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 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

**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

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**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>Warm</th>
<th>Cold</th>
<th>Polite</th>
<th>Blunt</th>
</tr>
</thead>
<tbody>
<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

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**Function 3: Guide Interpretation and Attention**

Schemas enable people to interpret ambiguous events

- Crying = Mourning at a funeral
- Crying = Joy at a wedding

**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
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

White African American Participant Race
Subject Actor Mean & Threatening
White W 8.28
AA 8.99
African W 7.38
American AA 8.40

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.

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

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

Schema Activation

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

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

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

Priming Study: Gilbert & Hixon (1991)

Word Fragment Task:
- Word fragments had multiple correct answers, one that was associated with Asians
- S_Y
- S_ORT
- 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

Priming Study: Gilbert & Hixon (1991)

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

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

Classical View: Assumptions and Limitations

Probabilistic View of Schemas

Probabilistic View
- Prototype Model
- Exemplar Model

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

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

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

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