Language and cognition

Course 340
2019 LSA Linguistic Institute, UC Davis

Session 6, Fri Jul 12:
Space
Schedule and readings – part 2: Sapir-Whorf hypothesis

S. 5, Tue Jul 9: The Sapir-Whorf hypothesis
Gleitman & Papafragou (2013). Relations between language and thought.

S. 6, Fri Jul 12: Space
Majid et al. (2004). Can language restructure cognition?

S. 7, Tue Jul 16: Number
Pica et al. (2004). Exact and approximate arithmetic in an Amazonian indigene group.

S. 8, Fri Jul 19: The Sapir-Whorf hypothesis and probabilistic inference
Today

• Take attendance
• Lecture, including Majid et al.
• Discussion
A useful way to organize one’s thoughts about a scientific contribution:

• Background
• Novel contribution
• Evidential basis for contribution
Background: Infants are initially sensitive to many linguistic sounds, and then zero in on those that are relevant to their native language: “use it or lose it”. Is the same true of linguistic meaning?

Novel contribution: Yes, w.r.t. the tight/loose distinction that is encoded in “basic spatial terms” (verbs) in Korean, but not in English basic spatial prepositions.

Evidential basis: 5-m.o. infants in an English-speaking environment are sensitive to spatial tight/loose - like adult Korean speakers, but unlike adult English speakers.
“Like adult Korean speakers but unlike adult English speakers, these infants detected [the tight/loose] distinction and divided a continuum of motion-into-contact actions into tight- and loose-fit categories.”

“Language learning therefore seems to develop by linking linguistic forms to universal, pre-existing representations of sound and meaning”.
Background: There are three major spatial FoRs: relative (egocentric), intrinsic (object centered), absolute (e.g. north). Much prior work privileges the relative FoR – e.g. through reference to human bodily experience as the groundwork of cognition.
**Background:** There are three major spatial FoRs: relative (egocentric), intrinsic (object centered), absolute (e.g. north). Much prior work privileges the relative FoR – e.g. through reference to human bodily experience as the groundwork of cognition.

**Novel contribution:** Across cultures, non-relative FoRs are also attested, often in parallel across language and cognition. They claim this is an instance of language restructuring cognition.

**Evidential basis:** In non-linguistic table-turning tasks, people tend to pattern in line with their native language’s preferred FoR for small-scale manipulable space.
English:
The spoon is to the **left** of the cup.
*(Viewer-centered reference frame)*
Tenejapan Tzeltal:
The spoon is to the **north** of the cup.
(*Absolute* reference frame)
Does language affect spatial thought?
Does language affect spatial thought?

Pederson et al., 1998
Does language affect spatial thought?

Pederson et al., 1998
Does language affect spatial thought?

“Position the animals the same way as before.”

Pederson et al., 1998
Does language affect spatial thought?

“Position the animals the same way as before.”

Pederson et al., 1998
Does language affect spatial thought?

“Position the animals the same way as before.”

Pederson et al., 1998
Table 1

180° rotation of subject

Table 2

Absolute solution

Relative solution

(b)

<table>
<thead>
<tr>
<th>Language</th>
<th>Absolute</th>
<th>Relative</th>
<th>Untypable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dutch</td>
<td></td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Tzeltal</td>
<td>100</td>
<td></td>
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</tbody>
</table>

Percentage of responses

TRENDS in Cognitive Sciences
Small groups: Do you agree with the authors that environment does not seem to play a critical role? Why or why not? How would you test your proposal?
Language → ? → Thought
Language  ?  Thought
A variation on the theme

Li and Gleitman, 2002.

Blinds up

Blinds down
A variation on the theme

American college students respond differently with the window blinds up vs. down.

Li and Gleitman, 2002.
**Background:** Studies of human cognition are often either uniformitarian nativist, or blank-slate empiricist – supported where possible by studying **infants**. But for spatial cognition this is not an option: the relevant cognitive skills have not yet matured.

**Novel contribution:** [Humans] inherit many of the same cognitive preferences as our primate cousins – but then go on to build cognitive structures that may diverge in various ways from this **primate base** under the influence of language and culture.

**Evidential basis:** Table-turning **across species**.
Fig. 2. Mean percentage correct (±SE) for the egocentric and geocentric conditions for both adults and children in the Dutch and Hai||om communities. Means are plotted against chance level (20%, one of five cups).

Dutch and Hai||om (hunter-gatherer, Namibia) adults and children 7-11 y.o.
Participants: Orangutans (Pongo pygmaeus), gorillas (Gorilla gorilla), bonobos (Pan paniscus), chimpanzees (Pan troglodytes), and German preschool children (mean age ~ 5 y.o).
“We find that both child and adult spatial cognition systematically varies with language and culture but that, nevertheless, there is a clear inherited bias for one spatial strategy in the great apes [including humans]. It is reasonable to conclude, we argue, that language and culture mask the native tendencies in our species.”
What have we seen?

- Tight/loose in infants: both universalist and relativist?
- Table-turning: language vs. culture vs. ecological determinism.
- Raising the blinds.
- Shared primate bias, and cultural override.
Discussion