Can Language Affect The Way we Think?
The Linguistic Relativity Hypothesis
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What is linguistic relativity?
• The hypothesis that language influences non-linguistic thought

Discussion questions
• Does language influence the way a person thinks?
• What are the implications of this?
  – Do bilinguals have two ways of thinking?
  – Are some languages more conducive to certain types of thought?
An Exercise

• Describe this scene

An Exercise

• Grammatical requirements differ across languages
  – English requires tense
    • But Hopi or Mandarin do not
  – Russian requires:
    • Tense
    • Grammatical gender
    • Whether it ate all or just some
  – Turkish requires:
    • Whether event was witnessed or just hearsay

Languages parse the scene differently

English Spatial Categories

ON

IN
Korean Spatial Categories

KKITA ‘fit tightly’

NOHTA ‘put on horizontal surface’

NEHTA ‘put in loosely’

Shared human “hardware”

- Brains, eyes, other sensory organs

- and “software” (cognition, development)

The Big Question

Does the language you speak affect the way you think?
Sapir-Whorf Hypothesis

- Benjamin Lee Whorf (1950s)
  - Hopi vs English linguistic categories
  - No verbal tense in Hopi
  - Habitual categories/distinctions create “grooves in the mind”
  - Influence ways of perceiving and analyzing the world

“Landscape” Metaphor

Sapir/Whorf Hypothesis Cont’d

- Strong version → Linguistic Determinism
  - Language dictates thought
    - If you speak French, you THINK French
    - No real evidence for this

- Weak version → Linguistic Relativity
  - Language influences thought
    - Perception of color
    - Perception of actions
    - Conceptualization of time
    - Conceptualization of space
Reaction to Whorf

Pinker (1994)

"[T]he famous Sapir-Whorf hypothesis of linguistic determinism, stating that people’s thoughts are determined by the categories made available by their language, and its weaker version, linguistic relativity, that differences among languages cause differences in the thoughts of their speakers [...] is wrong, all wrong." (p. 57)

Who’s right?

- Test the hypothesis!
  - Empirical investigation
  - Crosslinguistic research with non-linguistic tasks
- Psycholinguistics
  - Mixture of linguistics and psychology (and other disciplines)

How is meaning stored/represented in the mind?
What is the relationship between language and thought?

Relativity “Domains”

- Object Categorization
- Spatial Reasoning
- Color
- Motion
- Speech Perception
- Time
  ...
  whatever you have a testable hypothesis for!
Experiment 1
Linguistic Judgment Task
• Look at a series of words
• For each word, write down the first three adjectives that come to mind

Boroditsky et al. (2002)

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key

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bridge
Grammatical Gender

- Grammatical gender is a linguistic category
  - keys and bridges don’t have biological gender
  - no grammatical gender in English, but common in many languages

Cross-linguistic Findings

Conclusions

- We include gender in our conceptual representation of objects
- Representations are strongly influenced by the grammatical genders in our native language

Categorizing an object as masculine or feminine may cause us to pay more attention to potentially masculine or feminine qualities
Experiment 2  
Non-linguistic Memory Task

- 2 Volunteers!
  - look at the item for 30 seconds
  - try to remember configuration
  - identify the item from a set of four items

Frames of Reference

Relative: “The fork is to the left of the spoon.”
Absolute: “The fork is to the north of the spoon.”
Languages have dominant FoRs

- **Relative**: English, Dutch, Japanese
  - viewer’s perspective
  - left, right, below, above, front, back
- **Absolute**: Arreme (Aus.), Tzeltal (Mexico)
  - external framework
  - cardinal directions, geographic terms (uphill)
  - “There’s an ant on your south leg.”

FoR Studies: Rotation Paradigm

<table>
<thead>
<tr>
<th>Relative: “Black dot below white circle”</th>
<th>Absolute: “Black dot north of white circle”</th>
</tr>
</thead>
</table>

Results

Speakers of “Relative” languages chose relative solution; “Absolute” speakers chose absolute solution
Conclusions

• The relative frame of reference was long thought to be innate and universal
  – Recent findings show that FoRs vary significantly
• Linguistic FoRs have an impact on non-linguistic spatial cognition

Absolute speakers may be absolute thinkers.

Experiment 3
Perceptual Task

• look at “target” color (top)
• which of two bottom squares matches in color?
  – left hand for left square/right hand for right
  – AS FAST AS YOU CAN!

Color Vocabularies

- Languages divide color space differently

- Russian: No generic “blue”
  - obligatory distinction between Goluboy (lighter blues) and Siny (darker blues)
Results
• Compared reaction time of English and Russian speakers
• Russian speakers faster to discriminate colors when in two different linguistic categories
  – English speakers showed no category advantage

Conclusions
• Linguistic color categories can affect basic color perception
  – color discrimination depends on conventional distinctions made in a given language

Linguistic representations “meddle” in simple objective perceptual decisions.

Theoretical Story
• Habitual distinctions in language can result in habitual thought patterns
• No evidence for linguistic determinism
  – “thinking with an accent”
  – depends on task/domain
General Conclusions

- Language structures thought in important and interesting ways
- Psycholinguistic experiments can help us determine how and when linguistic relativity effects occur

Color Judgment Study

- Can linguistic color categories affect color judgments in one language?

The task

- Choose the color of the font (ink) from a spectrum surrounding the stimulus

Phelps et al. (2012)
Stimuli

- Nonsense words
  - vorp, dax
- "Stroop" words
  - red
Hypothesis

• Judgments of nonsense words will be accurate (choose perceptual color)
• Judgments of stroop words will be “pulled” toward lexical color

Hypothesis confirmed

• Choice of chip for stroop words “pulled” towards lexical color
  – DV: chip difference between nonsense and stroop word
  – Positive chip difference
    • $F(1,75)=7.3984; p < 0.05$
Effect depends on distance from lexical color

What’s going on?

• Activation of language-specific color terms modulates color perception
• Top-down knowledge influences bottom-up perception
• Mechanism for linguistic relativity