Lexical items ("WORDS")

- **Words** are pairings of form and function

Aim to show:

- We retain a great deal of very specific information about how **words** are used as well as forming generalizations over those uses.
- **Words** have prototypical functions and extensions from those functions.
- Ambiguity exists, but is less common than polysemy.
- The meaning of a **word** is determined in part by what other words it contrasts with.

...WORDS

- Each **word** has its own unique function: i.e., two words are rarely, if ever, in free variation.
- **Words** acquire more abstract meanings via metaphorical extension.
- **Words** are learned on the basis of the input together with general cognitive abilities.

Definition: classical (traditional) approach to categorization

1) goes back to Greek antiquity

2) has dominated psychology, philosophy and linguistics though most of the 20th century.

Aristotle: a thing has an essence and accidental properties.

Traditional basic assumption: categories are defined in terms of a conjunction of necessary and sufficient features.

Prototype Effects:

- **Ratings:** How good an example of the category FURNITURE is X?
- **Reaction-time:** Is this an X? (Is a penguin a bird?)
- **Production-of-examples:** subjects are more likely to give best-examples first, if asked to give a list
- **Asymmetry-in-generalizations:** Subjects believed that a disease was more likely to spread from robins to ducks than from ducks to robins (on an island). (Rips 1975)
- Prototypes often correspond to cognitive reference points.
  - Americans think US is a good example of a country
  - US is similar to Mexico
  - Mexico is similar to US

...Prototype Effects:

With borderline cases, the SAME person is likely to say one day that an olive is a fruit and another day that it is not.

**priming-by-superordinates**

- task: are the 2 words the same or different?
  - furniture followed by chair chair is faster than stove stove

Learning is faster if taught on prototypical examples first.
What makes some items typical? 

Sinks are common, but they are poor examples of furniture;

Labradoodles are rare, but are good examples of dogs.

Rosch and Mervis (1975): typical items
1) tend to have the properties of other category members
2) tend not to have properties of category nonmembers.

• Implies that the contrast set involved is important

Murphy (2003):
“Why are writers so interested in saving [the classical view]?…[it] has been part of Western thinking since Aristotle. (Aristotle!) If this were a theory that you or I had made up, it would not have continued to receive this attention after the first 10 or 20 experiments showing it was wrong…

There is a beauty and simplicity in the classical view … Unfortunately, the world appears to be a sloppy place.” pg 39

Why don’t we have necessary and sufficient categories for concepts?
**Home**: where you grew up, where your family lives together, where the person currently lives, and where a person feels like he belongs, feels safe.

- Give me a call at home. (where you live now)
- Home is where the heart is. (where you feel like you belong...)
- I went home for the holidays. (where your parents live, where you grew up)
- Home is where you feel like you belong...
- Baby: young human, cute, requires care, small, elicits affection
- Baby animal: young animal
- Baby carrots: small
- To baby someone: to treat as if they required care

**How are categories represented?**

- By representation of single “best example”?
- Only by abstract “summary representation”?

  - “apple”
    - Color: red (.3)
    - Shape: round (.3)
    - Taste: sweet (.2)
    - Size: 6 +/- 2 inches (.2)

- Only by set of all remembered examples?

**Fruit?**

We seem to remember more than just a summary representation...
Dot categorization experiments
After training, subjects are best at identifying:

- Old examples
- Untrained-on prototype (prototype advantage)
- Other new examples

Also, against single prototype representation:

If you learn of two bird species, one with 3 times the size of beak of the other, which do you think is more likely to sing?

Prototype EFFECTS: uncontroversial: they exist
Prototype THEORY: all we have is a summary representation: a prototype, that we use to judge all examples?

How are categories represented?

- By representation of single “best example”?
- Only by abstract “summary representation”?
- Only by of all remembered examples?

Exemplar model: Apple

Elephant?
Elephant?

• and the less similar it is to remembered nonelephants,
  → the more typical it will be.

On exemplar view, why are typical items categorized faster (prototype advantage)?

Learning a category

• Would seem to have to remember individual examples

Exemplar memory is necessarily a partial abstraction: some dimensions are attended to more than others.

People pay attention to the features their knowledge says are the important ones. They sometimes make inferences and add info that is not witnessed in the item.

• Surely we do remember “remembered examples”….

• But we also generalize over the learned exemplars…

• Evidence from “false memory”

• Partipants study list of words: bed, rest, awake, dream, pillow

• When asked to recall words that were studied, they often erroneously recall semantically related words like sleep.

(Also true in recognition tasks).
Two members of Club Y:

Alice: likes ice cream
   Buys nails

Betty: likes to read Westerns
   Buys a swimsuit

• C condition: decide whether Christina is a member of club Y:
  • Christina: likes sherbet
    Buys wood
    Buys a towel

• D condition: decide whether Danielle is a member of club Y:
  • Danielle: likes to read Cowboy and Indian stories
    Buys wood
    Buys a towel

Both groups were then asked to rate the following features (1-7) as to their relevance to the category:

Members of Club Y:

Plays tennis
Buys a chisel
Has children
Buys sunglasses

C condition:
Christina: likes sherbet
Buys wood
Buys a towel

Members of Club Y:
• Plays tennis
• Buys a chisel
• Has children
• Buys sunglasses
C or D condition?

D condition:
Danielle: likes to read Cowboy and Indian stories
Buys wood
Buys a towel

Another problem with pure exemplar models
• seems to take away the “category-ness” of categories.

Last time: How are categories represented?
• By representation of single “best example”?

• Only by abstract “summary representation”? 
  “apple”
  • Color: red (3)
  • Shape: round (3)
  • Taste: sweet (2)
  • Size: 6 +/- 2 inches (2)

• Only by of all remembered examples?
What do we know?

- We retain information about particular instances, partially abstracted in accord with dimensions we feel are important.

- We have knowledge of both instances and generalizations.

To Lump ("prototype theory") or To Split ("exemplar-based theory")?

"Splitters see very small, highly differentiated units – their critics say that if they can tell two animals apart, they place them in different genera, and if they cannot tell them apart, they place them in different species…

Lumpers, on the other hand, see only large units - their critics say that if a carnivore is neither a dog nor a bear, they call it a cat" (Simpson, 1945).

- We remember aspects of instances we have encountered; we also relate those instances into a category based on our world knowledge.

- What we mean by “world knowledge”…

Bachelor??

Meanings exist relative to frames of knowledge
Sanity: We like our concepts to be consistent with other concepts we already have.

Social contract: We also like our concepts to agree with others' concepts.

How are word meanings represented?

- By coherent category, typically with prototype and conventionalized extensions from the prototype.
- Includes set of all remembered examples.
- Prototype and extensions are meanings that exist against a background of general world knowledge.

Of course not all words are stored

- [re+V]v: redo, revisit, remember, resist, reply, resolve...
- [N+ist]adj: constructionist, abolitionist, artist, nudist...
- We store high frequency instances of a productive pattern (also all non-compositional instances) and we generalize over those instances to form a generative template that can be extended to new items.

Another dimension of meaning

Metaphor: a cross-domain mapping

Beyond “Juliet is the sun”...
- Dr. Frankenstein brought the monster to life.
- Dr. Frankenstein gave the monster life.
- The remark threw the audience into general confusion.
- The remark brought general confusion to the audience.
- He fell into a general depression.
- He was hit by a severe depression.

**States as Locations**

- Being in a state as being in a location
- Events as sequences of locations
- Difficulties as impediments to motion
- External events as large entities
- Change as motion
- Causes as physical forces
- Actions as self-propelled movements
- Long-term purposeful activities as journeys

**States As locations**

- Dr. Frankenstein brought the monster to life.
- Dr. Frankenstein gave the monster life.
- The remark threw the audience into general confusion.
- The remark brought general confusion to the audience.
- He fell into a general depression.

**Properties As movable objects**

- Dr. Frankenstein brought the monster to life.
- Dr. Frankenstein gave the monster life.
- The remark threw the audience into general confusion.
- The remark brought general confusion to the audience.
- He fell into a general depression.

**Special cases of difficulties as impediments to motion**

- **Difficulties as barriers**
  - He had a hard time getting over the C.
  - He couldn't get around the problem.
  - She couldn't get past her troubles and move on.

- **Difficulties as burdens**
  - He carried a lot of emotional baggage around.
  - She was weighed down by a lot of responsibilities.

**Difficulties as counterforces**

**External events as large body of water**

- He dove right in
- He's not afraid to take the plunge.
- Just go with the flow.
- Couldn't fight the current.
- Swimming against the tide.
- Swimming upstream.
- Tide of history.
- A wave of conservatism.

- Based on world knowledge: oceans and rivers can be tumultuous and unpredictable; person has little control over her motion.
The evidence for the existence of a system of conventional conceptual metaphors:

- Generalizations governing polysemy, that is, the use of words with a number of related meanings.
- Generalizations governing inference patterns, that is, cases where a pattern of inferences from one conceptual domain is used in another domain.
- Generalizations governing novel metaphorical language (see, Lakoff & Turner, 1989).
- Generalizations governing patterns of semantic change (see, Sweetser, 1990).
- Psycholinguistic experiments (see, Gibbs, 1990)

- There are alternative metaphors of the same target domain;
- There is specific knowledge and there are generalizations over the specific.

**WORDS**

- **Words** are pairings of form and function
- We retain a great deal of very specific information about how words are used as well as forming generalizations over those uses.
- **Words** have prototypical functions and extensions from those functions.
- The meaning of a word is determined in part by what other words it contrasts with.

**CONSTRUCTIONS**

- **Constructions** are pairings of form and function
- We retain a great deal of very specific information about how constructions are used as well as forming generalizations over those uses.
- **Constructions** have prototypical functions and extensions from those functions.
- The meaning of a construction is determined in part by what other constructions it contrasts with.

**WORDS**

- Each word has its own unique function: i.e., two words are rarely, if ever, in free variation. (cf. homework)
- Ambiguity exists, but is less common than polysemy.
- **Words** acquire more abstract meanings via metaphorical extension.
- **Words** are not part of “UG”: must be learned on the basis of the input together with general cognitive abilities.

**Constructions**

- Each construction has its own unique function: i.e., two constructions are rarely, if ever, in free variation.
- Constructional ambiguity exists, but is less common than polysemy.
- **Constructions** acquire more abstract meanings via metaphorical extension.
- **Constructions** do not come from “UG”: must be learned on the basis of the input together with general cognitive abilities.