Language and cognition

BCS153 Week 10.2
3/21/19
Roadmap

• More thoughts on Boroditsky’s findings
• Abstract vs. Concrete words
• Criticisms on previous research on language and thinking
• Linguistic Category Model
• Empirical evidence
  ➢ Framed-line test
Recap from last time

• Conceptual representation of objects/events tied with language ≠ Language required for all kinds of object/event representation

• Spatial metaphors (forward, toward, before, after) as a tool to talk about time

• Vertical primes (up, down) speeds up Mandarin speakers’ judgment on sentences about time.
Any exceptions to Boroditsky’s findings?

• Are there any vertical terms in English used to describe time?

Moving up one week (Cummings, 2019, personal conversation)
→ Activating your vertical concept?
→ Or only under certain contexts?

Moving down one week (?)

Coming up next week
→ Is “up” the same as in “Move up one week”?
Questions for debate...

• Do Boroditsky’s findings really reflect how speakers of different languages "think" about time, or merely reflect our "inner speech" (or "covert speech" in mind) about time?

• Is thinking the same thing as your inner speech? Are they separable?
Less language needed for concrete concepts?
Identifying lexical concepts from contextual cues

Gillette et al. (1999)

- Adults watching silent videos of mother-infant talk
- Targets: nouns and verbs (signaled by a beep)
- Task: identify the target words from the scenes
  - Each target word identified 7 times (6 contexts + 1 final guess)
Identifying lexical concepts from contextual cues

• Gillette et al. (1999)
Abstract vs. concrete concepts

- Gillette et al. (1999)
- Some sample proportion of correct responses

<table>
<thead>
<tr>
<th>Noun targets</th>
<th>Final conjecture</th>
<th>Verb targets</th>
<th>Final conjecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piggy</td>
<td>89.3</td>
<td>Go</td>
<td>3.6</td>
</tr>
<tr>
<td>Ball</td>
<td>78.6</td>
<td>Do</td>
<td>3.6</td>
</tr>
<tr>
<td>Mommy</td>
<td>3.6</td>
<td>Put</td>
<td>35.7</td>
</tr>
<tr>
<td>Hat</td>
<td>28.6</td>
<td>Come</td>
<td>75.0</td>
</tr>
<tr>
<td>Elephant</td>
<td>89.3</td>
<td>Want</td>
<td>3.6</td>
</tr>
<tr>
<td>Plane</td>
<td>100</td>
<td>See</td>
<td>10.7</td>
</tr>
<tr>
<td>Bag</td>
<td>85.7</td>
<td>Look</td>
<td>42.9</td>
</tr>
<tr>
<td>Kiss</td>
<td>7.1</td>
<td>Get</td>
<td>7.1</td>
</tr>
<tr>
<td>Toy</td>
<td>25.0</td>
<td>Turn</td>
<td>3.6</td>
</tr>
<tr>
<td>Drum</td>
<td>89.3</td>
<td>Play</td>
<td>21.4</td>
</tr>
<tr>
<td>People</td>
<td>39.3</td>
<td>Hammer</td>
<td>14.3</td>
</tr>
<tr>
<td>Nose</td>
<td>67.9</td>
<td>Have</td>
<td>0</td>
</tr>
<tr>
<td>Hole</td>
<td>57.1</td>
<td>Push</td>
<td>42.9</td>
</tr>
<tr>
<td>Daddy</td>
<td>3.6</td>
<td>Say</td>
<td>0</td>
</tr>
<tr>
<td>Music</td>
<td>39.3</td>
<td>Throw</td>
<td>85.7</td>
</tr>
</tbody>
</table>
Abstract vs. Concrete concepts

- Gillette et al. (1999)
- Some sample responses

<table>
<thead>
<tr>
<th>Noun targets</th>
<th>Response</th>
<th>Verb targets</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piggy</td>
<td>Piggy</td>
<td>Go</td>
<td>Hit</td>
</tr>
<tr>
<td>Ball</td>
<td>Ball</td>
<td>Do</td>
<td>Look</td>
</tr>
<tr>
<td>Mommy</td>
<td>Toy</td>
<td>Put</td>
<td>Put</td>
</tr>
<tr>
<td>Hat</td>
<td>Hat</td>
<td>Come</td>
<td>Come</td>
</tr>
<tr>
<td>Elephant</td>
<td>Elephant</td>
<td>Want</td>
<td>Play</td>
</tr>
<tr>
<td>Plane</td>
<td>Plane</td>
<td>See</td>
<td>Look</td>
</tr>
<tr>
<td>Bag</td>
<td>Bag</td>
<td>Look</td>
<td>Look</td>
</tr>
<tr>
<td>Kiss</td>
<td>Mouth</td>
<td>Get</td>
<td>Hold</td>
</tr>
<tr>
<td>Toy</td>
<td>Toy</td>
<td>Turn</td>
<td>Play</td>
</tr>
<tr>
<td>Drum</td>
<td>Drum</td>
<td>Play</td>
<td>Play</td>
</tr>
<tr>
<td>People</td>
<td>People</td>
<td>Hammer</td>
<td>Put</td>
</tr>
<tr>
<td>Nose</td>
<td>Nose</td>
<td>Have</td>
<td>Play</td>
</tr>
</tbody>
</table>
Interim summary

• Language influences how people talk and think about time.

• Short-term training could change how people think about time.
  ➢ Turning into long-term effect? Unclear.
  ➢ Lab effect?

• People can identify words with concrete concepts even without audio cues.
Potential problems with previous research on language and cognition

• Focus on inner representations
  ➢ How language shapes these representations
  ➢ Disembodied

• Focus on between-community (cross-linguistic) differences
  ➢ Within-community variations?
Potential problems with previous research on language and cognition

• Generalizability issue
  ➢ Domain specific
    o Color
    o Numbers
    o Time
  ➢ Language specific
  ➢ Both domain and language specific
Potential problems with previous research on language and cognition

• Boroditsky’s studies
  ➢ Time → Domain specific
  ➢ First study (in 2000): Language-specific
  ➢ Second study (in 2001): looking at bilinguals → cross-linguistic
  ➢ Both studies: within-community variations?
Previous research on language and thought
Both domain and language-specific
• Eskimo (or Inuit): 3 different words for “snow

• Piraha: “1, 2 or many” for counting
  ➔ Does it affect their arithmetic abilities?
Potential problems with previous research on language and cognition

Both domain and language specific: Piraha

Frank et al. (2008)
Linguistic Category Model (Semin et al.)

• Why this model?
  ➢ Function-based
  ➢ Universal across languages (?)
  ➢ Broader domain
  ➢ Dynamics of language use
Linguistic Category Model (Semin et al.)

Interpersonal predicates

...What is a predicate?

→ To describe subject’s properties/state, or any fact/behavior/event associated with the subject

He is running to the classroom.
I was amazed by the work she completed.
The boy couldn’t finish his homework on time.
Linguistic Category Model (Semin et al.)

• Attention-driven approach: speaker’s intent and context

Describe this event in 3 different ways
Linguistic Category Model (Semin et al.)

Interpersonal predicates

• Declarative: target of attention

• Metasemantic: scope of attention – global vs. focal
Linguistic Category Model (Semin et al.)

Major categories of Interpersonal predicates
From the least abstract to the most abstract:
• Descriptive action verbs (e.g., hit)
• Interpretative action verbs (e.g. harm, hurt)
• State verbs (e.g. shock)
• Adjectives: also least situational

→ The communicative function and purpose of each category
→ Universal hierarchy of category abstractness
Linguistic Category Model (Semin et al.)

• Evidence from Stapel and Semin (2007)
• Does exposure to action verbs vs. adjectives influence performance on a non-linguistic task?
• Priming task: reorganize words into sentences
  • Adjectives
  • Action verbs
• Main task: Framed-Line Test (FLT) (Kitayama et al. 2003)
  ...What is FLT?? How does it work??
Sidetrack a little bit now to see how FLT works...
FLT: Impact of culture on cognition

Kitayama et al. (2003)
• Contextual information in perception
• Cultural differences:
  ➢ Japanese: field dependent
  ➢ American: field independent
• Task: Framed-Line Test (FLT)
  ➢ Absolute task: same length in the original
  ➢ Relative task: same proportion of line to box as in the original
→ Americans should perform better in absolute than in relative task
Impact of culture on cognition

Kitayama et al. (2003)

Results

<table>
<thead>
<tr>
<th>Height of first frame</th>
<th>Length of line</th>
<th>Height of second frame</th>
<th>Absolute task</th>
<th>Relative task</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Japanese</td>
<td>Americans</td>
</tr>
<tr>
<td>89</td>
<td>62</td>
<td>179</td>
<td>6.8 (5.0)</td>
<td>2.2 (2.1)</td>
</tr>
<tr>
<td>102</td>
<td>29</td>
<td>153</td>
<td>3.6 (4.9)</td>
<td>2.5 (2.5)</td>
</tr>
<tr>
<td>127</td>
<td>53</td>
<td>127</td>
<td>7.1 (4.7)</td>
<td>3.8 (4.0)</td>
</tr>
<tr>
<td>153</td>
<td>87</td>
<td>102</td>
<td>9.0 (4.9)</td>
<td>6.1 (4.6)</td>
</tr>
<tr>
<td>179</td>
<td>31</td>
<td>89</td>
<td>3.6 (2.9)</td>
<td>3.8 (3.6)</td>
</tr>
</tbody>
</table>

Note. Standard deviations are in parentheses.
Linguistic Category Model (Semin et al.)

Evidence from Stapel and Semin (2007)

• Main task: Framed-Line Test (FLT) (Kitayama et al. 2003); only the absolute task; Dutch participants

• Priming result

<table>
<thead>
<tr>
<th>Measure</th>
<th>Supraliminal priming</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adjectives</td>
</tr>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td>Frame-line test</td>
<td>4.40</td>
</tr>
</tbody>
</table>
Take-home messages

• LCM accounts for language and thought by looking at the cognitive implications (attention-driven) in language use.

  ➢ Broader domain

• Each predicate category has its functions in terms of both communication and attention-attraction.
  ➢ Abstract, situational and global attention → adjectives
  ➢ Concrete and focal attention → action verbs