Heuristics

Definition: Rules or principles that allow people to make social inferences rapidly and with reduced effort

- mental shortcuts
- rules of thumb
Social Inference

Social Inferences: 3 stages

1. Determine (ir)relevant information
2. Sample social information
3. Combine and integrate information

History of Cognitive Errors

- Up to 1960’s
  People use formal statistical rules to make social inferences

- Around 1960
  People use formal statistical rules, but imperfectly

- Around 1970
  People don’t use formal statistical rules at all
Kahneman & Tversky

Proposed 3 main ideas:

1. People rely on heuristics to make social inferences

2. Heuristics simplify the process of making social inferences

3. Heuristics sometimes lead to faulty reasoning

Kahneman & Tversky

Major shift in thinking:

- Researchers began to focus on people’s weaknesses
Representative Heuristic

Definition: categorizations made on the basis of similarity between instance and category members

Is using this heuristic always bad?

NO

An instance that IS a category member will share features with other category members.

But................
Representative Heuristic

Similarity does not ensure category membership

Category: People romantically interested in you

Features of Category Members:
- Talk with you when together
- Laugh at your jokes

Features of New Instance:
- Talks with you when together
- Laughs at your jokes

Relying solely on similarity will often lead to incorrect categorizations
Base Rate Study
Kahneman & Tversky (1973)

Purpose:

1. Show that people use the representative heuristic to make social inferences

2. Show that people fall prey to the “Base Rate Fallacy”

Base Rate Fallacy

Definition: when people do not take prior probabilities into account when making social inferences.

Example of base rate:
50% of babies are girls
50% are boys

If you estimate that your chances of having a girl is 65%, you are not using base rates to make your judgment
Base Rate Study
Kahneman & Tversky (1973)

Procedure:
1. Participants given following instructions:

Base Rate Study
Kahneman & Tversky (1973)

Manipulation: Prior probability (base rate)
1/2 participants told of the 100
  30% engineers
  70% lawyers
1/2 participants told of the 100
  70% engineers
  30% lawyers
Competing Predictions:

1. People use the representative heuristic to make social inferences

Inferences will be based solely on similarity of target to category members

Base rates (70%-30%) will be ignored

Competing Predictions:

2. People use formal statistical rules to make social inferences

Inferences will be based on similarity of target to category members AND base rates (70%-30%)
Base Rate Study
Kahneman & Tversky (1973)

Results:
Participants in the 30% condition judged Jack just as likely to be an engineer as participants in the 70% condition.

Which prediction does this support?
Why?

Conclusions:
People use the representative heuristic when making social inferences

People do not use base rates when making social inferences
When asked: “Suppose that you are given no information whatsoever about an individual chosen at random from the sample. What is the probability that this man is one of the engineers?”

**Result:** People used base rates when given no case information

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**Conclusion #2:**

People use base rates when no case information is given

People do not use base rates when case information *IS* given
Stereotypes as Base Rates

Definition of Stereotypes:

Generalized beliefs about the attributes that characterize members of a social group

Example: women tend to be passive men tend to be assertive

Stereotypes as Base Rates

Kahneman & Tversky’s study showed that base rates only influenced social inferences in the ABSENCE of case information

Locksley et al. (1980) wanted to see if the same is true for stereotypes.
**Purpose:** Test whether stereotypes act as base rates

**Stereotype:** Men are more assertive than women
Assertiveness Study
Locksley et al. (1980)

Procedures:

Step 1: Participants read about 6 targets

Step 2: Participants rated each target’s assertiveness

“How often person behaves assertively in daily life”
(0 - 100% of the time)

Assertiveness Study
Locksley et al. (1980)

Targets:

2 Targets = name only
(Susan and Paul)
Assertiveness Study
Locksley et al. (1980)

**Targets:**

2 Targets = name plus case information that was diagnostic of assertiveness

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**Example: Diagnostic case information**

The other day Nancy was in a class in which she wanted to make several points about the readings being discussed. But another student was dominating the class discussion so thoroughly that she had to abruptly interrupt this student in order to break into the discussion and express her own views.
Assertiveness Study
Locksley et al. (1980)

Targets:

2 Targets = name plus case information that was non-diagnostic of assertiveness

Example: Non-diagnostic case information

Yesterday Tom went to get his hair cut. He had an early morning appointment because he had classes that day. Since the place where he gets his hair cut is near campus, he had no trouble getting to class on time.
Assertiveness Study
Locksley et al. (1980)

Locksley et al.’s Conclusion:

Diagnostic case information reduces people’s reliance on base rates

Non-diagnostic information does not reduce people’s reliance on base rates
Dilution Effect

Locksley’s study is not consistent with the dilution effect.

Dilution Effect: the tendency for non-diagnostic information to weaken the effect of base rates on social inferences.

Recap

Diagnostic information: information that is relevant to a judgment.

GPA is diagnostic of success in graduate school.
Recap

**Non-Diagnostic information:**
information that is irrelevant to a judgment

**Eating pizza for dinner is non-diagnostic of success in graduate school**

Shock Study
Nisbett, Zukier, & Lemley (1981)

**Purpose:** Demonstrate that non-diagnostic information reduces effect of stereotypes on judgments
Pilot Study
Assessed stereotypes of college majors.

Engineering majors tolerate more electrical shock than music majors

Shock Study
Nisbett et al. (1981)

Main Study
Step 1: Read study about pain suppressant
Step 2: Read vignette of two people in pain suppressant study
Step 3: Rate how much shock each tolerated in the study
Shock Study  
Nisbett, Zukier, & Lemley (1981)

Participants in study read about  
Engineering major  
Music major

Manipulation  
Major only  
Major plus non-diagnostic information

Shock Study  
Nisbett, Zukier, & Lemley (1981)

Prediction  
Major only:  
big difference in shock tolerance, with engineer tolerating more

Major plus non-diagnostic information:  
small or no difference in shock tolerance
Note: The taller the bar, the more stereotypes influenced judgments of shock tolerance.

Shock Study
Nisbett, Zukier, & Lemley (1981)

Assertiveness Study vs. Shock Study
Locksley et al. Vs. Nisbett et al.
Opposite results:

Locksley: non-diagnostic information does NOT weaken stereotyping

Nisbett: non-diagnostic information DOES weak stereotyping
Assertiveness Study vs. Shock Study
Locksley et al. Vs. Nisbett et al.

What caused the discrepancy?

You Fill in the Answer:
Assertiveness Study vs. Shock Study
Locksley et al. Vs. Nisbett et al.

**Locksley:**
Non-diagnostic = generally useless
Got a hair cut

**Nisbett:**
Non-diagnostic = generally useful
Parent’s occupation

Clearly-irrelevant information

Not diagnostic of:
particular judgment nor of judgments in general
Pseudo-irrelevant information

Not diagnostic of particular judgment, but is diagnostic of judgments in general

Bill H. Study
Hilton & Fein, 1989

Purpose: Test whether this distinction can reconcile discrepant results

Pilot Study: Assessed stereotypes of college majors
Pre-med majors perceived as more competitive than social work majors
Bill H. Study
Hilton & Fein, 1989

Main Study:

Step 1: Participants read about Bill H.

Step 2: Participants rated his assertiveness

Manipulations:

1. College major:
   - pre-med
   - social work

2. Type of information
   - clearly irrelevant
   - pseudo-irrelevant
Predictions:

1. Clearly-irrelevant information will NOT weaken stereotyping

2. Pseudo-irrelevant information WILL weaken stereotyping
Conclusion:

Pseudo-irrelevant information dilutes stereotyping, but clearly-irrelevant information does not

This clears up the discrepancy

Summary

People use prior probabilities when:
- no case information given
- or, clearly-irrelevant case information given

People do not use prior probabilities when:
- diagnostic case information given
- or, pseudo-irrelevant case information given
Other Cognitive Errors and Biases

- Sample Size
- Regression
- Conjunction Fallacy
- Illusory Correlation
- Confirmation bias
- Availability Heuristic

Sample Size

Failure to take sample size into account when making social inferences

Pop. = 1000  \( N_1 = 900 \)  \( N_2 = 20 \)
Regression

Observed score = true ability + chance

Whenever scores are influenced by chance, observed scores will over- or underestimate one’s true ability

Regression to the Mean

- People don’t realize that......
- Very high observed score lower next time
- Very low observed score higher next time
Conjunction Fallacy

False belief that two events have greater chance of co-occurring than either event by itself

Bank Teller Study
Tversky & Kahneman (1983)

Conjunction Fallacy
Linda is 31 years old, single, outspoken, and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations. Which of the following alternatives is more probable?

A) Linda is a bank teller
B) Linda is a bank teller and active in the feminist movement
Bank Teller Study
Kahneman & Tversky (1983)

Conjunction Fallacy

Most participants picked ____

If you picked ____, you have fallen prey to the conjunction fallacy

It is not possible for two events to be more probable than one of the events by itself

Illusory Correlation

Covariation Model

Two events must co-vary to be seen as cause-effect

Steps of detecting Co-variation
Illusory Correlation

When people overestimate how strongly two events are correlated

Occur when one or more steps needed to assess co-variation goes wrong

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Illusory Correlation

What might go wrong?

Biased Sample

People often fail to realize that their sample is biased
Confirmation Bias

What might go wrong?

Confirmation biases in hypothesis testing

People often seek information that confirms rather than disconfirms their original hypothesis

Arthritis Study
Redelmeier & Tversky (1996)

Common Belief: Arthritis associated with changes in weather

Followed 18 arthritis patients for 15 months
2 x per month assessed:
  pain and joint tenderness
  weather
Correlated pain/tenderness with weather
Results:

Correlation between pain and weather near ZERO!!! in this study

Patients saw correlation that did not exist

Why? Confirmation biases in hypothesis testing............

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Arthritis Study
Redelmeier & Tversky (1996)

Noticed when bad weather and pain co-occurred, but failed to notice when they didn't.

- Better memory for times that bad weather and pain co-occurred.

- Worse memory for times when bad weather and pain did not co-occur
Availability Heuristic

Tendency for people to make judgments of frequency on basis of how easily examples come to mind.

Availability Heuristic

Works when frequency correlated with ease of coming up with examples

But, sometimes frequency not correlated with ease of coming up with examples
The Letter “R” study
Tversky & Kahneman (1973)

Asked participants: “Is letter R more likely to be the 1st or 3rd letter in English words?

Most said R more probable as 1st letter

Reality: R appears much more often as the _____ letter, but easier to think of words where R is _____ letter

(you fill in the correct answers)