Psyc 363
Cognitive Psychology
Arlo Clark-Foos
Part IV
Representations (Schemata)

How do we represent knowledge?

Representations and Schemata

Wants pawn term dare worsted ladle gull hoe lift wetter murder inner ladle cordage, honor itch offer lodge, dock, florist. Disc ladle gull orphan worry ladle wetter putty ladle rat hut, end fur disc rasing pimple caulder Ladle Rat Rotten Hut.

Wan moaning, Rat Rotten Hut's murder colder inset: "Ladle Rat Rt t Hth ld l b k i i b d b t R o t ten H u t, heresy ladle basking winsome burden barter an shirker cockles. Tick disc ladle basking tudor cordage offer groin murder hoe lifts honor udder site offer florist. Shaker lake, dun stopper laundry wrote, end yonder nor sorghum stenches, dun stopper torque wet strainers!"

Hoe-cake, murder, resplendent Ladle Rat Rotten Hut, end tickle ladle basking an sturrered oft. Honor wrote tudor cordage offer groin murder, Ladle Rat Rotten Hut mitten anomalous woof.

"Wail, wail, wail!" set disc wicket woof, "Evanescent Ladle Rat Rotten Hut! Wares are putty ladle gull goring wizard ladle basking?"

Mural: Yonder nor sorghum stenches shut ladle gulls stopper torque wet strainers.

http://www.youtube.com/watch?v=GgQNb8DM9mY

Representations and Schemata

Top Down Processing
- Link between two worlds

System Input
- Linguistic Imagery

Please write down all of the US States that you can recall.

Measurement

- Listing of states
  - Strategies?
  - Representation

- Methods of measurement
  - Verbal Reports, Protocols
  - Errors in memory, acoustic confusions (acoustick confoosions)
  - Selective Interference (e.g., Verbal & Verbal vs. Verbal & Spatial)
  - Reaction Time (Latency)
Linguistic and Schematic Info

- Ants Passage (Bransford & Franks, 1971)
  - Number of propositions (1-4)
  - Judged test sentences to be OLD (studied) or NEW (not studied)

- Prototypes (Franks & Bransford, 1971)
  - Presented objects based on prototype
  - Prototype not shown
  - Subjects confident they had seen prototype

Schemas

- What is a schema?
  - Computer metaphor

- Four general characteristics (Rumelhart & Ortony, 1977), schemas are...
  1. Knowledge
  2. General
  3. Structured
  4. Comprehension

Characteristics of Schemas

- Bransford & Johnson (1972)

- Three groups
  - Before, After, Never (Control)

- Why did the one group perform better?

Characteristics of Schemas

- Slots
- Default Assumptions
- Embedding
- What do schemas help us do?

Restaurant Experience
Type of Schema

Deviations

Correlated Slot Values

Different levels

Script:

Restaurant

Track: Coffee Shop

Props: Tables, menus, food, check, money

Roles: Customer, cook, owner, waiter, cashier

Entry Conditions: Customer is hungry.

Customer has money.

Results: Customer has less money.

Customer is not hungry.

Owner has more money.

Scenes:

1: Entering:
Customer goes into restaurant.
Customer looks around.
Customer decides where to sit.
Customer goes to the table and sits down.

2: Ordering:
Customer picks up menu.
Customer decides on food.
Customer orders food from waiter.
Waiter tells cook the order.
Cook prepares food.

3: Eating:
Cook gives food to waiter.
Waiter gives food to customer.
Customer eats food.

4: Exiting:
Waiter writes out check.
Waiter brings check to customer.
Customer gives tip to waiter.
Customer goes to cash register.
Customer gives money to cashier.
Customer leaves restaurant.

Bower, Black, & Turner (1979)

Read 1-3 stories about visiting a Dentist.

Recognition of studied sentences did not vary as a function of number of stories read.

False Alarms and Confidence increased for foil (story-related, unstudied) sentences.

Tell me what you see in the following two slides.
Acquisition and Modification

- Ways schemas are acquired
- Ways schemas are modified
- All comes back to processing

Language Representations

- Representing individual letters
  - Format?
- Conrad’s Confusion Matrix
  - Errors are highly regular
  - Swapping representations?

Letter Representations

- 3 types of word confusions (and examples)
  - Acoustic: Hare vs. Hair
  - Semantic: Lion, Tiger, Horse → Lion, Tiger, Bear
  - Categorical: Intrusions in categorical recall

Word Representations

- Clustering in Recall (e.g., Bousfield)
- Tip of Tongue States (Brown & McNeil, 1966)
Tip of Tongue

Word Representations

- Spoonerisms and Malapropisms
- Two different kinds of representations
- What do they tell us?

SPOONERISMS (after Rev. William A. Spooner)

⇒ You have hissed all of my mystery lectures.
⇒ Easier for a camel to go through the knee of an idol.
⇒ The Lord is a shoving leopard to his flock.
⇒ Take the fleas of my cat and heave it at the house of my mother-in-law.
⇒ I assure you that the insanitary spectre has seen all of the bathrooms.

Malapropisms (after Ms. Malaprop from Sheridan's The Rivals)

⇒ My wife is as graceful as poultry in motion.
⇒ "I screamed bloody Mary." "You have a new shirt with a mammogram on the pocket."
⇒ "Well, I would not want to protrude on you."
⇒ "The minister delivered such a wonderful orgy."
⇒ "I will have you know, my son is not illiterate --- we were married three months before he was born."
⇒ "They think they might cannibalize Mother Teresa."
⇒ My mama has trouble with movie titles. She believes that she has seen: 'Green Fried Potatoes', 'Field and Stream', 'Anne of Green Acres', and 'Riding Miss Daisy.'
⇒ One test question asks: What would you do if you found someone unconscious on the street? The client responded in all seriousness: 'I would administer artificial insemination.'
⇒ My 8-year-old son excitedly told his friend about our new home: 'We live in a condom!'

Jackie Sachs

A wealthy manufacturer, Matthew Boulton, sought out the young inventor.

1. Identical
2. Formal Change
   ...sought the young inventor out.
3. Passive/Active Change
   The young inventor was sought out by a wealthy manufacturer, Matthew Boulton.
4. Semantic Change
   The young inventor sought out a wealthy manufacturer, Matthew Boulton.

1,2,3 = Same Semantics (e.g., Same Meaning)
4 = Different Semantics

Sentence Representations

- 2 different kinds of models
  - Situational vs. Text
  - Gist vs. Verbatim
- What information do we keep and what do we lose?
Sentence Representations (Brewes, 1977)

- The python caught the mouse.
- John caught the mouse.
- John caught the ball.
- John was caught in traffic.

- ate, killed/discard, grabbed, held up, etc.

- Pragmatic Implications (Inferences) in language comprehension
- Schemas & False Alarms

Text Representations (Montland & Clark, 1974)

- We checked the picnic supplies. The beer was warm
- We took the beer out of the trunk. The beer was warm

- Bridging Inferences
- Meaning and Constituent Structure

Listerine?

Text Representations

- Listerine example
- Balloon and _________ examples (Bransford & Johnson, 1972)

- Role of schemas in comprehension of text

Marks and Miller

1. Accidents kill motorists on the highways.
2. Trains steal elephants around the highways.
3. Between gadgets highways the passengers steal.

1. has semantics + syntax
2. has syntax (but no semantics)
3. has neither syntax nor semantics

1 > 2 > 3

Text Representation

- Story Grammar (Thomdyke, 1977)

Structure is important for comprehension!
Summary

- Mapping of Mental Representations
- Linguistic Schemas
- Scripts
- Different Levels of Representation