**Background**

- **Spatial frames of reference (FoRs)**
  - Conceptual coordinate systems that are projected onto **figures** and **grounds** (Talmy 2000) in order to locate and orient these objects
  - Objects may be located and oriented with respect to each other, speech participants, speaker-external landmarks, or absolute coordinate systems

- **Research methodology**
  - How do we go about studying strategies for expressing a given content (in my case, spatial relations)?

**Background: The referential communication task**

- **The referential communication task**
  - Provides speakers with stimuli that they must describe in order to complete the task
  - Yields results that allow us to observe the pragmatic strategies that speakers use in a given context

- **For example:**
  - a pair of speakers divided by an opaque screen must select and describe stimuli cards in order to make a match
  - (Clark & Wilkes-Gibbes 1986; original design as early as the 1960’s Krauss & Glucksburg)
Background: The referential communication task

- **Advantages:**
  - Provides access to speakers’ cognitive processes and discourse strategies
  - Natural conversation reduces the risk of eliciting infelicitous expressions

- **Disadvantage:**
  - Artificial situation - only language is allowed for communication
  - But, this is required for maximally explicit references

- **Used in psycholinguistic and communication research**
  - Helps to draw conclusions about interlocutors’ mental states
  - Audience design, cognitive processes, and acquisition

- **Comparative Cognitive Anthropology research group**
  - (a collaboration between Max Planck Institutes for Psycholinguistics and Evolutionary Anthropology)
  - Exploring variation in cognitive function between populations

- **Men & Tree**
  - Spatial relations
  - Picture-to-picture matching task featuring configurations of a toy man and toy tree
  - Used in psycholinguistic and communication research to help draw conclusions about interlocutors’ mental states
  - Audience design, cognitive processes, and acquisition

- **Setup of the task Men & Tree**

  (Pederson et al. 1998: 562)

- **Men & Tree problems**
  - Configurations deviate from the semantic prototype of locative descriptions
  - Suppressed object-centered FoRs
  - Stimuli consist of pictures of toys
  - Causes further difficulties for participants’ interpretation of scale
Background

Ball & Chair
- Solution to Men & Tree problems
- Referential communication task
- Designed by Mesospace
- 4 sets of 12 pictures
  - 2008 English pilot
  - 13 Mesoamerican languages
  - 2 indigenous controls
  - 3 Spanish varieties

Overview

- Background
- An aside: Interesting B&C results...
- Study Design
- Participants
- Results
- Work in progress

An Aside: Interesting B&C results...

The Principle of Canonical Orientation (POCO)

“For the intrinsic system to refer to a relatum’s intrinsic dimension, that dimension must be in canonical position with respect to the perceptual frame of orientation of the referent.” (Levelt 1996: 92)

The intrinsic FoR in action:

- ‘The ball is under the chair.’

An Aside: Interesting B&C results...

Bohnemeyer & Tucker 2010

- POCO is not always adhered to
- Yucatec speakers will still make use of a ground object’s axes and use an intrinsic type of FoR
  - even when the ground object is NOT in canonical orientation
- English speakers also do this, though not to nearly the same extent

An Aside: Interesting B&C results...

Now:

- We would like to explore this topic further, and perform quantitative analysis of the data
- BUT, the original B&C is skewed
  - Only 12 of the 48 pictures feature chairs in non-canonical orientation
  - And only 10 afford descriptions that would use a vertical relator with the intrinsic FoR
Overview

- Background
- An aside: Interesting B&C results...

Study Design

- Participants
- Results
- Work in progress

Study Design

- We need more chairs!!

- My design (preview):
  - Another 3 sets of 12 Ball and Chair pictures to serve as an extension of the original B&C
  - To date, these have been run with English speaking UB students as well as Yucatec speakers

Study Design

- Goals
  - Desire for unskewed, fully filled etic grid of ball and chair configurations
  - 48 possible arrangements:
    - 6 absolute locations of ball wrt chair (above, under, front, back, left, right)
    - 8 positions of the chair (4 standing, 4 laying face-down; facing the front, back, right, left of the scene)

Study Design

- B&C1 does not fill this grid even for the canonically positioned chairs (blue)

<table>
<thead>
<tr>
<th>Location of Ball wrt Chair</th>
<th>Above</th>
<th>Under</th>
<th>Front</th>
<th>Back</th>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canonical Chair Orientation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>X</td>
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<td></td>
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<tr>
<td>Left</td>
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<td>X</td>
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<tr>
<td>Front</td>
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<td>Back</td>
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</tbody>
</table>

| Chair Orientation           |       |       |       |      |      |       |
| Non-Canonical               |       |       |       |      |      |       |
| Right                       |       |       |       |      |      |       |
| Left                        |       |       |       |      |      |       |
| Front                       |       |       |       |      |      |       |
| Back                        |       |       |       |      |      |       |

Study Design

- Why remove these pictures from a FoR analysis?

- N.B.:
  - the 12 non-canonically positioned chairs in the original set were positioned so variously, including them in the etic grid would be problematic
Study Design

- **Extended B&C:**
  - 36 pictures - 3 sets of 12
  - 34 instantiate an etic grid configuration (yellow below)
  - 2 pictures are treated as fillers

<table>
<thead>
<tr>
<th>Location of Ball wrt Chair</th>
<th>Above</th>
<th>Under</th>
<th>Front</th>
<th>Back</th>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair Orientation</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Canonical</td>
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<td>Right</td>
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<tr>
<td>Non-Canonical</td>
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<td>Right</td>
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<tr>
<td>Front</td>
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<td>Back</td>
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</tr>
</tbody>
</table>

- **Complete cleaned B&C (CCB&C)**
  - \( B&C1 \ (48) + \text{ExtB&C (36)} - \text{fillers (36)} \)
  - 48 of these 84
    - instantiate configurations in the etic grid
    - are treated as target items (i.e., data collected in response to these is meant to be analyzed)
  - Other 36 are treated as fillers

Overview

- **Background**
- **An aside: Interesting B&C results...**
- **Study Design**
  - **Participants**
  - **Results**
  - **Work in progress**

Participants

- **4 sets of participants – two for each language**
- English 2008, English 2011 – new recruits
- **English speaking UB students, recruited from LIN classes**
  - **B&C1 (2008) run with 10 dyads**
    - Of the 5 coded, 3 are “monolingual” English dyads
    - 2 dyads have a bilingual English-Spanish
  - **ExtB&C (2011) run with 27 dyads**
    - 8 were monolingual English dyads
    - 5 were coded
Overview

- Background
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- Study Design
- Participants

Results

- Work in progress

Data processing

- Descriptions of each picture are broken down into propositions
- Propositions describing...
  - Orientation of the Chair
  - Location of the Ball wrt. Chair
  - Location of the Ball in the Picture
- ...were analyzed and coded for the FoR they employed
- The totals were placed in a spreadsheet and tallied

FoR classification

- REL ‘relative’
- DIR ‘direct’
- INT ‘intrinsic’
- LAN ‘landmark’
- ABS ‘absolute’
- VERT ‘vertical’
- IV ‘intrinsic/vertical’
- IR ‘intrinsic/relative’
- TOP ‘topological’

B&C1 vs. ExtB&C (English)

- reduced use of the Relative and Intrinsic

Potential explanations:

- Same configurations, Different stimuli
  - New pictures taken in Buffalo with different ball, chair, and setting
  - Problems with pilot pictures: tile flooring, shadows, ball axes
- Problem with background
  - “Floor” and back “wall” difficult to distinguish
- Problem with chair
  - Front-back difficult to distinguish
- Problem with distance of ball from chair
  - May suppress use of the intrinsic
Results

B&C1 vs. the Complete Cleaned Set (English)

<table>
<thead>
<tr>
<th>Level</th>
<th>B&amp;C1</th>
<th>CCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT</td>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>DIR</td>
<td>14%</td>
<td>0%</td>
</tr>
<tr>
<td>ABS</td>
<td>7%</td>
<td>0%</td>
</tr>
<tr>
<td>LAN</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>TOP</td>
<td>8%</td>
<td>4%</td>
</tr>
<tr>
<td>VERT</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>IV</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>REL</td>
<td>43%</td>
<td>35%</td>
</tr>
</tbody>
</table>

Total: 506

Total: 511

 Canonical vs. non-canonical chairs

(English – Complete Cleaned Set)

<table>
<thead>
<tr>
<th>Level</th>
<th>Canonical Chair</th>
<th>Non-canonical Chair</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>DIR</td>
<td>15%</td>
<td>16%</td>
</tr>
<tr>
<td>ABS</td>
<td>7%</td>
<td>8%</td>
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<td>LAN</td>
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<td>7%</td>
</tr>
<tr>
<td>TOP</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>VERT</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>IV</td>
<td>12%</td>
<td>12%</td>
</tr>
<tr>
<td>REL</td>
<td>35%</td>
<td>39%</td>
</tr>
</tbody>
</table>

Total: 260

Total: 251

Possible explanation:

- Canonically-oriented Chairs easier to interpret
  - ground’s projected axes may be used to locate the figure
- Harder (for English speakers) to project chair’s axes when in non-canonical position

More Intrinsic, More Direct

More Relative, More Topological

Overview

Background

An aside: Interesting B&C results...

Study Design

Participants

Results

Work in progress

Quantitative Analysis

- Potential for quantitative analysis to determine the significance of the above results
- Multiple dependant variables, relatively small data sets, and other factors require a level of statistical modeling that is currently beyond my own skills
- May pursue these in conjunction with the Mesospace statistics team
- These issues will have to be worked out to eventually present results from data collected in other Mesospace 1b languages

Descriptive Analysis

- People are using some interesting strategies for describing the non-canonically oriented chairs
  - For example, speakers will describe a ball that is intrinsically above or below a chair as being “in front” or “behind” the chair.
- Potential analyses about these behavior are already in the works:
  1) reassignment of axes of the ground object
  2) dynamic interpretation (chair has fallen forward, and description reflects the location of ball wrt. chair before the fall occurred)
THE END!!

Acknowledgments:

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  - Derry Moore

References


