

Non-experimental research:  
observational, archival, case-study research

9.63 Fall 2005

# Randomized experiments

- Experimenter randomly assigns Ss to conditions.
- Results can only be explained by
  - chance
  - the experimental manipulation

# Limitations of randomized experiments

- Randomization can be
  - impractical
  - unethical
  - expensive
- Examples:

# Limitations of randomized experiments

- Randomization can be
  - impractical
  - unethical
  - expensive
- Examples:
  - Does marijuana use cause depression?
  - How does growing up in a single-parent home affect personality?

# A choice

Well-controlled  
experiments

Grapple with the  
human condition

- Visual psychophysics
- Motor control

- Personality
- Social psychology

# Are non-experimental approaches scientific?

- Randomized experiments are rare in
  - Geology
  - Paleontology
  - Astronomy
  - Field biology

# Outline

- Observational studies
  - Everyday behavior
  - Fringe groups: cognitive dissonance
  - “The Love Lab”
- Archival studies
  - Prejudice and the Weakest Link
- Case studies

# Observational studies

- Discoveries can be made just by watching people's behavior (no interventions or experimental manipulations!)

# Everyday behavior: slips of the tongue

- Speech errors provide insight into speech production

unanimity → unamity (syllable deletion)

easily enough → easy enoughly (suffix move)

tend to turn out → turn to tend out (word exchange)

my sister went to the Grand Canyon →  
the Grand Canyon went to my sister (phrase exchange)

(Fromkin)

- Errors like these suggest that sentences are built from units at many scales (syllables, words, phrases)

# Everyday behavior: slips of the tongue

- Speech errors provide insight into semantics

1) contrasting coordinates	apple -> pear red -> blue Monday -> Tuesday
2) opposites	up -> down fat -> thin man -> woman
3) semantic cousins	Saturday -> January

(Johnston)

# Everyday behavior: slips of the tongue

- Speech errors provide evidence of unconscious motivations ?
- President of the Lower House of the Austrian parliament:
  - “Gentlemen, I take notice that a full quorum of members is present and herewith declare the sitting closed.

(Freud)

# Everyday behavior: Personal Space

- Taking the T



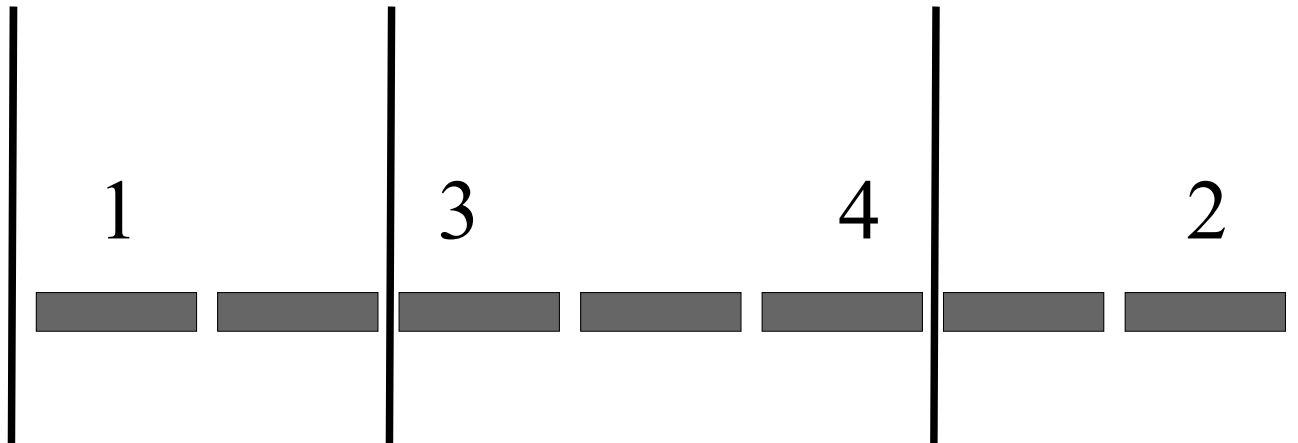
# Everyday behavior: Personal Space

- Taking the T



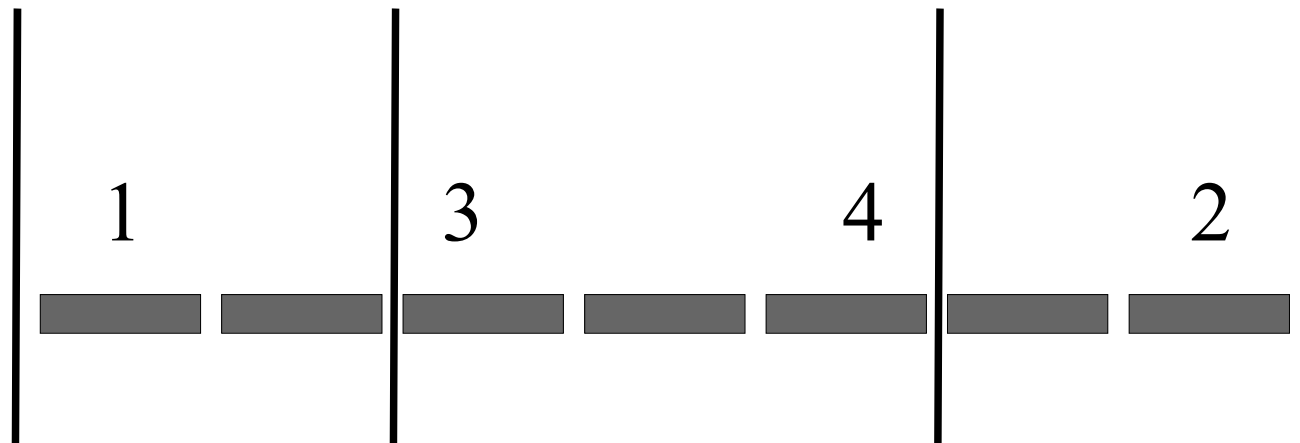
# Everyday behavior: Personal Space

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# Everyday behavior: Personal Space

- Taking the T



- Individual seats “allow” people to sit closer to each other

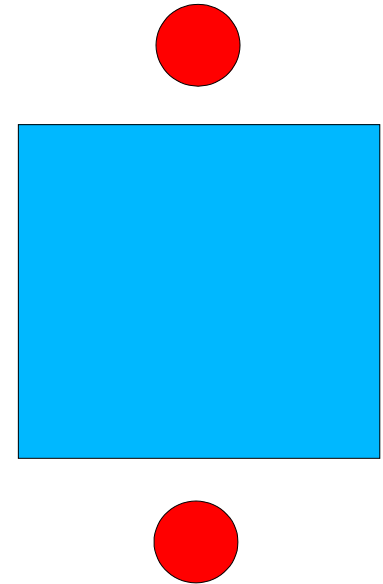
# Edward T Hall

- Proxemics: “the study of man's transactions as he perceives and uses intimate, personal, social and public space “

# Seating positions

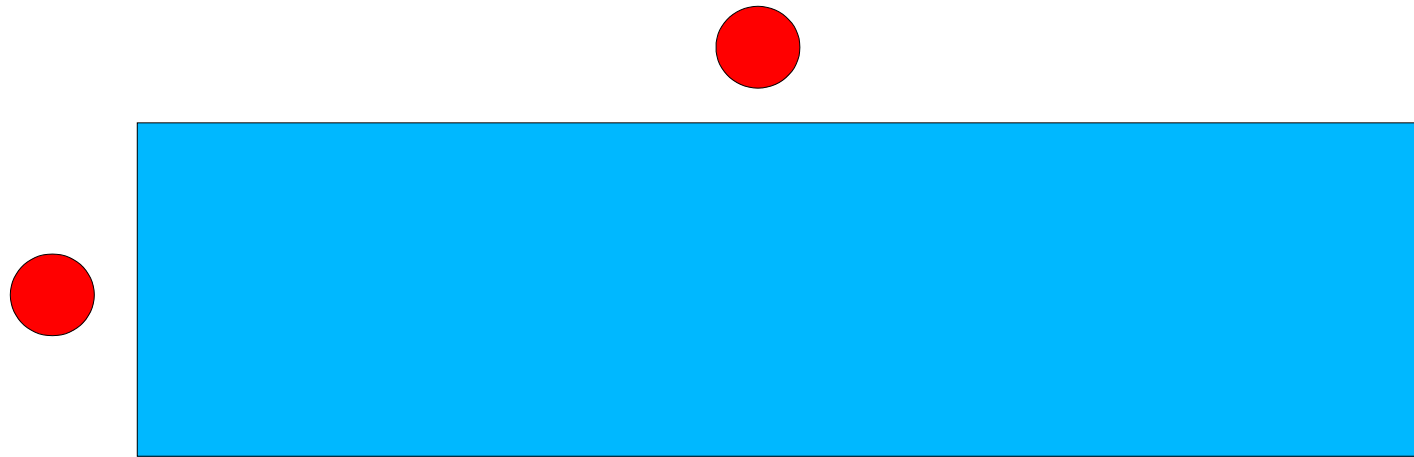


Intimate,  
Cooperative



Competitive

# High status seats



- People in high status seats
  - Talk more (even if seats are randomly assigned!)
  - Are more likely to become jury foremen.

# Territorial behavior in parking lots

- "A study of more than 400 drivers at an Atlanta-area mall parking lot found that motorists defend their spots instinctively" (AP, May 13, 1997)
- Drivers took 7 seconds longer on average if someone was waiting
- When honked, drivers took an extra 10 seconds longer to leave.
- Men were faster to leave for a high status car. Women were not.

# 2003 Literature Prize

John Trinkaus, of the [Zicklin School of Business](#), New York City, for meticulously collecting data and publishing more than 80 detailed academic reports about things that annoyed him (such as:

- What percentage of young people wear baseball caps with the peak facing to the rear rather than to the front;
- What percentage of pedestrians wear sport shoes that are white rather than some other color;
- What percentage of swimmers swim laps in the shallow end of a pool rather than the deep end;
- What percentage of automobile drivers almost, but not completely, come to a stop at one particular stop-sign;

# Everyday behavior: Trinkaus

- 1994: Wearing Baseball-Type Caps: An Informal Look

Observed 407 people wearing baseball-type caps with the peak in back in the downtown area and on 2 college campuses (1 in an inner borough and 1 in an outer borough) of a large city. About 40% of Ss in the downtown area and at the inner-borough college wore the cap with the peak to the rear, while about 10% of the outer-borough college Ss had the peak to the rear.

# Everyday behavior: Trinkaus

- 1982: Stop Sign Compliance: An Informal Look
- 1983: Stop-Light Compliance -- Another Look
- 1993: Stop Sign Compliance: A Follow-Up Look
- 1997: Stop Sign Compliance: A Final Look

# Everyday behavior

- There are revealing observations that any of us could have made if only we'd thought to look.
- Presumably there are many others left!

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# Participant-Observer research

- Researchers join the group they want to study (sometimes hiding their true motive)
- Example: “When prophecy fails”
  - Festinger, Riecken and Schachter study Marion Keech and the seekers, who predict that the world will be destroyed in a flood on December 21, 1954

# Cognitive Dissonance (Festinger)

- Cognitive dissonance:
  - Holding dissonant (inconsistent) beliefs is uncomfortable.
  - Prediction: people act to reduce dissonance whenever it is experienced

# Example: The Fox and the Grapes

Image removed due to copyright reasons.

# Cognitive Dissonance (Festinger)

- Experiment:
  - Ss were given a boring task.
  - Ss were asked to tell an incoming subject that the task was really quite interesting.
  - Half were offered \$1 for the lie – the rest were given \$20
  - Question: when asked to express how they really felt about the task, which group rated it as more enjoyable?

# Belief disconfirmation (Festinger)

- When

- A person is deeply committed to a belief
- The belief is disconfirmed
- The believer has social support

the believer often *increases* his efforts to convince others that he is correct

# Participant-Observer study

- Marian Keech and the seekers
  - Predicted a flood on December 21
  - Expected to be picked up by flying saucers
- Press release on December 22
  - “... the cataclysm was stayed by the hand of the God of Earth”

(Festinger, Riecken, Schachter: When Prophecy Fails)

# Keech and the Seekers

- Only 2 out of 11 abandoned their belief
- After December 21, the group
  - Sought the media coverage they had previously avoided
  - Welcomed outsiders to the group
  - Released tapes that had previously been considered secret

# Other apocalyptic predictions

- 1844: Millerites
- 1891: Mormons
- 1878, 1910, 1914: Jehovah's Witnesses

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# Observational work in the lab

- Bring people into the lab and scrutinize their behavior
- No manipulation of independent variables!

# Gottman's “Love Lab”

- What makes a relationship work?
- Method:
  - film couples interacting in the lab
  - Sensors measure heart rate, how much each person is sweating

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# Coding interactions

- SPAFF (Specific Affect Coding system)
  - 1. Disgust
  - 2. Contempt
  - 11. Whining
  - 13. Stonewalling
- Coders assign one number per person per second
  - Husband: 7, 7, 2, 2, 2, 2, 13, 14, ...
  - Wife : 6, 6, 6, 6, 6, 8, 12, 12, ...

# Analysis

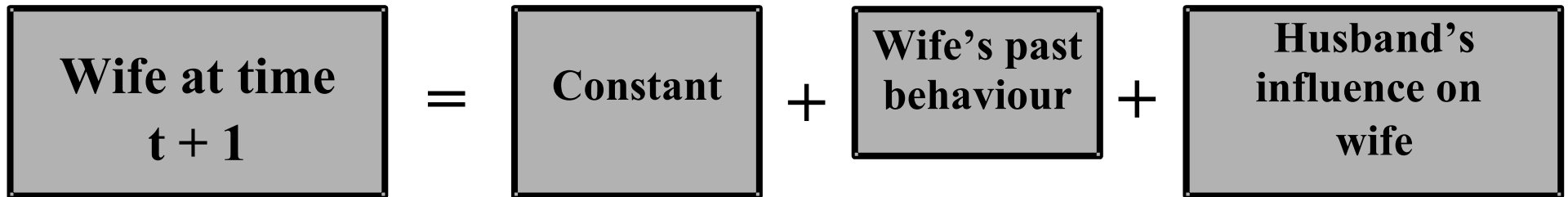
- Goals:
  - 1) Explain and understand the coded data
  - 2) Predict whether the relationship is likely to last
  - 3) Identify interventions that may help the relationship

# Early qualitative approaches

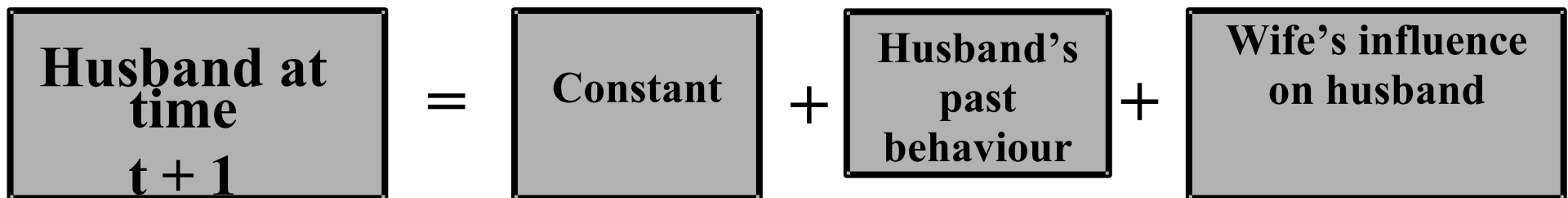
- What destroys a relationship ?
  - The “Four horseman of the apocalypse”
    - Criticism
    - Contempt
    - Defensiveness
    - Stonewalling

# Mathematical Model

(Murray)



$$W_{t+1} = a + r_1 W_t + I_{HW}(H_t)$$

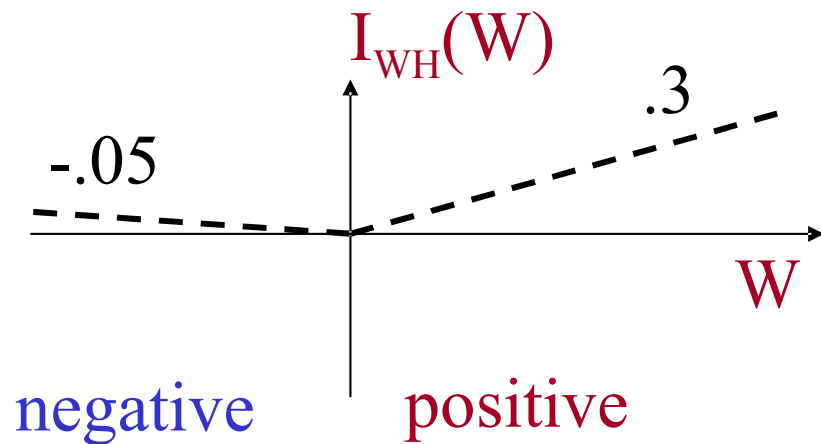


$$H_{t+1} = b + r_2 H_t + I_{WH}(W_t)$$

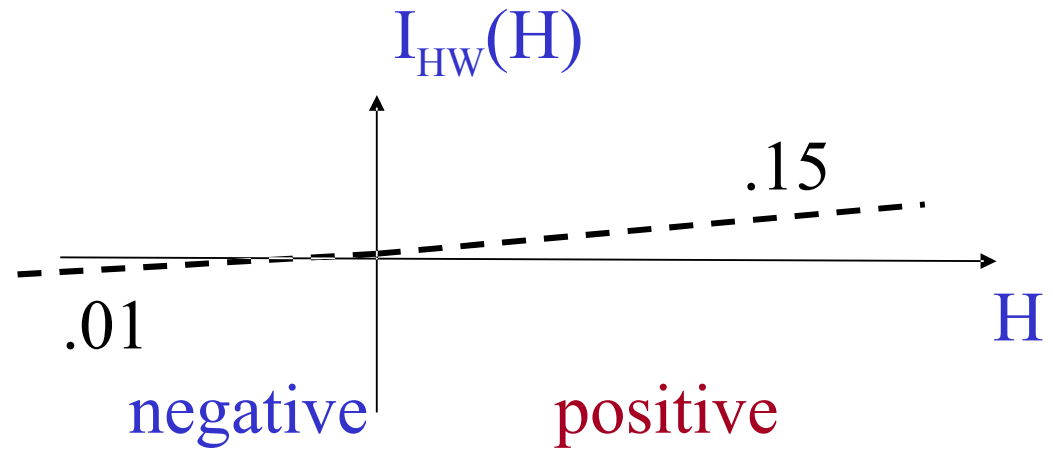
**Emotional Inertia:**  $r_1$  and  $r_2$  constants,  $|r| \leq 1$

# Conflict-Avoiding Marriage

## Conflict-Avoiding husband



## Conflict-Avoiding wife



Both have little effect  
on each other in the  
**negative** range

# Basic Marriage Types

(Murray)

## Characteristics (**s**table and **u**nstable types):

Volatile (S) – romantic, passionate, have heated arguments with cycles of fights and sex

Validating (S) – calmer, intimate, value companionate marriage, shared experience rather than individuality

Avoiders (S) – avoid confrontation and conflict, interact only in positive range of their emotions

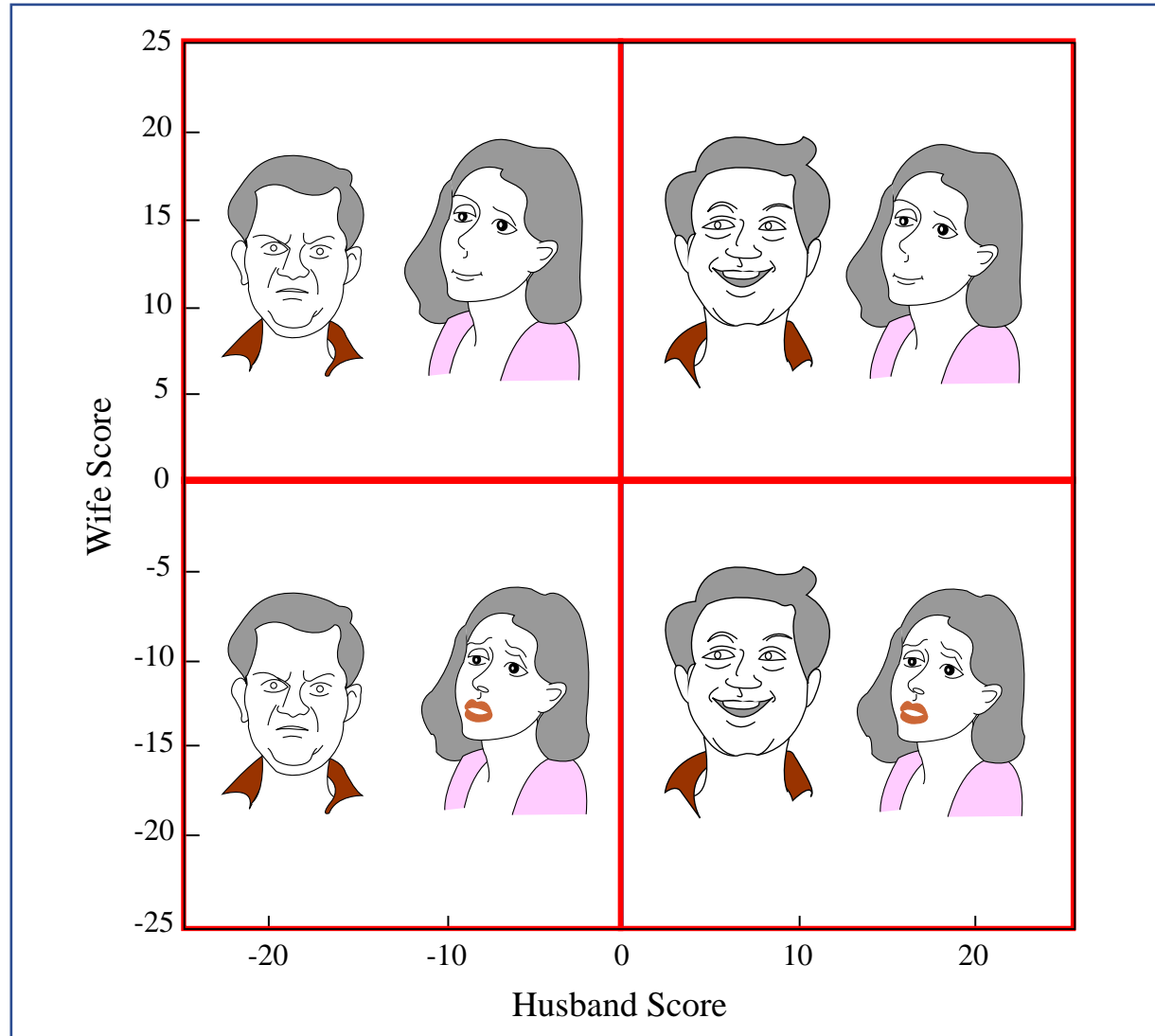
Hostile (U) – (mixed) conflict-avoiding wife, validating husband

Hostile-Detached (U) – (mixed) volatile wife, validating husband

# Relationship (H,W) Phase Space

**H unhappy  
W happy**

**H unhappy  
W unhappy**



**H happy  
W happy**

**H happy  
W unhappy**

Figure by MIT OCW.

# Predicting marriage success

- Based on a fifteen minute conversation, Gottman can predict with 90 % accuracy whether a couple will still be together in 15 years.
- Therapy: changing interaction functions

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# Archival studies

- Analyse existing datasets  
(eg census data, voting records)
- These data have sometimes been collected at great cost, and on a scale that far exceeds what a single researcher could manage.

# Discrimination

An employer is looking to fill several jobs. Given a man (M) and a woman (W) with identical resumes, suppose that he always chooses M.

- Taste-based discrimination:
  - The employer prefers not to interact with women, and will incur a financial cost to avoid such interactions
- Information-based discrimination:
  - The employer has no animus towards women, but suspects that W is actually less able than M.

# Studying discrimination

- Measuring discrimination is hard.
- Distinguishing between taste-based and information-based discrimination is hard.
- Levitt (2004) attempts to do both using data from “The Weakest Link”

# The Weakest Link

- Rules:
  - Contestants take turns to answer questions – correct answers add to the prize pool
  - One player is voted off after every round
  - At the end of the show, the two remaining contestants compete head to head for the prize pool.
- Incentives:
  - Early: vote for weak players
  - Later: vote for strong players

# Predictions:

Suppose that Bob discriminates against women:

- Taste-based:
  - Bob votes disproportionately for women in both early and late rounds
- Information-based:
  - Bob votes disproportionately for women, but only in the early rounds

# Results

No evidence of discrimination against women or blacks.

Some evidence of

- Taste-based discrimination against older players
- Information-based discrimination against Hispanics

(NB: Levitt controls for within-game performance )

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# Case studies

- Examine individual instances of some phenomenon.
  - eg HM

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# Project Prakash (Sinha et al)

- Study people who were born blind, but have had their sight restored by cataract surgery

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# Conclusions

- Experiment design is not always like choosing a recipe from a cookbook. Try to find creative ways to study the questions you care about.
- There is interesting work to be done using
  - data that are easily collected (seating patterns in subways)
  - publicly available data (The Weakest Link)

# Four Bodily distances (Hall)

- |                      |                      |
|----------------------|----------------------|
| 1) intimate          | (0 to 18 inches)     |
| 2) personal-casual   | (1.5 to 4 feet)      |
| 3) social-consultive | (4 to 10 feet)       |
| 4) public            | (10 feet and beyond) |

Personal space varies across cultures.

Europeans tend to stand closer than Americans.

# Everyday behavior: Trinkaus

- 1993: Compliance With the Item Limit of the Food Supermarket Express Checkout Lane: An Informal Look

75 15-min observations of customers' behavior at a food supermarket showed that only about 15% of shoppers observed the item limit of the express lane.... Results indicate a tendency not to play by the rules in the absence of meaningful real or imagined constraints.