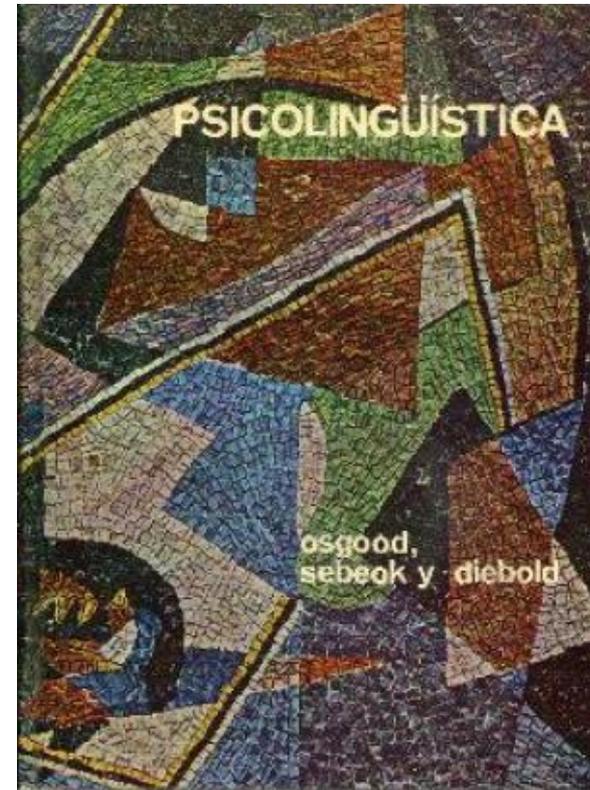
The history of psycholinguistics

- ◎ **1946**: first use of the term *psycholinguistics* by Pronko



- ◎ **1953**: interdisciplinary seminar at Indiana University and its proceedings **Osgood & Sebeok (1954)**

- ◎ conferences
- ◎ periodicals
- ◎ departments
- ...



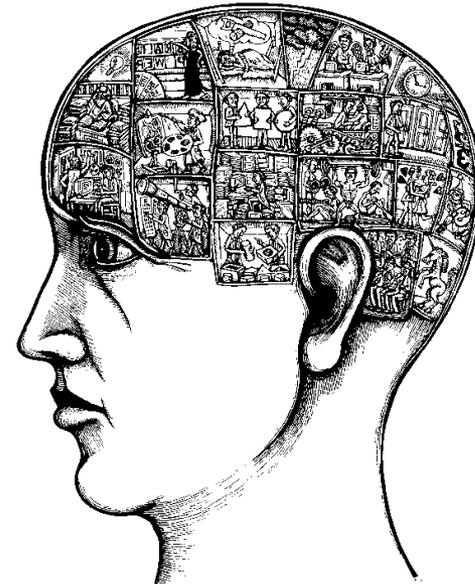
The history of psycholinguistics

- ◎ **behaviorism** (Skinner 1957):
language is merely **verbal behavior**
↔ Chomsky (1959)

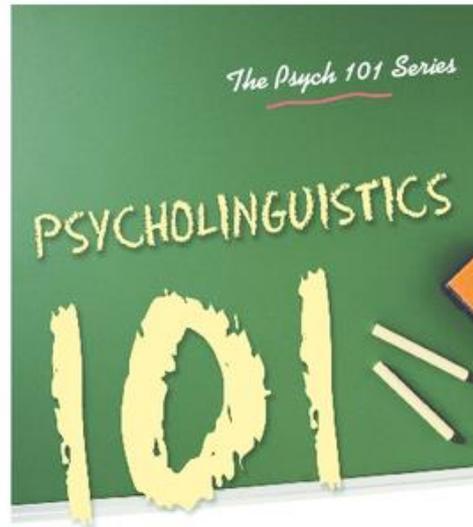


- ◎ Piaget ↔ Chomsky (1978)
Is **intelligence** prior to **language**, or is language
a source of intelligence?

- ◎ Jerry Fodor (1935–2017):
modularity hypothesis (1983)
~ isolated processes of language
processing
~ is language as a system distinct
from other cognitive systems



Research methods in psycholinguistics



H. Wind Cowles

SPRINGER PUBLISHING COMPANY

I. Offline measures

- ⦿ provide information about the **end state or result of processing** (low temporal resolution)
- ⦿ questionnaires, button presses, vocal responses, sentence–picture matching tasks
- ⦿ suitable for measuring **grammatical judgments** and **preferences**
- ⦿ quick, no expensive equipment is necessarily required, easier to recruit participants
- ⦿ **main limitations:**
 - ~ no information about real time processes
 - ~ output can be interpreted in various ways

I. Offline measures

1. Questionnaires

- ⦿ a participant reads or listens to a sentence and answers a comprehension question
- ⦿ the measure of interest is how participants respond to:
 - ~ complex sentences: there is a correct answer, and error rates can be analyzed
 - ~ ambiguous sentences: distribution of responses (preferences) can be analyzed

Someone shot the servant of the actress that was on the balcony.

Who was on the balcony? servant actress

I. Offline measures

1. Questionnaires

- Likert-scales

(a) Why did the Duchess sell a portrait of Max?

① ② ③ ④ ⑤ ⑥ ⑦

(b) Who did the Duchess sell a portrait of?

① ② ③ ④ ⑤ ⑥ ⑦

(c) Who did the Duchess sell the portrait of?

① ② ③ ④ ⑤ ⑥ ⑦

(d) Who did the Duchess sell Max's portrait of?

① ② ③ ④ ⑤ ⑥ ⑦

I. Offline measures

2. Button presses

- ◎ **lexical decision task**: a participant needs to make a decision about whether combinations of letters are words or not
- ◎ **self-paced reading**: time taken to press the button gives an indication of the processing difficulty at each stage

James knew that kids like Hannah because she enjoys playing with other children.

James knew that kids like Hannah enjoyed playing with other children.

I. Offline measures

3. Vocal responses

- ⦿ production + comprehension
- ⦿ both the **nature** and the **length** of responses can be measured

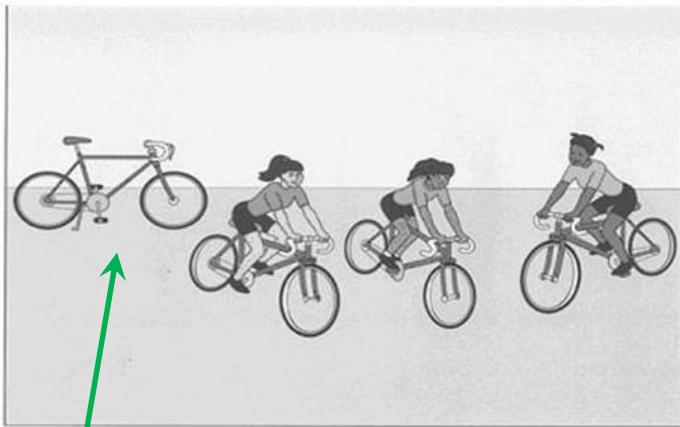
Verbal fluency test: participants have to produce as many words as possible from a category in a given time (1 minute).

- ⦿ **acoustic information** can be analyzed as well (intonation, speech errors)
- ⦿ other capacities such as **working memory** can be tested (repeat words, phrases, sentences)

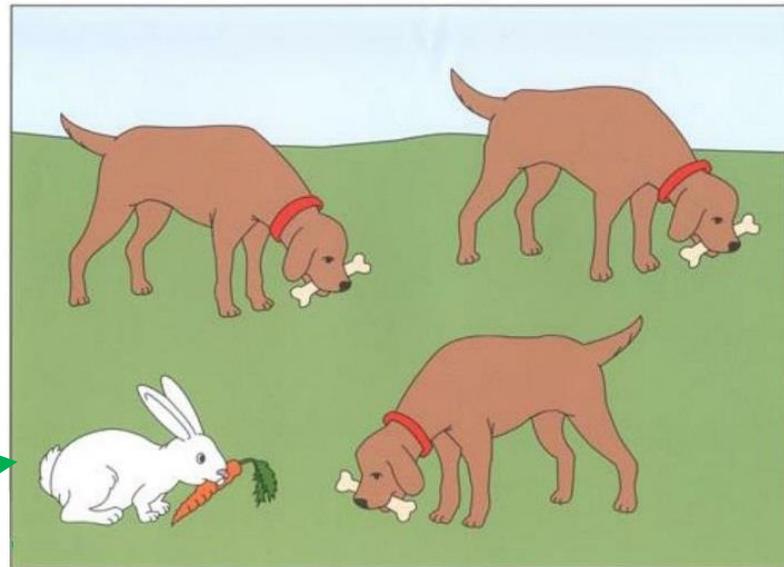
I. Offline measures

4. Sentence–picture matching tasks

- two stimuli simultaneously presented
- participants have to judge whether an utterance is a proper description of a picture



Roeper, Strauss & Pearson: (bunny spreading)
Is every dog eating a bone?



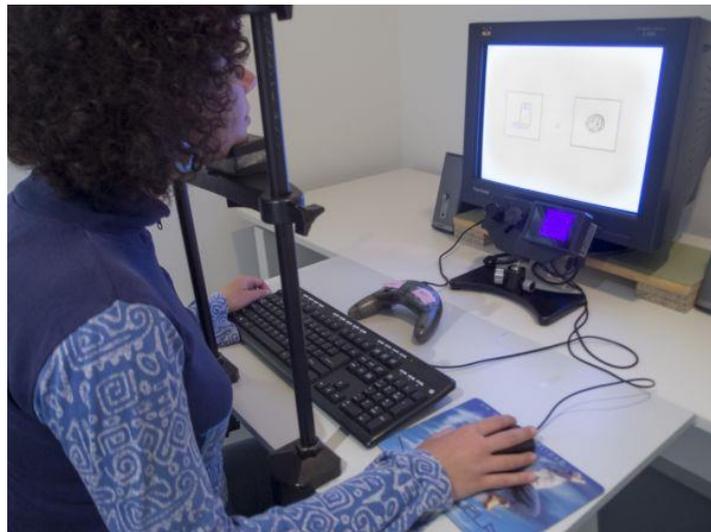
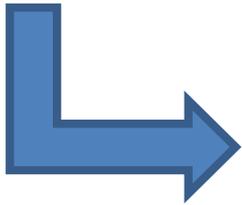
No, not that one.

II. Online measures

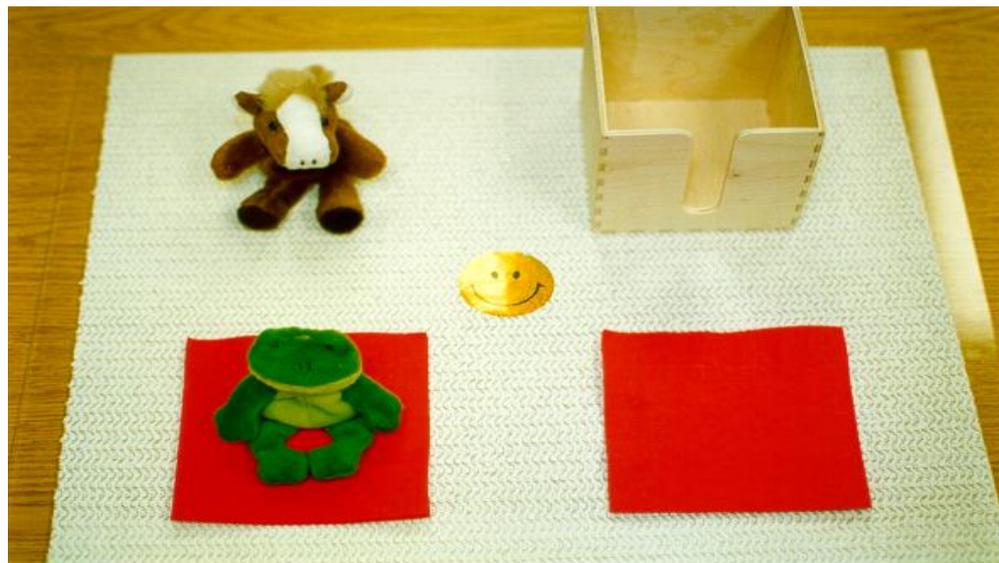
1. Eye-tracking

- ⊙ cameras monitor **eye movement** and then computers calculate where the eyes fixate on a visual display and for how long
- ⊙ environment is not so natural, but responses are still mostly unconscious
- ⊙ suitable for **reading** and also for processing auditive stimulus with respect to **picture(s)**

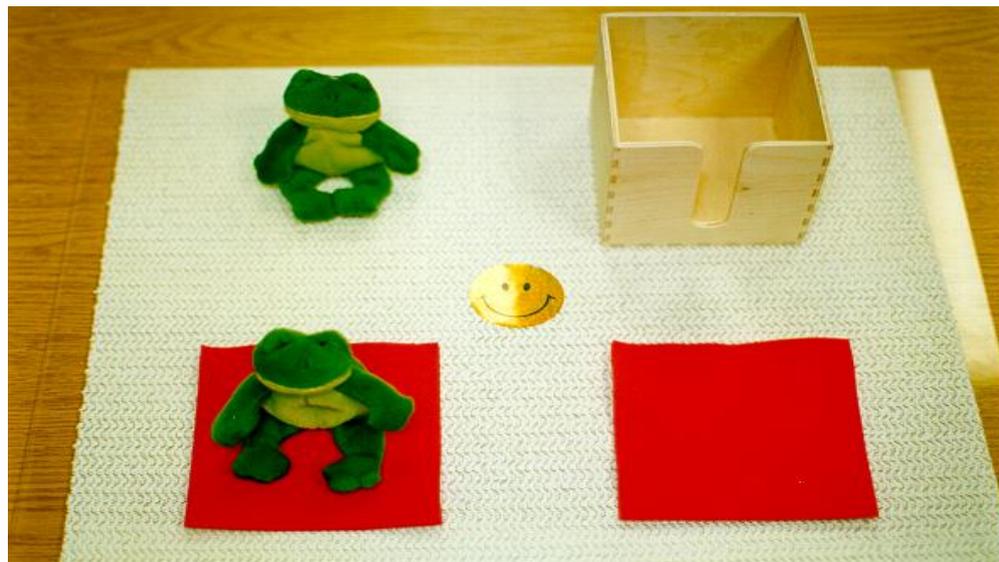
The evolution of eye-trackers



Put the frog on the napkin in the box.



one-referent
context — supports
the interpretation
of the napkin as a
destination



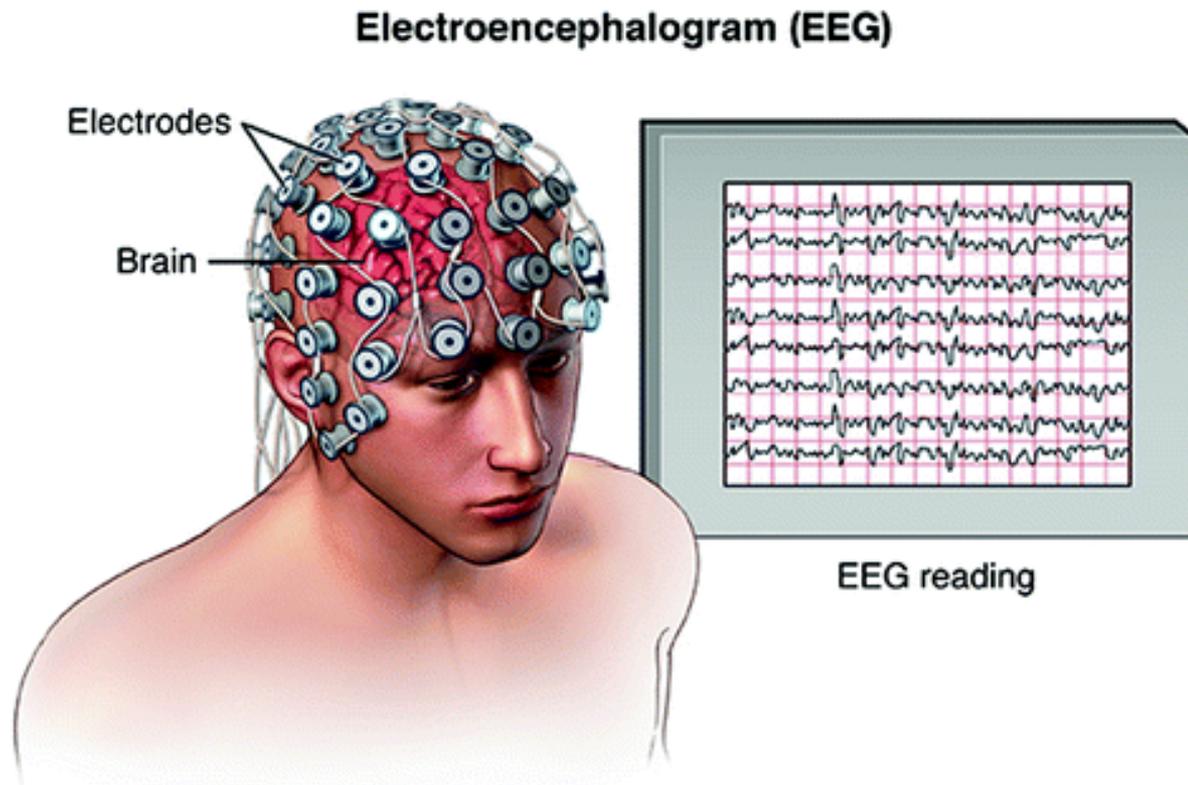
two-referent
context — supports
the interpretation
of the napkin as a
modifier

Trueswell et al. (1999)

II. Online measures

2. Event-Related Brain Potentials

- electrical activity of the brain can be recorded by an **electroencephalogram (EEG)**



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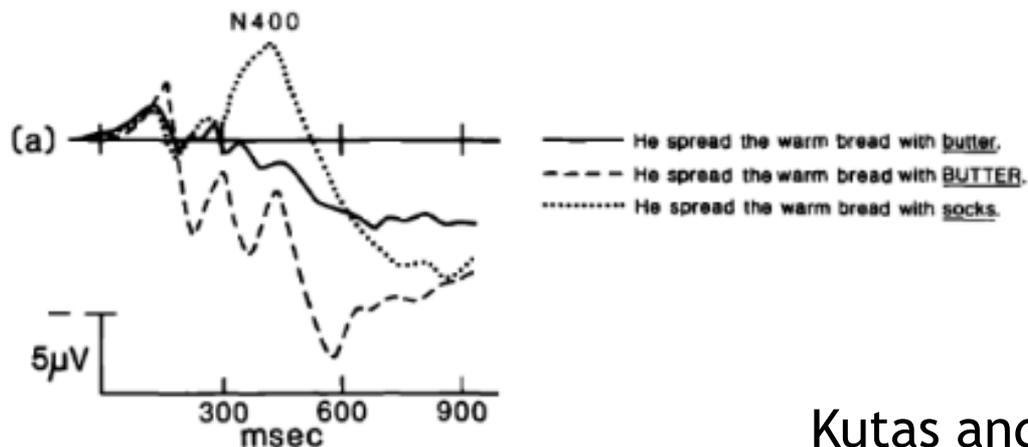


II. Online measures

2. Event-Related Brain Potentials

- ⦿ electrical activity of the brain can be recorded by an **electroencephalogram (EEG)**
- ⦿ unexpected, semantically odd words and constructions have similar results: **N400** component (negative, peak at 400 ms)

The impact of semantic and physical deviation



Kutas and Hillyard (1980, 1984)

II. Online measures

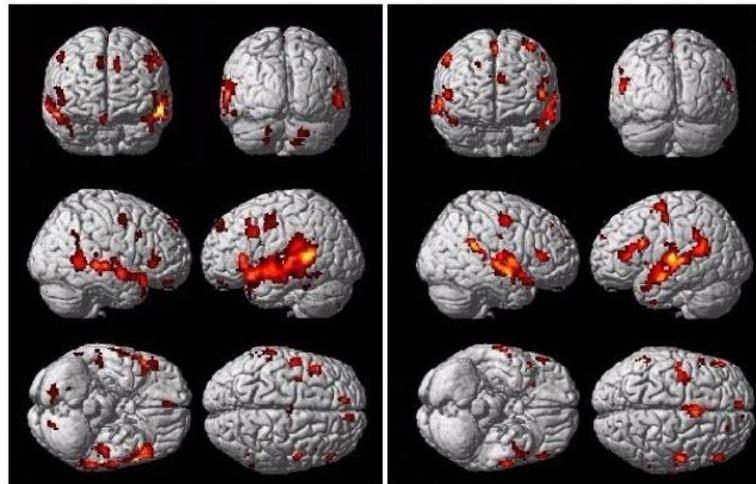
2. Event-Related Brain Potentials

- ⊙ electrical activity of the brain can be recorded by an **electroencephalogram (EEG)**
- ⊙ unexpected, semantically odd words and constructions have similar results: **N400** component (negative, peak at 400 ms)
- ⊙ syntactic violations result in a **P600** component
- ⊙ reveals the **time course** of language processes
- ⊙ **limitations:**
 - ~ cannot locate the signal in the brain
 - ~ there is usually some „noise”

II. Online measures

3. Functional Magnetic Resonance Imaging (fMRI)

- provide data about **active brain areas** during certain tasks (activation is measured by changes in blood oxygen level)
- **precise location**, but: blood flow changes are relatively slow → not exactly a real time measure



Practice 1.

- ◉ Which research method(s) would you use to test the following question?

Does native speakers of English interpret *some* as 'not all'?



Practice 1.

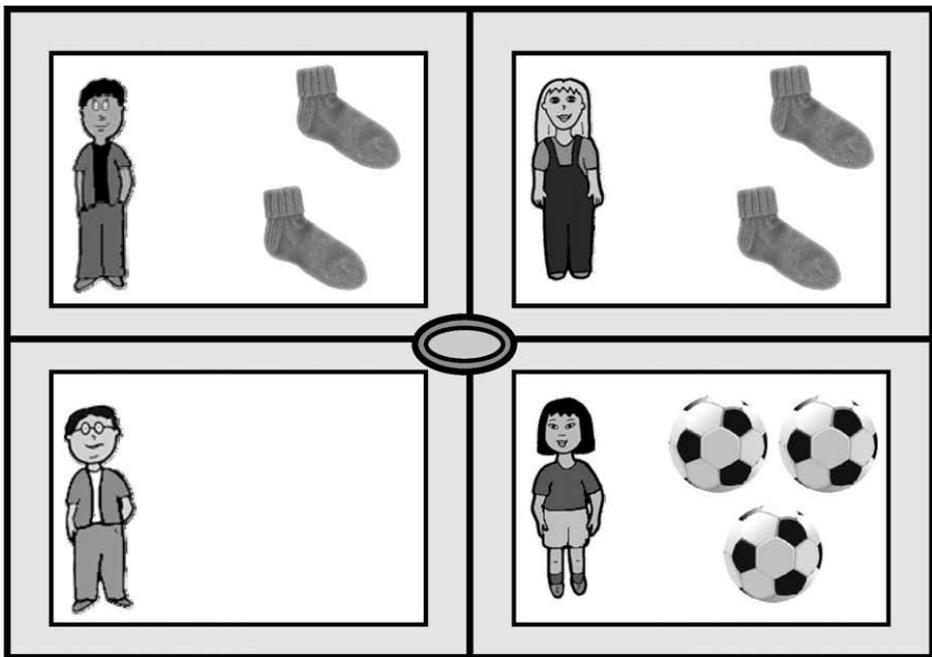
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Does native speakers of English interpret *some* as 'not all'?

- ◉ questionnaire
- ◉ sentence–picture matching
- ◉ self-paced reading
- ◉ fMRI or EEG
- ◉ eye-tracking

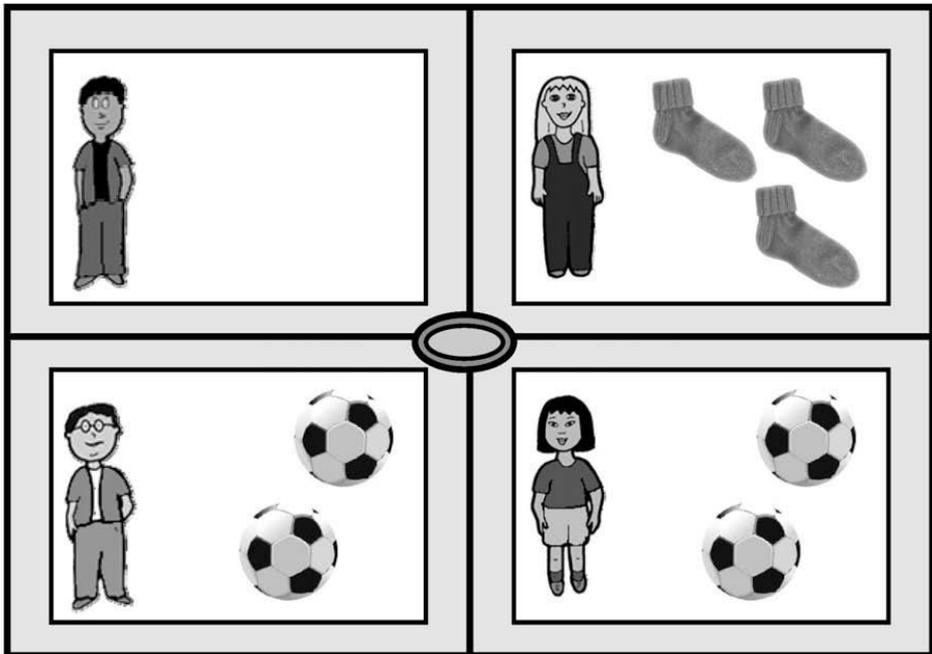


A



Point to the girls who has some/two of the socks.

B



Point to the girls who has all/three of the socks.

Practice 2.

- ◉ Which research method(s) would you use to test the following question?

If you hear a sentence like “*Bob took his ATM card and went to the bank*”, do you – even for a moment – interpret “bank” as a piece of land next to a body of water?

(Cowles 2010 : 22)



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(Cowles 2010 : 22)

- ◉ self-paced reading
- ◉ eye-tracking
- ◉ fMRI or EEG
- ◉ measuring possible priming effects

