Methods in Psycholinguistics LINGUIST 245B

Plan for the quarter

Learn about some of the standard methodologies used in psycholinguistics by taking a dive into one specific question:

Does the processing of scalar implicatures incur a processing cost?

First few weeks

Learn to organize, implement, run, analyze, and write up a web-based experiment in accordance with best/ transparent scientific practices.

Remainder of quarter

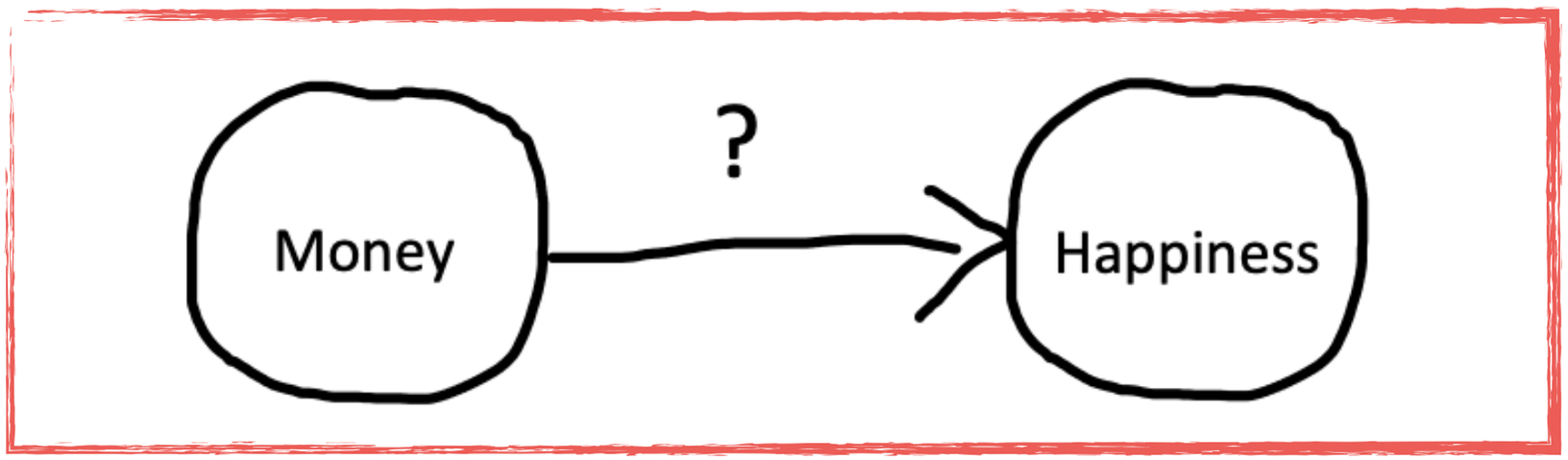
Plan for today

- **Part 1:** Experimental preliminaries
- **Part 2:** Class logistics

Why experiments?

Does money make people happy?

Hypothesized causal effect of money on happiness.



Does money cause happiness?

How do we test our hypothesis?

The problem of confounding

Correlation does not imply **causation**!

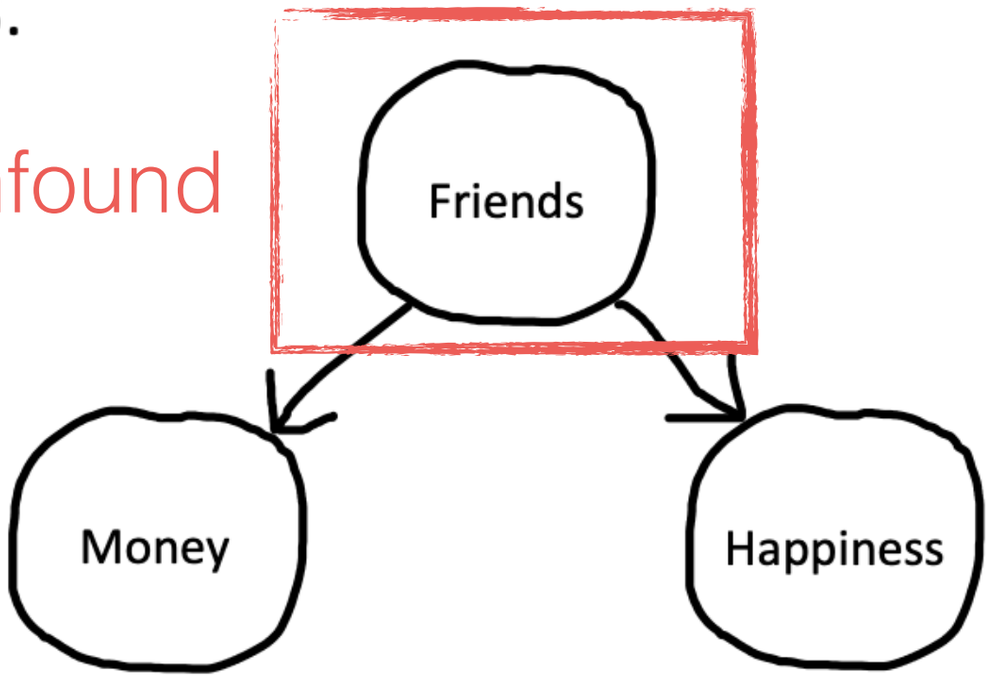
How do we test our hypothesis?

1.

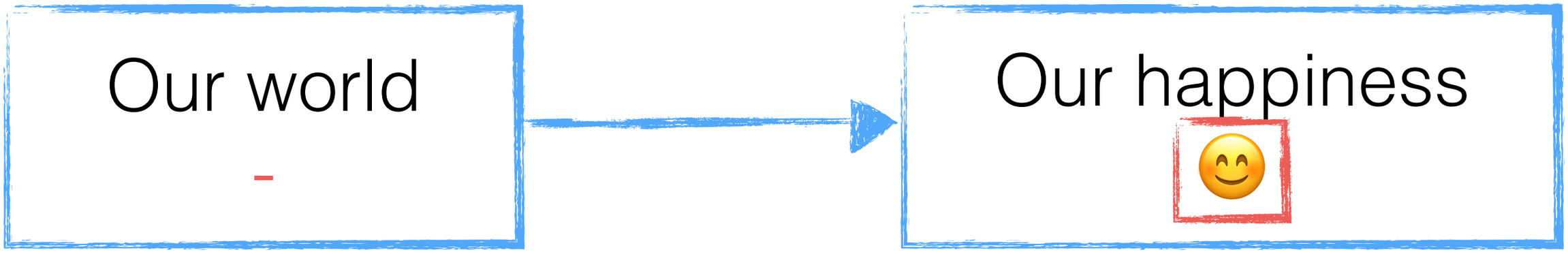
2.

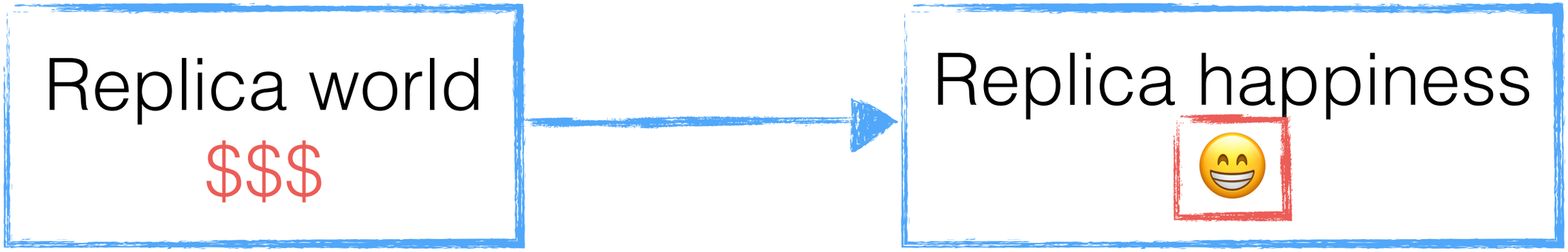
3.

Confound



(Impossible) experiment





Independent variable
(what is **manipulated**)

Dependent variable
(what is **measured**)

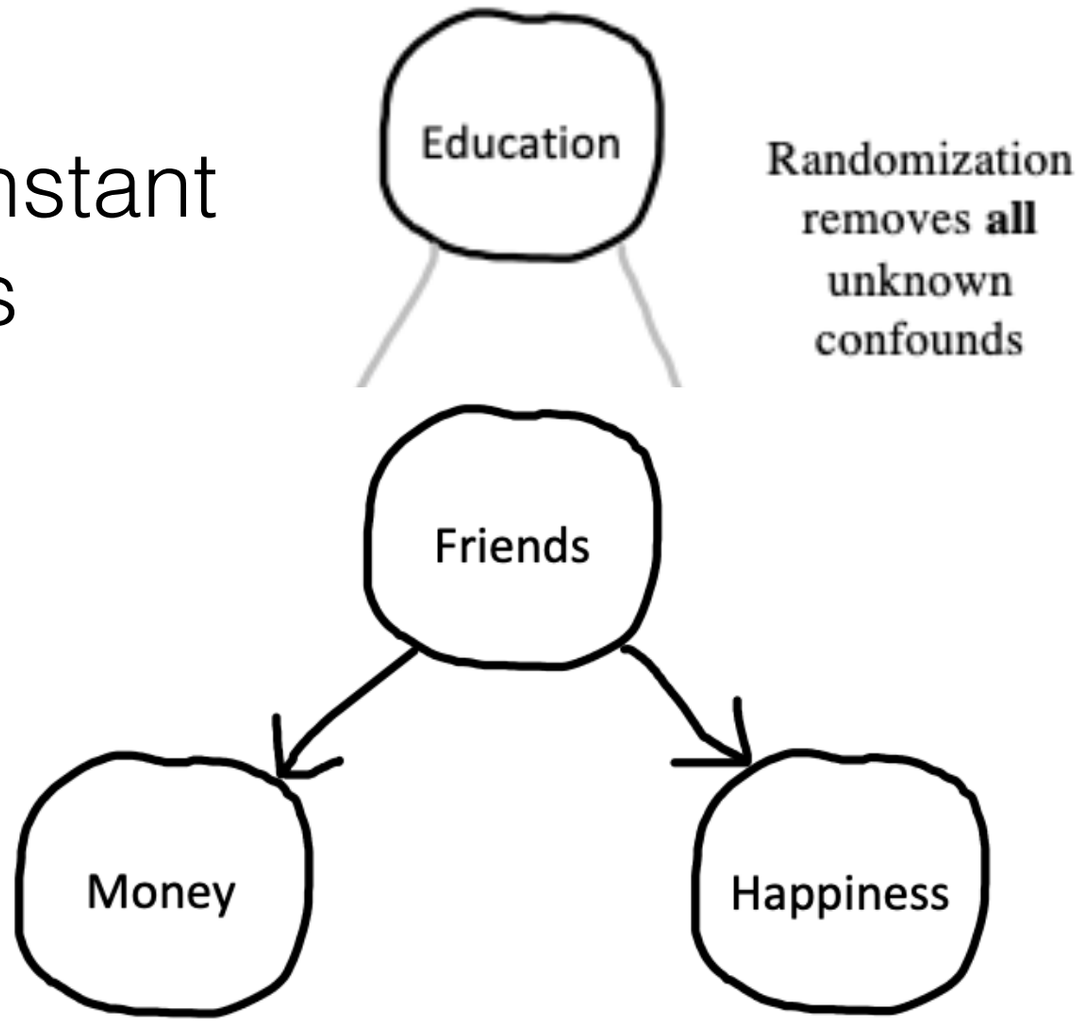
Strong evidence that money makes people happier!
(All variables **held constant** except for money.)

Problem of friend confound

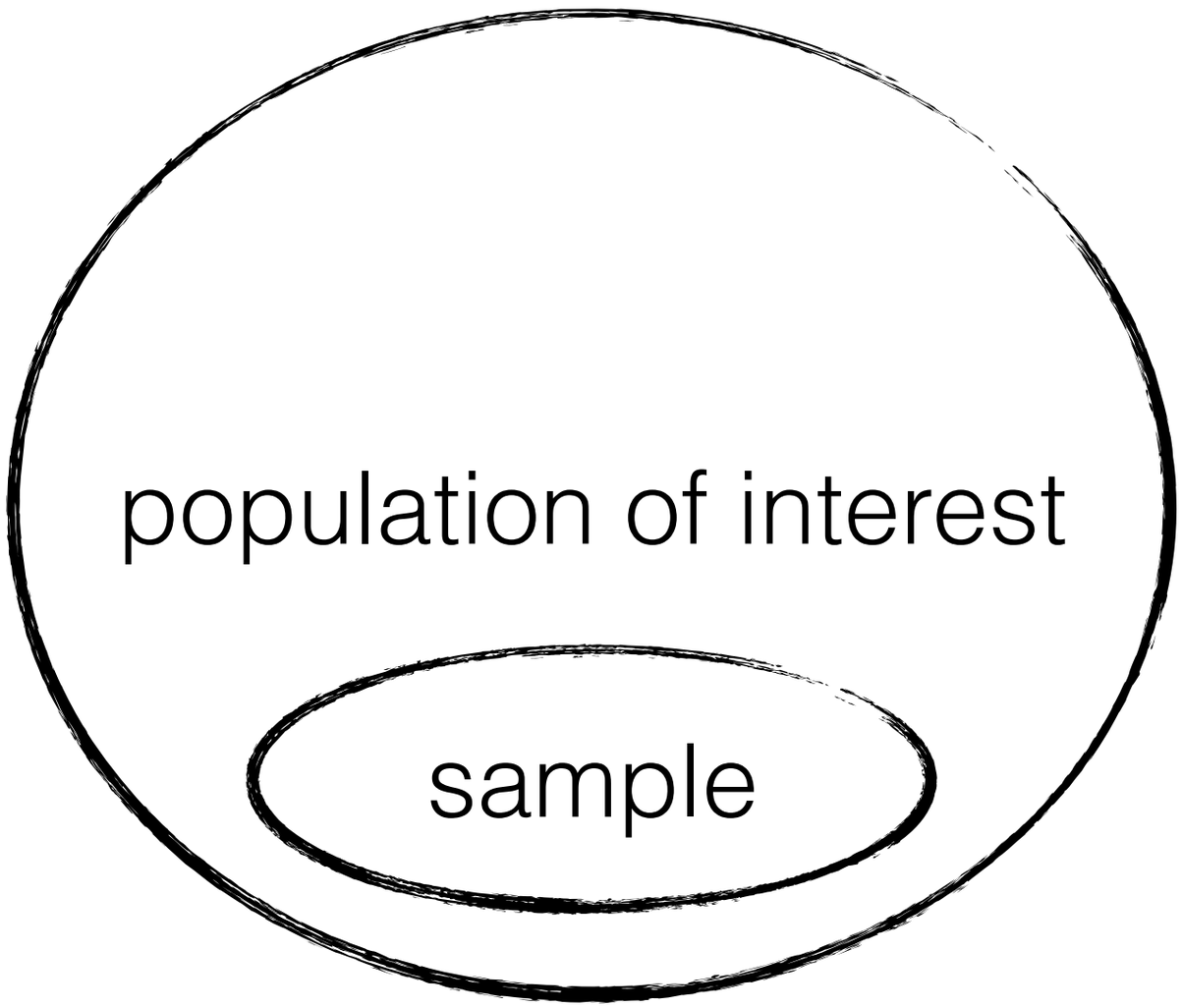
Solutions?

- hold number of friends constant
- measure number of friends

Randomization!



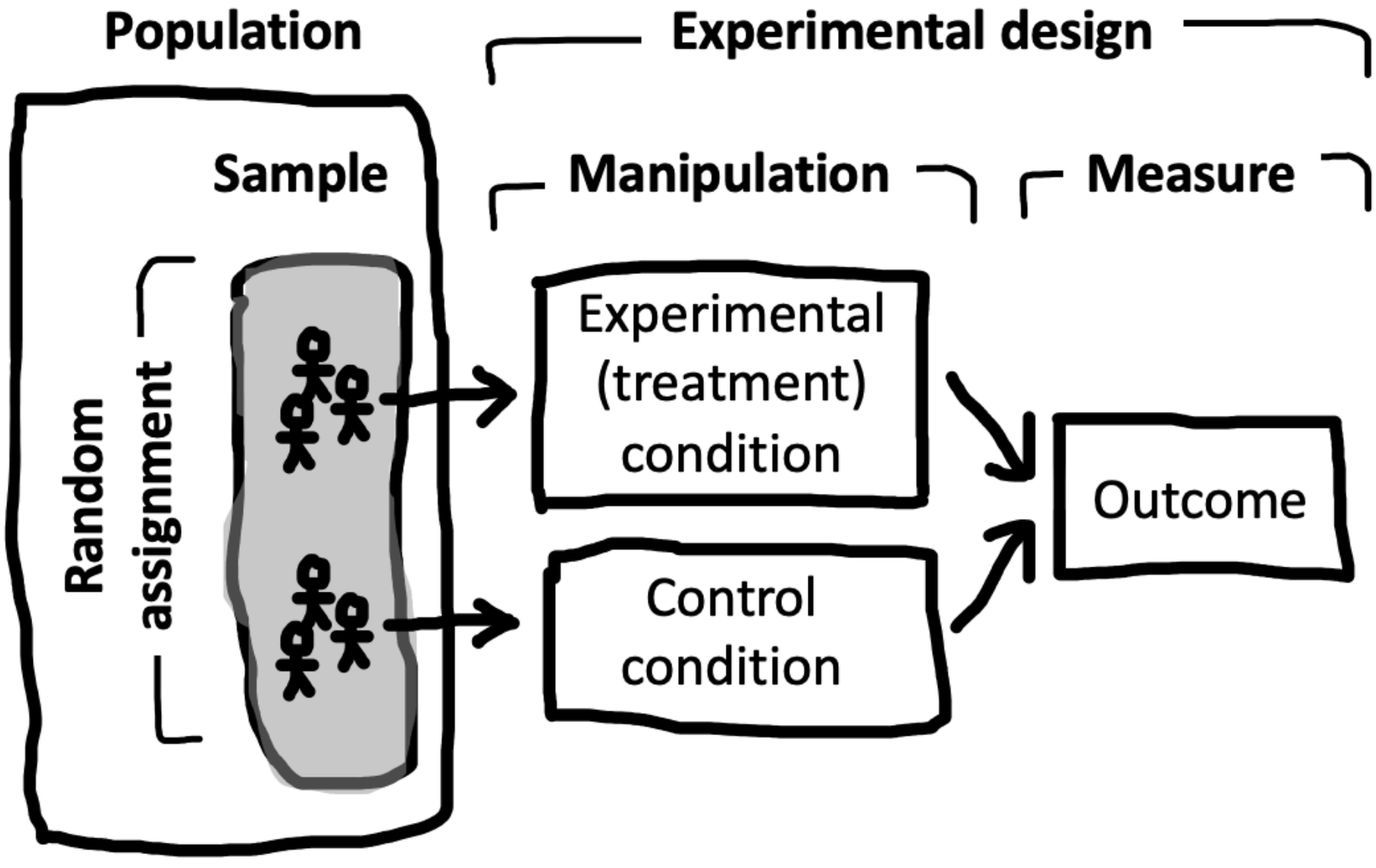
Generalizability



Do experimental results **generalize** from **sample** to **population** of interest?

Western
Educated
Industrialized
Rich
Democratic

Anatomy of an experiment



Frequent problems

- null effects
- signature data pattern thinking
- lack of explicit linking assumptions
- “My experiment didn’t work”

Tanenhaus, M.K. (2004). On-line sentence processing: past, present and, future. In M. Carreiras and C. Clifton, Jr. (eds). On-line sentence processing: ERPS, eye movements and beyond. Psychology Press, pp. 371-392.

Behavioral experiments

- Goal:
  - measure behavior to draw inferences about **representations** and **processes** (computations)
- Components:
  - method for measuring an aspect of behavior
    - task
    - response
  - model/hypotheses about underlying processes
  - **linking hypothesis** (link between measured behavior and underlying process)

Class theme:
scalar implicature processing

Behavioral measures

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Examples of responses/tasks

- Choices
- Time measures (RT)
  - response times
  - reading times
    - word recognition
      - lexical decision
      - naming
- Memory measures
  - recall
  - recognition
- Psychophysical measures
  - discrimination
  - identification
- Overt/natural behaviors
  - eye movements
  - mouse movements
  - errors
- Brain imaging
  - ERPs
  - fMRI

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Class logistics

Course website:

https://thegricean.github.io/LINGUIST245B/

Canvas only used for readings, discussions, announcements.

Some images in these slides were borrowed from:

Frank et al 2023. *Experimentology:* An Open Science Approach to Experimental Psychology Methods