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

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**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:

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

Description Content:
- intelligent
- skillful
- industrious
- 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

<table>
<thead>
<tr>
<th>Results:</th>
<th>Study 1</th>
<th>Study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Warm</td>
<td>Cold</td>
</tr>
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</tbody>
</table>
Conclusions:

- Some traits are central in one's schema (w-c), others are peripheral (p-b)
- People use schemas to make inferences

Warm-Cold Study:
Asch (1946)

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

Participants rated actor's behavior as:

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

<table>
<thead>
<tr>
<th>Actor Race</th>
<th>Participant Race</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>White</td>
</tr>
<tr>
<td>White</td>
<td>African American</td>
</tr>
<tr>
<td>White</td>
<td>White</td>
</tr>
</tbody>
</table>

Subject | Actor | Mean & Threatening |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></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</td>
<td>W</td>
<td>7.38</td>
</tr>
<tr>
<td>American</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?

**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 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

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)

Results:

<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

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
Priming Study: 
Gilbert & Hixon (1991)

Purpose:

a) show that primes can activate schemas (stereotype)

b) show that activation requires cognitive resources

Participants: Female participants (n = 71)

Procedure:
- Watched video
- Experimenter showed cards with word fragments on them
- Participants completed word fragments
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

Priming Study:
Gilbert & Hixon (1991)

Word Fragment Task:
- Word fragments had multiple correct answers, one that was associated with Asians
  - S _ Y
  - S _ O R T
  - R I _ E
  - P O L I _ 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
Schema Activation

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

<table>
<thead>
<tr>
<th></th>
<th>Jewish</th>
<th>Italian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Feedback</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Change in Self-Esteem

<table>
<thead>
<tr>
<th></th>
<th>Jewish</th>
<th>Italian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Feedback</td>
<td></td>
<td></td>
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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
Classical View: Assumptions and Limitations

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

- High 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"

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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

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

**Conclusion:** People do not engage in simple feature matching as prototype and exemplar model propose

Children still believed that the “skunk” was a raccoon
Exam 1 Next Thursday