Semantic Feature Knowledge in Aphasia: A Review of Three Studies
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Disclosure Statement

- Neither presenter has any financial or nonfinancial consideration or relationship relevant to course content that compromises or has the potential to compromise professional judgment.
Semantic Feature Treatments

- Many interventions use manipulation of features to improve word retrieval
  - (e.g., Boyle, 2004; Boyle & Coelho, 1995; Coelho, McHugh, & Boyle, 2000; Conley & Coelho, 2003; Falconer & Antonucci, 2012; Kiran, 2008; Kiran et al, 2011; Mauszycki, Wambaugh, & Cameron, 2006; Peach & Reuter, 2010; Rider, Wright, Marshall, & Page, 2008; Wambaugh & Ferguson, 2007)

- Spreading Activation Theory
  - (Collins & Loftus, 1975)
Two Feature Considerations: Importance

- High-importance = very important or necessarily true of all possible examples of the concept.
- Mid-importance = often true but not necessarily integral to the definition.
- Low-importance = may be true but not integral to the definition of the concept.

- People with aphasia have greater impairments in low-importance features compared to high-importance features (e.g., Cox, 2009)
Two Feature Considerations: Distinctiveness

- Distinctive features = true of only a small number of exemplars within a category.
- Common features = true of most exemplars within a category.
- People with aphasia are significantly more impaired in knowledge of distinctive features than common features (e.g., Vecchi, 1994).
KEY

HIC – High-importance common features
HID – High-importance distinctive features
MIC – Mid-importance common features
MID – Mid-importance distinctive features
LIC – Low-importance common features
LID – Low-importance distinctive features
Experimental Tasks

- **Unrelated Semantic Foils**
  - Determine target words

- **Feature Sorting Task**
  - Determine relative knowledge of features
  - Involves matching features to target word

- **Related Semantic Foils Task**
  - Group participants
Unrelated Semantic Foils

Pie  Cat  Bike  Desk
Unrelated Semantic Foils

- Tiger
- Necklace
- Hammer
- Strawberry
Feature Sorting Task

Strawberry  Monkey  Crayon  Unrelated

Eats bananas
Feature Sorting Task

Strawberry  Monkey  Crayon  Unrelated

Fruit
Related Semantic Foils

Dog
Cat
Squirrel
Bear
Related Semantic Foils

Strawberry  Banana  Apple  Cherry
Review of Three Studies....
Study 1: Mason-Baughman and Wallace (2012)

- Examined common and distinctive feature knowledge of 10 people with aphasia across two levels of importance (HID, HIC, LID, LIC).
Results of Study 1

- People with aphasia have impairments in distinctive feature knowledge, but not common feature knowledge.
- Performance on BDAE-3 comprehension subtests and BNT-2 were significantly correlated with identification of LID features.
- Participants who had difficulty with the Related Semantic Foils Task had greater impairment in LID features than participants who did not have difficulty with that task.
  - A similar difference was not found for HID features.
Table 1. Study 1: Results of three-way repeated-measures ANOVA (N=10)

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Significance</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
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<td>7.16</td>
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<td>0.37</td>
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<td>Group X distinctiveness</td>
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<td>0.29</td>
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<td>0.22</td>
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</tbody>
</table>
Study 2: Mason-Baughman and Wallace (in press)

- Investigated common and distinctive feature knowledge across mid- and low-importance levels for 10 people with aphasia (MID, MIC, LID, LIC).
Results of Study 2

- Participants who had difficulty with the Related Semantic Foils Task were more impaired with identification of distinctive features than those who did not have difficulty.

- No significant difference on Feature Sorting Task between MID and LID features.
Table 2. Study 2: Results of the three-way repeated-measures ANOVA (N=10)

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Mean Square</th>
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<th>Significance</th>
<th>Effect Size</th>
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</table>
**Study 3: Mason-Baughman and Wallace (in progress)**

- Investigated feature distinctiveness across three levels of importance in 12 people with aphasia (HID, HIC, MID, MIC, LID, LIC).
Results of Study 3

- Significant main effects for group, importance, and distinctiveness were found.

- People with aphasia with the greatest difficulty with the Related Semantic Foils Task also had the greatest difficulty with the identification of LID.
Table 3. Study 3: Results of three-way repeated-measures ANOVA (N=10)

<table>
<thead>
<tr>
<th>Source</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Significance</th>
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<td>1.30</td>
<td>0.62</td>
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</table>
Conclusion

- Distinctive feature knowledge contributes in a significant way to the integrity of semantic representations in people with aphasia which can influence their performance.
  - LID are the most impaired

- These findings warrant examination within semantic feature interventions.
Expansion of Findings

- Ability to sort distinctive features correlates with word retrieval abilities

- Poster Session
  - Thursday at 1:30
  - Poster Board #338
Questions?

Thank you!
Selected References


Mason-Baughman, M. B., & Wallace, S. E. (*in progress*). The role of importance and distinctiveness of semantic features in people with Aphasia: A replication study.
