Lecture Outline
Schemas Part 1

- Bottom up vs. Top Down Processing

- Schemas
  - Definition
  - Functions
  - Activation
  - Structure
Bottom-Up Processing

**Definition:** Processing of information that is driven by individual features of stimuli.

**Example:** putting a puzzle together, not knowing what the picture will be.
Top-Down Processing

**Definition**: Processing of information that is driven by past knowledge and experience.

**Example**: putting a puzzle together, knowing what the picture will be.
Schemas

**Definition:** Mental representations of knowledge.

- Preconceptions
- Theories
- Expectations
Schemas

Schemas contain two kinds of knowledge

1. Attributes
   ▲ Birds: wings, eat worms, fly
   ▲ Women: nurturing, emotional, take care of children

2. Relations among attributes
   ▲ Birds can fly because they have wings
   ▲ Taking care of children makes women nurturing
Schemas

Schemas do not have to be veridical (accurate).

Example: Stereotypes are a kind of schema and stereotypes are sometimes inaccurate.
Functions of Schemas

General Function: Help people understand incoming stimuli

Specific Functions:
- Categorize new instances
- Infer additional attributes
- Guide interpretation and attention
Function 1: Categorize New Instances

- People classify new instances into categories

- Schemas provide information about the features shared by category members
Function 2: Infer Additional Attributes

After categorization, people infer features from schema attributes

Categorization:

Inference:
Function 2: Infer Additional Attributes

Warm-Cold Study: Asch (1946)

Purposes:

- Demonstrate that some traits have stronger affect on inferences than others

- Demonstrate how people make inferences from person schemas
Warm-Cold Study: Asch (1946)

Procedure:

- Participants heard description of person
- Participants made inferences about person by selecting one trait from trait pairs
  - generous - ungenerous
  - shrewd - wise
  - dishonest - honest
  - frivolous - serious
Warm-Cold Study: Asch (1946)

Description Content:

- intelligent
- skillful
- industrious
- __ __ __ __ (cold vs. warm)  Manipulation
- determined
- practical
- cautious
Warm-Cold Study: Asch (1946)

Hypothesis: Manipulation of Warm-Cold have large effect on inferences

<table>
<thead>
<tr>
<th>Trait List</th>
<th>Warm</th>
<th>Cold</th>
</tr>
</thead>
<tbody>
<tr>
<td>generous</td>
<td>91%</td>
<td>8%</td>
</tr>
<tr>
<td>good-natured</td>
<td>94%</td>
<td>17%</td>
</tr>
<tr>
<td>sociable</td>
<td>91%</td>
<td>38%</td>
</tr>
</tbody>
</table>
**Warm-Cold Study: Asch (1946)**

**Hypothesis:** Manipulation of Polite-Blunt will have weaker effect on inferences than Warm-Cold

**Results:**

<table>
<thead>
<tr>
<th></th>
<th>Study 1</th>
<th></th>
<th>Study 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Warm</td>
<td>Cold</td>
<td>Polite</td>
<td>Blunt</td>
</tr>
<tr>
<td>generous</td>
<td>91%</td>
<td>8%</td>
<td>87%</td>
<td>33%</td>
</tr>
<tr>
<td>good-natured</td>
<td>94%</td>
<td>17%</td>
<td>91%</td>
<td>55%</td>
</tr>
<tr>
<td>sociable</td>
<td>91%</td>
<td>38%</td>
<td>91%</td>
<td>55%</td>
</tr>
</tbody>
</table>
Conclusions:

- Some traits are central in one’s schema (w-c), others are peripheral (p-b)

- People use schemas to make inferences
Function 3: Guide Interpretation and Attention

Schemas enable people to interpret ambiguous events

▲Crying = Mourning at a funeral
▲Crying = Joy at a wedding
Function 3:  
Guide Interpretation and Attention  

**Stereotypes**  
One kind of schema that people use to interpret ambiguous events
Racial Bias Study:  
Sagar & Schofield (1980)

Purpose: Demonstrate that stereotypes bias interpretation of ambiguous events

Participants: 40 African American; 40 White
Racial Bias Study:
Sagar & Schofield (1980)

Procedures

Participants presented with four ambiguous drawings:

• bumping
• requesting food
• poking
• taking a pencil
Racial Bias Study: Sagar & Schofield (1980)

Procedures

Participants rated actor’s behavior as.....

- mean
- threatening
- playful
- friendly
Racial Bias Study:  
Sagar & Schofield (1980)

<table>
<thead>
<tr>
<th>Participant Race</th>
<th>Actor Race</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>White</td>
</tr>
<tr>
<td>White</td>
<td>White</td>
</tr>
</tbody>
</table>
Racial Bias Study:  
Sagar & Schofield (1980)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Actor</th>
<th>Mean &amp; Threatening</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>W</td>
<td>8.28</td>
</tr>
<tr>
<td></td>
<td>AA</td>
<td>8.99</td>
</tr>
<tr>
<td>African American</td>
<td>W</td>
<td>7.38</td>
</tr>
<tr>
<td></td>
<td>AA</td>
<td>8.40</td>
</tr>
</tbody>
</table>

**Conclusion:** White and African American participants rated identical behavior as more mean and threatening when actor was African American. Schemas influence the interpretation of events.
Washing Clothes Study:
von Hippel et al. (1993)

**Background:** Schemas facilitate memory

**Purpose of Study:**
Challenge existing thought--Can schemas inhibit memory?
Washing Clothes Study: von Hippel et al. (1993)

**Hypothesis**: Schemas inhibit memory overall, but enhance retrieval of schema-relevant info

- **Without schema**: People encode more info but have worse retrieval

- **With schema**: People encode less info but have better retrieval -- schema acts as a cue.
Washing Clothes Study: von Hippel et al. (1993)

Step 1: Participants (n = 24) read scenario.

Manipulation: Schema activation
- 1/2 participants given title: Washing Clothes
- 1/2 participants not given title

Step 2: Completed Word Fragments:
- Words from scenario, but multiple answers
- e.g., c o m _ _ _ _ _ _ _ _ complicated communicate
Washing Clothes Study:
von Hippel et al. (1993)

Dependent Variable:

- Number of word fragments solved with words from scenario
- Better memory = more word fragments solved with words from scenario
**Washing Clothes Study:**

von Hippel et al. (1993)

<table>
<thead>
<tr>
<th></th>
<th># word fragments solved with words from scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Given title</td>
<td>19</td>
</tr>
<tr>
<td>Not given title</td>
<td>22</td>
</tr>
</tbody>
</table>

**Conclusion:** Schemas can inhibit memory
Schema Functions 4 & 5:

**Function 4:** Schemas aid communication
- Schemas fill in details

**Function 5:** Schemas aid reasoning
- Can combine existing schemas to help understand conflicting information
  - e.g., Harvard Educated Carpenter
Schema Activation

1. Salience:
   - salient schemas activated before less salient schemas
Schema Activation

2. Priming:
   - Recently or frequently primed schemas activated before less recently or less frequently activated schemas

Primes: Environmental cues
   e.g., a bed primes thoughts of sleeping
Purpose:

a) show that primes can activate schemas (stereotype)

b) show that activation requires cognitive resources
Priming Study:  
Gilbert & Hixon (1991)

Participants: Female participants (n = 71)

Procedure:
- Watched video
- Experimenter showed cards with word fragments on them
- Participants completed word fragments
Priming Study: Gilbert & Hixon (1991)

Manipulations:

1. Activation of Asian Stereotype
   - Yes: Experimenter Asian
   - No: Experimenter Caucasian

2. Cognitive business
   - Busy: Rehearsed 8 digit number during video
   - Not Busy: Did not rehearse number during video
Word Fragment Task:

- Word fragments had multiple correct answers, one that was associated with Asians
  
  S_Y
  S_SORT
  RI_E
  POLI_E
  N_P

- Dependent variable: # Asian word completions
Priming Study: Gilbert & Hixon (1991)

Conclusion:
Primes can activate schema, if people have sufficient cognitive resources
Schema Activation

3. Chronic Accessibility:

- Chronically accessible schemas used more than others

- Individual differences
  - Self-defining
  - Important to one’s self-concept
4. Goals:

- People’s goals influence which schemas are activated
Feedback Study:
Fein & Spencer (1997)

Purpose: To show that goal to bolster self-esteem activates negative stereotypes

Step 1: Intelligence test
Step 2: Feedback
Step 3: State Self-Esteem scale
Step 4: Evaluate job applicant
Step 5: State Self-Esteem scale
Feedback Study:
Fein & Spencer (1997)

Manipulations:

Feedback:
- positive (93rd %)
- negative (46th %)

Schema Activation
- Job applicant = Jewish
- Job applicant = Italian
Feedback Study: Fein & Spencer (1997)

**Hypotheses:**
- **In positive feedback condition:**
  - Jewish and Italian applicant judged similarly

- **In negative feedback condition:**
  - Jewish applicant judged less favorably

- Denigrating Jewish applicant raises self-esteem
Feedback Study:
Fein & Spencer (1997)

Evaluation

Positive Feedback

Negative Feedback

Jewish
Italian

[Bar chart showing positive feedback for Jewish and Italian groups, with Jewish having higher scores.]

[Bar chart showing negative feedback for Jewish and Italian groups, with Italian having a lower score than Jewish.]
Feedback Study: Fein & Spencer (1997)

Change in Self-Esteem

![Graph showing change in self-esteem for Positive Feedback and Negative Feedback for Jewish and Italian groups]

- **Positive Feedback**
  - Jewish: 2
  - Italian: 

- **Negative Feedback**
  - Jewish: 5
  - Italian: 1
Structure of Schemas

Classical View:

There is a set of necessary and sufficient attributes needed for an instance to belong to a schema.
Classical View: Assumptions and Limitations

Assumption 1: Schemas have clear-cut boundaries

Limitation 1: Difficulty specifying defining features of instances
Classical View: Assumptions and Limitations

Assumption 2: All instances equally typical

Limitation 2: Not all members perceived as equally typical
Test of Assumption 2: All instances equally typical

Eleanor Rosch
- Typicality ratings
- Reaction times
- Production of examples
Assumption 3: Categorization of new instances simple

Limitation 3: Not all new instances are easily categorized
Probabilistic View of Schemas

Probabilistic View
- Prototype Model
- Exemplar Model

Schema
- list of typical features
- no feature necessary or sufficient
- family resemblance
Probabilistic View of Schemas

Process of Categorization

- Compare features of instance to fuzzy set of features

- Similarity = number of features an instance shares with group members

- Hi similarity = categorization as group member
Probabilistic View of Schemas

Addresses Limitations of Classical View

- Schemas do not have clear-cut boundaries
- Group members vary in typicality
- Categorization of new instances can be difficult
Prototype Model

Schemas represented as list of typical features (a prototype).

Prototype = list of features that are typical of group members

Example: Bird
- has feathers
- lives in nest
- eats worms, etc.
Prototype Model

Process of categorization:

- Match features of a new instance to prototype.
- High similarity = categorization as group member
Exemplar Model

Schemas represented as groups of specific instances (exemplars).

Exemplar = specific group members

Bird:
- robin
- crow
- hummingbird
Exemplar Model

Process of categorization:

- Match features of a new instance to exemplar.

- High similarity = categorization as group member
Impact of Probabilistic View

**DSM II:**

Depression: “an excessive reaction of depression due to an internal conflict or to an identifiable event such as the loss of a love object or cherished possession.”
Impact of Probabilistic View

**DSM IV-R:**

Depression: depressed mood for 2 years plus 2 additional symptoms
- insomnia
- appetite loss
- fatigue inability to concentrate
- low self-esteem
- loss of pleasure in activities
- restlessness
Criticisms of Probabilistic View

Criticism 1: What features to match on

Any instance can match any other instance on some features
Criticisms of Probabilistic View

Criticism 2: People have theories about relation among features

- Birds have wings and fly
- Also know that birds fly because they have wings
Raccoon Study:
Keil, 1989

**Purpose:** Demonstrated that children do not categorize on basis of feature matching alone
Raccoon Study:
Keil, 1989

Children still believed that the “skunk” was a raccoon

Conclusion: People do not engage in simple feature matching as prototype and exemplar model propose
Exam 1 Next Thursday