Quick Review

• What's our working definition of a concept?
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- What's our working definition of a concept?
- What are the challenges to the classical theory of concepts?
Lessons from Ling Anthro
STAGE 1: \{\text{LIGHT-WARM, DARK-COOL}\}
STAGE 2: LIGHT-WARM breaks down into \{WHITE, WARM\}
STAGE 3 (a): WARM breaks down into {RED, YELLOW};

- WHITE
- YELLOW
- RED
- DARK-COOL
STAGE 3 (b): DARK-COOL breaks down into {BLACK, GRUE};
STAGE 3 (c): GRUE breaks down into \{GREEN, BLUE\}
STAGE 5: BROWN added as intersection of BLACK and YELLOW

Berlin & Kay (1969)
Lessons from Ling Anthro

- Ethnosemantics: How do people conceptualize their vastly different environments?
What problem does having categories solve?
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- Categories are constructed to maximize the predictability of features.
A natural case study
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Fig. 1. Frequency distribution for number of attributes applied to each number of items/category.
A natural case study

• The internal structure of categories has a “family resemblance.”
  – Much attribute-overlap within category
  – Sparsity attribute-overlap across categories
• Family resemblance with minimal overlap aids artificial category learning.

Rosch & Mervis (1975)
How do we know that something belongs to a category?

Height
Base Diameter
Handle

(8.10)

a.  
b.  
c.  
d.  
e.  

(8.11)

a.  
b.  
c.  
d.  
e.  
How do we know that something belongs to a category?

Observations
How do we know that something belongs to a category?

Exemplar
How do we know that something belongs to a category?

Prototype
Challenges to prototype theory

• What about things that really do seem to have definitions?
  – Even number
  – Grandmother (can someone be old, gray, and kind without being a grandmother, and vice versa?)
Challenges to prototype theory

• How do concepts combine/compose? (e.g. “Pet Fish”)
  - What about structured concepts?
  - What about more complex constructs? Fodor (1981):

There may be prototypical cities (London, Athens, Rome, New York); there may even be prototypical American cities (New York, Chicago, Los Angeles), but there are surely no prototypical American cities situated on the East Coast just a little south of Tennessee. Similarly, there may be prototypical grandmothers (Mary Worth) and there may be prototypical properties of grandmothers (good, old Mary Worth). But there are surely no prototypical properties of, say, Chaucer’s grandmothers, and there are no prototypical properties of grandmothers most of whose grandchildren are married to dentists.
Challenges to prototype theory

- Many funny cases:
  - US Monarch
  - 4th Century Saxophone Quartet
  - Not a wolf
  - Frog or lamp
  - A belief
  - Piece of paper
  - Things you would take from your house in a fire
Ad hoc concepts

- Ad hoc concepts/categories – constructed “on the fly” to solve a particular goal.
  - Some examples:
    - “things you'd take out of a burning house”
    - “things to sell at a garage sale”
    - “presents you wouldn't give your mom for her birthday”
    - “words you'd be embarrassed to shout out in class”
    - “pictures you would not want printed on your underwear”
  - These have no clear prototypes, and also show graded category membership