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 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:

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

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

Manipulation
Warm-Cold Study: Asch (1946)

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

**Results**:

<table>
<thead>
<tr>
<th>Trait</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>Trait</th>
<th>Study 1</th>
<th>Study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Warm</td>
<td>Cold</td>
</tr>
<tr>
<td>generous</td>
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</table>

Warm-Cold Study: Asch (1946)

**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

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**Racial Bias Study:**
Sagar & Schofield (1980)

**Purpose:** Demonstrate that stereotypes bias interpretation of ambiguous events

**Participants:** 40 African American; 40 White

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**Racial Bias Study:**
Sagar & Schofield (1980)

**Procedures**
Participants presented with four ambiguous drawings:

- bumping
- requesting food
- poking
- taking a pencil

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**Racial Bias Study:**
Sagar & Schofield (1980)

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

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

Subject Actor Mean & Threatening

<table>
<thead>
<tr>
<th>Race</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>African American</td>
<td>AA</td>
<td>8.99</td>
</tr>
<tr>
<td>African American</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

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
Primings 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 _ O R T
  - R I _ E
  - P O L I _ E
  - N _ P
- Dependent variable: # Asian word completions

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

Primings Study:
Gilbert & Hixon (1991)

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

Manipulations:

Feedback:

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

Schema Activation

- Job applicant = Jewish
- Job applicant = Italian

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

<table>
<thead>
<tr>
<th>Change in Self-Esteem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Feedback</td>
</tr>
<tr>
<td>Negative Feedback</td>
</tr>
</tbody>
</table>

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

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.

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

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

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

Exemplar Model

Process of categorization:

- Match features of a new instance to exemplar.
- High similarity = categorization as group member
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
Exam 1 Next Thursday