Linguistic relativity

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UCSD Cognitive Science

COGS 1
# Languages are really different

<table>
<thead>
<tr>
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The big question

Does it matter?
The big question

Edward Sapir:

No two languages are ever sufficiently similar to be considered as representing the same social reality. The worlds in which different societies live are distinct worlds, not merely the same world with different labels attached.
The big question

Benjamin Lee Whorf:

We dissect nature along lines laid down by our native language. The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscope flux of impressions which has to be organized by our minds—and this means largely by the linguistic systems of our minds. We cut nature up, organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this way—an agreement that holds throughout our speech community and is codified in the patterns of our language [...] all observers are not led by the same physical evidence to the same picture of the universe, unless their linguistic backgrounds are similar, or can in some way be calibrated.
A key question in cognitive science

• Some aspects of how the mind works may be innate and therefore universal.
• Others may be the product of our experiences in the world, and therefore different across cultures and languages.
• Of course, not everything about our mind is innate and universal, and not everything is learned. The meaty questions are: how much of each, and how does this work?
And another

- Our different cognitive systems affect each other.
- But in order to function efficiently and consistently, they have to be encapsulated, or modular to some extent.
- How much do different cognitive systems affect one another?
Space

- Where is the man, relative to the woman?
Space

east

– Absolute frame of reference
Space

uphill

– Absolute frame of reference
Space

to her left

– Intrinsic frame of reference
Space
to the right
– Relative frame of reference
Space

• Do your language’s preferred frames of reference influence your non-linguistic cognition?

• E.g., do speakers of absolute frame-of-reference languages think about space in absolute terms more than speakers of languages that prefer relative and intrinsic reference?
Space

- Tzeltal Mayan: prefers absolute frame of reference
  - uphill
  - downhill
  - lateral
Space

- Dutch: uses absolute only for large distances
Spatial configuration of objects
Spatial configuration of objects
Space

• The language you speak appears to affect the way you recall spatial relations
Learning about spatial relations

**IN**
- Put legos in box
- Put rings in basket
- Put books in Box-covers
- Put pegs in holes

**KKITA—interlock, fit tightly**
- Put legos on another lego
- Put rings on pole

**ON**
- Put books on other books
- Put pegs on block
Preferential looking
Preferential looking

Fig. 3. The stimuli used for the two test trials in Experiments 2 and 3.
Learning about spatial relations
Time and space

(1) SPACE

zài zuòzǐ qián-bian zhàn-zhe yī ge xuéshēng
there is a student standing in front of the desk

TIME

hǔ nián de qián yī nián shì shénme nián?
what is the year before the year of the tiger?

(2) SPACE

zài zuòzǐ hòu-bian zhăn-zhe yī ge lǎoshi
there is a teacher standing behind the desk

TIME

dàxué biè yǐ-hòu wǒ yòu jìn le yánjiūyuàn
after graduating from university, I entered graduate school
Time and space

(1) SPACE

mǎo shàng shù
cats climb trees

TIME

shàng ge yuè
last (or previous) month

(2) SPACE

tā xià le shān méi yǒu
has she descended the mountain or not?

TIME

xià ge yuè
next (or following) month
Time and space

- Primes

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<thead>
<tr>
<th>Horizontal</th>
<th>Vertical</th>
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<tbody>
<tr>
<td>The black worm is ahead of the white worm.</td>
<td>The black ball is above the white ball.</td>
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Targets
- August comes later than June
- June comes earlier than August
Time and space
Time and space

\[ r = .47, \ p < .01 \]
Time and space

![Graph showing response times (RT) for English and Mandarin speakers with horizontal and vertical primes, and English speakers after training. The x-axis represents different groups, and the y-axis shows RT in milliseconds (ms secs). The graph includes error bars indicating variability.](image)
Different writing systems

- **English**: Mostly left-first
- **Chinese**: Mostly right-first
- **Taiwanese**: Mostly right-first
### Different writing systems

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Grammatical gender
Grammatical gender

<table>
<thead>
<tr>
<th>descriptions</th>
<th>ratings (+fem)</th>
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<tr>
<td>&quot;elegant&quot;</td>
<td>+2</td>
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<td>&quot;shiny&quot;</td>
<td>+1</td>
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<td>+3</td>
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<td>&quot;strong&quot;</td>
<td>-2</td>
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<td>&quot;hard&quot;</td>
<td>-2</td>
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<tr>
<td>&quot;jagged&quot;</td>
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Spanish

Germans
Summary of findings

• People perceive and recall space differently, depending on how language cuts up the world.
• Similarly, they think differently about abstract concepts like time, again depending on their language.
• Learning a language early in life leads people to seem cognitively more like native speakers.
• Even apparently superficial aspects of language, like grammatical gender, can affect the way we perceive the world.
Key questions

• Nature and nurture
  At least some aspects of perception and recall are affected by our environment during development

• Modularity
  Linguistic cognition seems intimately related to other cognitive capacities, like perception and recall
References


