Thinking for Speaking

Evidence from the encoding of spatial dispositions in Spanish and Yucatec

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Overview

- Thinking-for-Speaking effects
  - A new domain: spatial dispositions
  - Studying dispositional contrasts in the field
  - Dispositions in Yucatec and Spanish
  - Design of our study
  - Results and analysis
  - Conclusions; what next

Thinking-for-Speaking effects

- Thinking-for-Speaking (TfS) effects
    - effects from grammar and lexicon
      - onto language use
  - Slobin’s test case: Talmy’s (1985, 2000) typology of motion event “framing”
    - “S(atellite-framed)” languages encode the path of motion outside the main verb
      - which thus becomes free to express the manner of motion
    - “V(erb-framed)” languages require the main verb to encode the path of motion
      - so manner information gets bumped to a second verb
  - some data (Slobin 2003: 165-166)
    - from a corpus of Frog Story narratives
      - collected with the picture book Frog Where Are You? (Mayer 1969)
      - from children age 3-11 and adults

<table>
<thead>
<tr>
<th>Language</th>
<th>Percentage of manner verb use (all ages combined)</th>
<th>Mean number of manner verbs per narrator (adults)</th>
</tr>
</thead>
<tbody>
<tr>
<td>V-language</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spanish</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>Turkish</td>
<td>25</td>
<td>4</td>
</tr>
<tr>
<td>Hebrew</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>S-languages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
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<td>7</td>
</tr>
<tr>
<td>Mandarin</td>
<td>62</td>
<td>11</td>
</tr>
<tr>
<td>Russian</td>
<td>69</td>
<td>16</td>
</tr>
</tbody>
</table>

Collaborators

- Valeria Belloro
  (Universidad Autónoma de Querétaro)
- Dedre Gentner
  (Northwestern University)
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    - and by the NSF Science of Learning Center on Spatial Intelligence and Learning (SILC)

Thinking-for-Speaking effects (Cont.)

- “V(erb-framed)” languages require the main verb to encode the path of motion
  - so manner information gets bumped to a second verb
  - the extra verb makes the expression of manner “heavier” and thus less “codable” in V-languages
  - and since the manner verb is syntactically optional
    - speakers of V-languages are more likely than speakers of S-languages to just omit manner, all else being equal
    - put differently, speakers of V-languages require a stronger pragmatic reason to mention manner

Thinking-for-Speaking effects (Cont.)

- some data (Slobin 2003: 165-166)
  - from a corpus of Frog Story narratives
    - collected with the picture book Frog Where Are You? (Mayer 1969)
    - from children age 3-11 and adults
  - Hsiao 1999; Özbaygilok & Slobin 1999
Thinking-for-Speaking effects (Cont.)

in what sense is this "Thinking-for-Speaking"?

• it can be interpreted as language (grammar + lexicon) affecting an internal cognitive representation
  – namely, the "preverbal message" formed by the "conceptualizer" (Levelt 1989) at the onset of speech production

– are TFS effects "Whorfian" effects, then?

• depends on the precise formulation of the Linguistic Relativity Hypothesis

• TFS effects may, but need not, be thought of as the "shallowest" kind of relativistic effects

• in any case, TFS phenomena are patterns of language use that provide a critical causal link
  – between language and possible "deep impact" Whorfian effects on farther removed cognitive systems

– follow-up question

• what properties of language cause TFS effects?

• Slobin: obligatory grammatical encoding; syntactic patterns/constraints as in the motion framing case

• but what about lexicalization?
  – this is where our study comes in!

A new domain: spatial dispositions (Cont.)

• Thinking-for-Speaking effects

  A new domain: spatial dispositions

  Studying dispositional contrasts in the field

  Dispositions in Yucatec and Spanish

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Overview

– Thinking-for-Speaking effects

A new domain: spatial dispositions

– A new domain: spatial dispositions

• from positionals = expressions of posture...

  (2.1)

  Tel

  kul·okbal

  tu=peek-il

  tu=paach

  le=nah=o’

  y=óok’ol

  okbal

  a=3=n

  DET=basket=D2

  place

  ground

  There the dog is sitting outside the house

• ... to dispositions = expressions of any spatial "disposition" – a generalization

  (2.2)

  YUC

  sup=pek·il

  supported.face.down

  -DIS(3SG)

  A3=on

  DET=house=D2

  place

  figure

  ground

  There is a mug upside down on the basket

A new domain: spatial dispositions (Cont.)

– Bohnemeyer & Brown 2007 on notional subclasses (cf. also Haviland 1994)

  • support/suspension
    – we think that posture/position is merely a special case of this
  
  • blockage of motion
    – e.g., ‘be stuck to something’, ‘be wedged between two things’
  
  • orientation in the gravitational field
    – e.g., ‘lie face up’, ‘lie face down’, ‘lie on side’, ‘be tilted at an angle’

  • configurations of parts of an object with respect to each other
    – e.g., ‘be scattered’, ‘be spread out’, ‘be in a pile’, ‘be lined up in a row’, ‘be bulging’, ‘be bent’, ‘be twisted’, ‘be coiled up’

  • what makes this a natural class?


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Studying dispositional contrasts in the field

- the challenge
  - we don’t know the dimensions of contrast among the meanings of dispositional roots
  - dispositions are largely not lexicalized in Indo-European languages
  - so for us, they do not constitute a salient natural conceptual class
  - it’s difficult to figure out the differences in meaning between a large class of lexical items
  - if you don’t know what to look for
- the solution (implemented in the field in 2006)
  - a two-phase approach, inspired by Brent Berlin’s (1968) seminal study of Tzeltal numeral classifiers

Studying dispositional contrasts in the field (cont.)

- phase I: elicitation of typical themes
  - for each of the 152 previously elicited dispositional roots, ask participants to name typical themes
  - i.e., kinds of entities of which the disposition described by a root is typically predicated
  - this was done with seven speakers, six men and one woman, in their 30s through 60s
  - the results were then consolidated again in consultation with the speakers
  - eventually, a consolidated list of typical themes was compiled for each dispositional root
  - in the process, 27 members of the original set of roots were excluded from the remainder of the study
  - because only one or two speakers accepted these roots in both of the morphological forms diagnostic of dispositional meanings, as general-currency items, i.e., not restricted to certain idioms

Studying dispositional contrasts in the field (cont.)

- phase II: contrastive demonstration of dispositions organized by themes
  - from the output of phase I, a list of the most frequently recurrent types of themes was compiled
  - 20 themes were selected for this list; by their Yucatec descriptors:
    - wa’inik ‘human’; pe’ek ‘dog’; kàan ‘snake’
    - tûunich ‘rock’
    - che ‘wood’ – instantiated by trees and by sticks; xáay che ‘crotch of a tree/branch’
    - klàabos ‘nails’ (stuck in a plank)
    - nal ‘maize’ (plant); hek ‘corn cob’; xi’n ‘corn’
    - kamyo’on ‘vehicle’
    - ha ‘water’
    - plastillina ‘playdo’ (also as a stand-in for various other similar substances – dough, clay, shit, mud…)
    - su’m ‘rope’, ‘string’
    - nóok ‘cloth’, ‘fabric’
    - lùuch ‘gourd’ (hemisphere used a container); póomo ‘jar’
    - máaskab ‘machete’
    - hu’n ‘paper’
    - ñëen ‘sand’
  - six of the seven participants of phase I were asked to demonstrate the dispositions that can be ascribed to each type of theme contrastively

Studying dispositional contrasts in the field (cont.)

- real world exemplars were used in the demonstrations
  - except for humans, dogs, snakes, trees, and trucks
    - which were (partly, in the case of humans and trees) represented by toy models
  - the demonstrations were videotaped
  - resulting in about 22 hours of recording combined
  - these recordings are still awaiting analysis ;)
  - a sample: some dispositions predicable of rope
Studying dispositional contrasts in the field (cont.)

- these are 16 of the dispositionals that elicited rope among their typical themes
  - there are at least five more in my sample

- analysis from here
  - compare the features that distinguish the use of dispositional \( d \) from other dispositionals w/ a theme
  - across the different kinds of themes \( d \) is applied to

Dispositions in Yucatec and Spanish

- unlike Yucatec, Spanish has no form class for the lexicalization of dispositions
- however, in many cases, action verb roots can be used to convey similar meanings

\[
\begin{align*}
\text{(3.1)} & \quad \text{Nok'-okbal} \quad \text{hun'-p'ee} \quad \text{p'ote} \\
& \quad \text{supported} \quad \text{face down} \quad \text{one} \quad \text{mug} \\
& \quad \text{A.3=on} \quad \text{DET=basket=D2} \\
& \quad \text{y=óok'ol} \quad \text{le=xùux=xo'} \\
& \quad \text{ground} \quad \text{place} \\
& \quad \text{YUC} \quad \text{figure} \quad \text{disposition} \\
\text{Hay una taza apoyada boca abajo en la cesta} \\
\text{SPA} \quad \text{there is a mug supported mouth down in the basket} \\
\text{figure disposition place ground} \\
\end{align*}
\]

"There is a mug upside down on the basket"

(3.2)

- but Spanish action verb roots do not lexicalize dispositions at the same level of specificity
  - example I: suspension configurations

\[
\begin{align*}
\text{(3.3)} & \quad \text{Nok'-okbal} \quad \text{hun'-p'ee} \quad \text{p'ote} \\
& \quad \text{supported} \quad \text{face down} \quad \text{one} \quad \text{mug} \\
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\]

"There is a mug upside down on the basket"

(3.4)

- as a result, Spanish speakers often need to add adjuncts and secondary predicates
  - in order to encode disposition at the same level of specificity conveyed by a single dispositional root in Maya

\[
\begin{align*}
\text{(3.5)} & \quad \text{Nok'-okbal} \quad \text{hun'-p'ee} \quad \text{p'ote} \\
& \quad \text{supported} \quad \text{face down} \quad \text{one} \quad \text{mug} \\
& \quad \text{A.3=on} \quad \text{DET=basket=D2} \\
& \quad \text{y=óok'ol} \quad \text{le=xùux=xo'} \\
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"There is a mug upside down on the basket"
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Design of our study (Cont.)

- participants
  - 20 native speakers of Yucatec
    - all bilingual in Spanish
    - tested in Yaxley, Quintana Roo, Mexico
  - 20 native speakers of Argentinean Spanish
    - none bilingual in Maya
    - tested in Buenos Aires

- procedure
  - participants viewed each picture for as long as they desired
  - and produced brief online descriptions of what they saw

Design of our study (Cont.)

- recording, coding, analysis
  - the descriptions were taped, transcribed, and coded for dispositional and locative information
  - we used frequency of locative encoding as a baseline for each population
  - we considered any expression of dispositional information that met our working definition
    - i.e., "manner in which a figure is located"
  - we distinguished between specific and generic encoding and between encoding and implicature
    - treating as generic, e.g., verb roots such as Sp. poner and Yucatec ts'a', both "put"
    - and the prepositions en in Spanish and ti' in Yucatec

Results and analysis

- Yucatec speakers encoded specific dispositional information twice as often

![Graph showing encoding frequencies: Explicit specific dispositional information](image)

\[ t(38) = 6.107, p < .000001 \]
Results and analysis (Cont.)

- overall distribution of dispositional information

![Figure 13. Encoding frequencies: All dispositional information](image)

Results and analysis (Cont.)

- Yucatec speakers also encoded specific locative information more often

![Figure 14. Encoding frequencies: Explicit specific locative information](image)

\[
t(38) = 6.107, \ p < .005
\]

Results and analysis (Cont.)

- overall distribution of locative information

![Figure 15. Encoding frequencies: All locative information](image)

Results and analysis (Cont.)

- but the average difference b/w dispositional and locative encoding frequencies – was significantly greater among the Yucatec speakers

![Figure 16. Average difference between dispositional and locative encoding frequencies](image)

\[
t(38) = 2.803, \ p < .005
\]

Results and analysis (Cont.)

- prediction confirmed – against a baseline of locative encoding frequencies
  - Yucatec speakers encode dispositional information significantly more often than Spanish speakers

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Conclusions; what next

- Thinking-for-Speaking (TfS) effects
  - causal effects from grammar and lexicon via "codability" onto the "preverbal message"
  - generated by the "conceptualizer" at the onset of speech production
- a new domain for the study of TfS: dispositions
  - stage-level spatial properties that characterize "how", rather than "where", a figure is located
- Mayan and other Mesoamerican languages lexicalize dispositions
  - at a level of semantic specificity unparalleled in Indo-European languages such as Spanish

- evidence of TfS in the dispositional domain
  - richer lexicalization renders dispositional information more codable in Yucatec
  - Yucatec speakers mention disposition twice as frequently as Spanish speakers
    - in descriptions of the same photographic stimuli
  - and also encode dispositional information significantly more often against locative information as a baseline
- follow-up questions
  - are TfS effects in the dispositional domain indeed purely lexicalization-based?
  - one possible confound: does the fact that dispositional forms are a form class in Mayan influence codability?

⇒ compare across Mayan languages!; look for set-size effects...

Conclusions; what next (Cont.)

- what makes dispositional effects a particularly interesting domain for the study of TfS
  - new domain, conceptually independent (in first approximation) of motion "framing"
  - offers the potential of observing pure lexicalization-based effects
    - unlike motion framing, which has an important syntactic component
  - populations speaking Non-Western languages are predicted to outperform
    - populations speaking Indo-European languages
    - so any observed effect couldn't easily be attributed to familiarity with test conditions, stimuli, etc.

⇒ stay tuned!

References (Cont.)


References


