Taking stock of the Cross-Linguistic Data:
Spatial Frames of Reference and their Effect on Thought

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What is the Effect of Language on Thought?

Let the data decide...

Linguistic Relativity

Cognitive Universalism
Case Study: Tseltal Mayan

Geocentric coordinate system:
- Uphill = “ta ajk’ol”
- Downhill = “ta alan”
- Crosshill = “ta jejch”

Minimal egocentric left/right projection:
LR body part terms: “xin” = left, “wa’el” = right
NOT extended to regions of space outside the body.

(Brown, 1994, 2006; Brown & Levinson, 1992, 1993)
Previous (Strong) Claims

**LINGUISTIC “GAP”**: NO projective Left-Right language

"...one simply cannot say in Tzeltal 'The boy is to the left of the tree', or 'Take the first turning left'..."

[Levinson, 2003: 149]

**CONCEPTUAL “GAP”**: NO Left-Right conception

"We therefore believe that there is a systematic downgrading of left/right asymmetries in Tenejapan conception..."

[Levinson, 2003: 153]

Experimental Evidence

"Which one is the same?"

**Conclusion – Linguistic Habits Account:**
Difficult to use the system that you don’t usually use in your language.

**Alternative – Pragmatic Inference Account:**
Given an open-ended task, speakers interpret it in line with their language.
Experimental Evidence

"Which one is the same?"

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<thead>
<tr>
<th>Table 1</th>
<th>Table 2</th>
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CHALLENGE 1: COMPETENCE VS. PREFERENCE

But you’re forcing people to do something unnatural!
1. Participant (P) sits in chair.
2. Experimenter (E) hides a coin in 1 of 2 boxes.
3. E blind-folds P and spins P.
4. E takes blind-fold off P.
5. P has to point to the box with the coin.

- **Egocentric**
- **Geocentric**

### CHALLENGE 1: COMPETENCE VS. PREFERENCE

#### Swivel Chair Results by Degree

<table>
<thead>
<tr>
<th>Degree</th>
<th>Egocentric</th>
<th>Geocentric</th>
</tr>
</thead>
<tbody>
<tr>
<td>90°</td>
<td>92%</td>
<td>81%</td>
</tr>
<tr>
<td>180°</td>
<td>90%</td>
<td>60%</td>
</tr>
<tr>
<td>270°</td>
<td>94%</td>
<td>81%</td>
</tr>
<tr>
<td>360°</td>
<td>94%</td>
<td>95%</td>
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See also Greenauer & Waller, 2008; Richard & Waller, 2013; Shelton & McNamara, 2001
But they could be using an alternative strategy!

### CHALLENGE 2: ALTERNATIVE STRATEGIES

<table>
<thead>
<tr>
<th></th>
<th>Maze Task</th>
<th>Animals Task</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Egocentric</strong></td>
<td><img src="image1" alt="Circles Task Table 1" /></td>
<td><img src="image2" alt="Animals Table 1" /></td>
</tr>
<tr>
<td><strong>Centric</strong></td>
<td><img src="image3" alt="Circles Task Table 2" /></td>
<td><img src="image4" alt="Animals Table 2" /></td>
</tr>
<tr>
<td><strong>Transitive Inference Task</strong></td>
<td><img src="image5" alt="Transitive Task" /></td>
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</tbody>
</table>
CHALLENGE 2: ALTERNATIVE STRATEGIES

Transitive Inference Task

Table 1

Table 2

180°

Egocentric solution

Geocentric solution

Table 1

Geocentric set-up

Egocentric set-up

% Correct

EGO

GEO

0%

10%

20%

30%

40%

50%

60%

70%

80%

90%

100%

CHALLENGE 3: CONFLICTING RESULTS

Haun et al. (2011)

#Akhoe Hai om

Semi-nomadic hunter-gatherers

Northern Namibia

Li & Abarbanell (revise & resubmit a)

Tzeltal Maya

Subsistence farmers

Chiapas, Mexico

Figure reproduced from Haun et al., 2011
CHALLENGE 3: CONFLICTING RESULTS
Abarbanell, Montana, & Li (2011); Li & Abarbanell (Revise & Resubmit a)

Tseltal Maya
Subsistence farmers
Chiapas, Mexico

WITH LR LANGUAGE WITH “THIS SIDE”

% Correct
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

“left”/“right” “this side”

Ego Geo

WITH LR LANGUAGE
WITH “THIS SIDE”

CHALLENGE 4: PHYLOGENETIC INHERITANCE

Haun et al. (2006)
Rosati (2015)

“... a common phylogenetic inheritance of a preference for allocentric spatial strategies from the ancestor shared by all four existing genera of Honimidae…”

See also Rieser, 1989; Presson & Montello, 1994; Farrell & Robertson, 1998; Simons & Wang, 1998, ...

And... Li & Abarbanell (revise & resubmit b)
What is the Effect of Language on Thought?

Let the data decide...

Linguistic Relativity

Cognitive Universalism

What is the Effect of Language on Thought?

Let the data decide...!
Where might language have an effect...?

No!
The fruit on **HIS** left. Not **YOUR** left!

See Abarbanell & Li, 2009; 2015

Wokol a’wal!
The community of Tenejapa, Chiapas, Mexico
The Escuela Primaria Bilingüe Venustiano Carranza
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