Mental Representation of Words
- 2 representations
  - Phonological: spoken word-form (e.g., cat)
  - Semantic: meaning (e.g., furry pet that meows)
- Similar representations grouped together forming neighborhoods
  - Phonological neighborhoods: words differing by 1 phoneme
  - Semantic neighborhoods: variety of metrics (e.g., discrete association, co-occurrence, feature analysis)
- Some words have few neighbors
  - Phonological: dog (8 neighbors)
  - Semantic: cat (3 neighbors)
- Some words have many neighbors
  - Phonological: cat (27 neighbors)
  - Semantic: bird (23 neighbors)

Components of Word Learning
- Triggering: Recognition that a word is novel and thus needs to be learned
- Configuration: Creation of a new phonological and a new semantic representation as well as a link between the two
- Engagement: Formation of links between new representations and existing similar representations

Experimental Question
- Do phonological neighborhoods influence word learning?
- Do semantic neighborhoods influence word learning?
- Does the influence of neighborhoods on word learning vary depending on the type of neighborhoods (i.e., phonological vs. semantic)?

General Methods
- Participants
  - Typically developing preschool children
  - n = 25 for phonological neighborhoods study
  - n = 36 for semantic neighborhoods study
- Stimuli
  - 10 nonwords paired with 10 nonobjects
    - Manipulate one variable (i.e., phonological or semantic neighborhoods)
  - Hold other variable constant
- Procedure
  - Exposure in game format on computer
  - Test naming and referent identification at 3 timepoints
    - Prior to exposure (baseline)
    - End of exposure (learning)
    - 1-week post-exposure (retention)

Phonological Neighborhoods: Results
- 2 conditions
  - Few phonological neighbors
  - Many phonological neighbors

Semantic Neighborhoods: Results
- 2 conditions
  - Few semantic neighbors
  - Many semantic neighbors

Exposure Example
Auditory: This is a gum. Say gum. (gum). That’s a gum. Remember, it’s a gum. We’re going to play a game. Find the gum. That’s the gum. Say gum. (gum). Don’t forget the gum.
Visual: Referent Identification Example
Presented Item: Correct child response: gum
Naming Example
Presented Item: Correct child response: gum

Referent Identification Example
Visually presented item: Correct child response: gum
Auditorially presented item: Yes, that’s a gum. Remember, it’s a gum. This is a gum. Say gum. (gum).

Referent Identification Time
- Baseline
- Learning
- Retention

Phonological Neighborhoods: Stimuli
Few Phonological Neighbors
- M = 5 phonological neighbors
- M = 10 phonological neighbors

Many Phonological Neighbors
- M = 11 phonological neighbors
- M = 12 phonological neighbors

Semantic Neighborhoods: Stimuli
Few Semantic Neighbors
- M = 8 semantic neighbors
- M = 10 semantic neighbors

Many Semantic Neighbors
- M = 11 semantic neighbors
- M = 12 semantic neighbors

Phonological Neighborhoods: Results
- 10 nonwords paired with 10 nonobjects

Semantic Neighborhoods: Results
- 10 nonwords paired with 10 nonobjects

Phonological and semantic neighborhoods both affect each component as well as the timing of each component

Summary
- Phonological and semantic neighborhoods both influence learning
  - Words with few neighbors are learned better than words with many neighbors
  - Timing of influence varies
    - Phonological = early (i.e., learning)
    - Semantic = later (i.e., retention)
- Semantic neighborhoods influence later component (i.e., engagement)
  - Few neighbors = less confusability with existing representations
  - Less degradation over time over time

Hypothesis 1:
Phonological and semantic neighborhoods influence different components of word learning
- Phonological neighborhoods influence early component (i.e., triggering)
- Few neighbors = more unique
- More obvious that phonological representation does not exist
- Learning triggered with fewer exposures
- Semantic neighborhoods influence later component (i.e., engagement)
- Few neighbors = less confusability with existing representations
- Less degradation over time

Hypothesis 2:
Phonological and semantic neighborhoods influence the same component but the timing of that component varies
- Phonological and semantic neighborhoods both affect engagement but timing of engagement varies
  - Early engagement for phonological representations
  - Late engagement for semantic representations
  - Less overlap in word learning components

Future Directions
- Identify measures that are sensitive to
  - Triggering
  - Configuration
  - Engagement
- Test the role of phonological and semantic neighborhoods in each component as well as the timing of each component

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