

# 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
  - Slobin 1996, 2000, 2003
    - 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

(1.1) *The bottle floated into the cave*  
*figure manner path ground*

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
- (1.2) *La botella entró en la cueva flotando*  
*the bottle entered in the cave floating*  
*figure path ground manner*
- 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; Özçalışkan & Slobin 1999

Table 1. Use of manner verbs in *Frog Story* narratives (after Slobin 2003: 166)

Language	Percentage of manner verb use (all ages combined)	Mean number of manner verbs per narrator (adults)
<b>V-language</b>		
Spanish	20	3
Turkish	25	4
Hebrew	30	4
<b>S-languages</b>		
English	45	7
Mandarin	62	11
Russian	69	16

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

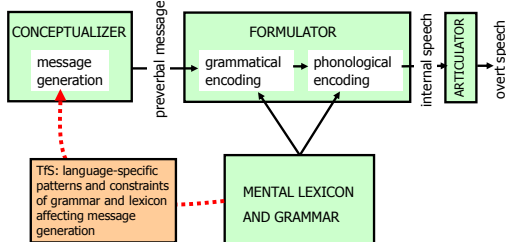


Figure 1. TFS effects in Levelt's (1989) production model

Thinking-for-Speaking effects (Cont.)

- 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!

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A new domain: spatial dispositions

- from *positionals* = expressions of posture...

(2.1) Te1 kul-ukbal u=pèek'-il tu=pàach le=nah=o'  
 YUC there sit-DIS(B3)A3=dog-REL PREP:A3-back DET=house=D2  
 disposition figure place ground  
 'There the dog is sitting outside the house'

Figure 2. *BouPod 6* (dog next to kennel)

- ... to *dispositionals* = expressions of any spatial "disposition" – a generalization

(2.2) Nok'-okbal hun-p'éel pòote  
 YUC supported.face.down-DIS(B3SG) one-CL.IN mug  
 disposition figure  
 y=óok'ol le=xúux=o'  
 A.3=on DET=basket=D2  
 place ground  
 'There is a mug upside down on the basket'

Figure 3. One of our stimulus items (mug on basket)

A new domain: spatial dispositions (Cont.)

- a working definition

**Dispositions** are non-inherent (= "stage-level") spatial properties that describe the *manner* in which a figure is located with respect to a ground

- dispositions in Mesoamerican languages
  - many MA languages have large sets of dispositional roots
    - which may produce verb stems, stative predicate forms, classifiers, and other lexical categories
      - with the appropriate derivational morphology, depending on the particular language
  - in Mayan and Mixe-Zoquean languages, dispositional roots are a separate form class
  - attested/estimated set sizes in Mayan
    - Tzotzil: 274 (Haviland 1994); Tzeltal: 267 and Yucatec: 152 (Bohnemeyer & Brown 2007)
      - Kaufman 1990 estimates upwards of 600 roots each for K'iche' and Motosintlek
      - and Mateo-Toledo 2004, based on Martin 1977, up to 700 for O'aniob'al

A new domain: spatial dispositions (Cont.)

- Bohnemeyer & Brown 2007 on notional subclasses (cf. also Haviland 1994)
  - support/suspension
    - e.g., 'sit', 'stand', 'lie', 'kneel', 'lean', 'hang', 'droop', 'dangle', 'be mounted on top of something'
    - 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?
  - Brown 1994, Haviland 1994, Levinson 1994: shape
  - Bohnemeyer & Brown 2007: *Force Dynamics* (Talmy 1988)

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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

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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 dispositionals
        - » as general-currency items, i.e., not restricted to certain idioms

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Studying dispositional contrasts in the field (cont.)

- at the same time, this and the second phase netted 24 roots not previously attested
  - » and another 11 that could not be confirmed with a sufficiently large number of speakers
  - » and so were not included in the second phase of the study
- thus a total of 152 – 27 + 24 = 149 roots complete with their lists of typical themes formed the input to phase II
- 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:
    - *wiinik* 'human'; *péek* 'dog'; *káan* 'snake'
    - *túunich* 'rock'
    - *che* 'wood' – instantiated by trees and by sticks; *xáay* *che* 'crotch of a tree/branch'

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Studying dispositional contrasts in the field (cont.)

- *kláabos* 'nails' (stuck in a plank)
- *nal* 'maize' (plant); *hek* 'corn cob'; *xim* 'corn'
- *kamyòon* 'vehicle'
- *ha* 'water'
- *plastilina* 'playdoh' (also as a stand-in for various other similar substances – dough, clay, shit, mud...)
- *su'm* 'rope', 'string'
- *nòok* 'cloth', 'fabric'
- *lùuch* 'gourd' (hemisphere used a container); *pòomo* 'jar'
- *máaskab* 'machete'
- *hu'n* 'paper'
- *áarena* '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*
    - so as to illustrate the semantic differences – if any – between the uses of different dispositionals applied to the same theme

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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



Figure 4. Through rope to hang your analists with

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Studying dispositional contrasts in the field (cont.)



Figure 5. Ropes and ropes continued

- these are 16 of the dispositional 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 dispositional w/ a theme
  - across the different kinds of themes *d* is applied to

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## 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

(3.1) **Nok'**-okbal **hun-p'éeel pòote**  
 YUC supported.face.down-DIS(B3SG) one-CL.IN mug  
**disposition** **figure**



Figure 6. One of our stimulus items (mug on basket)

**y=óok'ol** **le=xúux=o'**  
 A.3=on DET=basket=D2  
**place** **ground**

'There is a mug upside down on the basket'

(3.2) Hay **una taza apoyada boca abajo** **en la cesta**  
 SPA there is a mug supported mouth down in the basket  
**figure** **disposition** **place** **ground**

'There is a mug upside down on the basket'

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Dispositions in Yucatec and Spanish (Cont.)

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

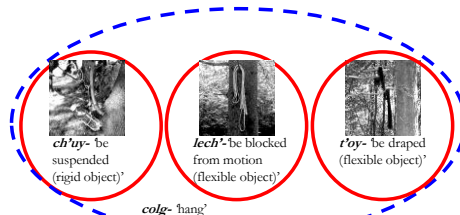


Figure 7. Specificity differences in the lexicalization of dispositions in Spanish (broken lines) and Yucatec (solid lines)

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Dispositions in Yucatec and Spanish (Cont.)

– example II: leaning support configurations

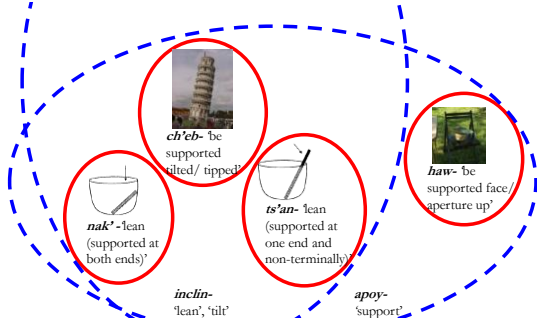


Figure 8. Specificity differences in the lexicalization of dispositions in Spanish (broken lines) and Yucatec (solid lines)

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Dispositions in Yucatec and Spanish (Cont.)

- 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

(3.3) **Nok'**-okbal **hun-p'éeel pòote**  
 YUC supported.face.down-DIS(B3SG) one-CL.IN mug  
**disposition** **figure**



Figure 9. One of our stimulus items (mug on basket)

**y=óok'ol** **le=xúux=o'**  
 A.3=on DET=basket=D2  
**place** **ground**

'There is a mug upside down on the basket'

(3.4) Hay **una taza apoyada boca abajo** **en la cesta**  
 SPA there is a mug supported mouth down in the basket  
**figure** **disposition** **place** **ground**

'There is a mug upside down on the basket'

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## Design of our study

- our hypothesis: TfS
  - richer lexicalization makes disposition more codable in Yucatec
  - hence, Spanish speakers are less likely than Yucatec speakers to encode disposition
    - under the same pragmatic conditions

- stimuli
  - 18 photographs of objects in various spatial configurations

Figure 10. Six of our stimulus items

- plus 6 landscape shots as fillers



Figure 11. Three of our fillers

- presented in randomized order

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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

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### Design of our study (Cont.)

- all participants were tested in their native language
- 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

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## Results and analysis

- Yucatec speakers encoded specific dispositional information twice as often

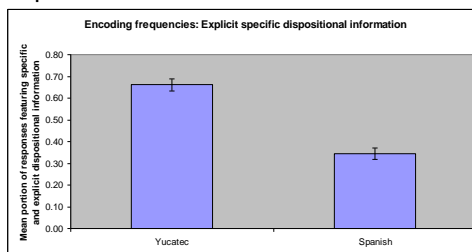


Figure 12. Encoding frequencies: Explicit specific dispositional information

$t(38) = 6.107, p < .000001$

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Results and analysis (Cont.)

- overall distribution of dispositional information

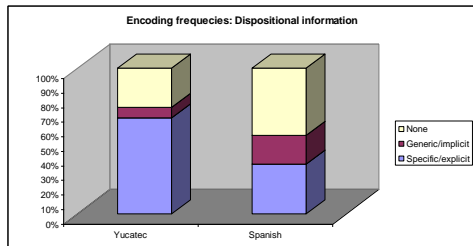


Figure 13. Encoding frequencies: All dispositional information

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Results and analysis (Cont.)

- Yucatec speakers also encoded specific locative information more often

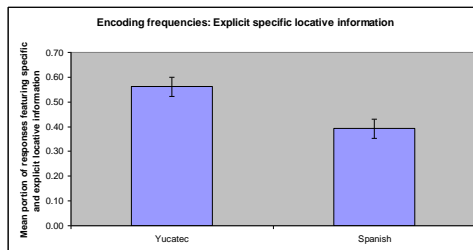


Figure 14. Encoding frequencies: Explicit specific locative information

$t(38) = 6.107, p < .005$

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Results and analysis (Cont.)

- overall distribution of locative information

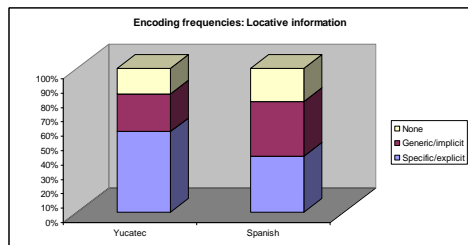


Figure 15. Encoding frequencies: All locative information

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Results and analysis (Cont.)

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

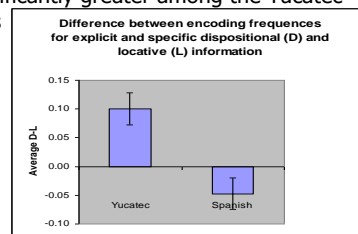


Figure 16. Average difference between dispositional and locative encoding frequencies

$t(38) = 2.803, p < .005$

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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

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Conclusions; what next (Cont.)

- 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 dispositionals are a form class in Mayan influence codability?
      - ⇒compare across Mayan languages!; look for set-size effects...

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Conclusions; what next (Cont.)

- what makes dispositions 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.

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Conclusions; what next (Cont.)

⇒...and for effects of lexicalization of individual (subdomains of) dispositions in one Mayan language as opposed to another!

- another possible confound: the role of dispositionals in locative predications
  - in some Mayan languages, dispositional forms are used as lexical heads of prototypical locative predicates
    - » e.g., this is the case in Tzeltal, but not in Yucatec (Bohnermeyer & Brown 2007)
  - ⇒compare across Mayan languages!
- are there “deep impact” relativistic effects from dispositional lexicalization?
  - a pilot study suggests Yucatec speakers may outperform Spanish speakers in recall memory for dispositions
    - however, the results were only marginally significant and we are currently working on improving the design

⇒ stay tuned!

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