

# The 6<sup>th</sup> China International Forum on Cognitive Linguistics

*Language, Culture and Mind:*

10 lectures on development, evolution and cognitive linguistics

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## Lecture 5

Patterns of mapping: distributed spatial  
semantics, cognitive typology and language  
development



# What is cognitive about cognitive typology?

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- There is evident continuity with the research programme initiated by Greenberg of identifying universals, but
- CT is based upon a cognitive-functional approach which analyzes mappings from conceptualization to expression
- CT is concerned not just with universal cognitive motivations of structure, but also with linguistic and cognitive variation



# Complementary goals of Cognitive Typology

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- To identify invariants or constraints
  - In language structure
  - In language history
  - In language acquisition
- To explore dimensions of variation
  - The relations between these dimensions
  - Their relations to cultural variation
  - Their cognitive correlates in speakers



# Cognitive typology, culture and thought

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- Aim 1: to establish relations of relations of correlation and complementarity between dimensions of language variation (language as equilibrated systems)
- Aim 2: To correlate these to dimensions of variation in the material and symbolic cultures of language communities (Lecture 6)



# Semiotic mediation

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- Aim 3: To explore the cognitive correlates in individual speakers/learners of linguistic and cultural variation
- Aim 4: To use this evidence to determine the main characteristics of plasticity in the human cognitive system
- Aim 5: Preferably employing converging evidence from different sources



# Language variation as preferential construal

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- Languages vary in their preferred patterns of construal
- Languages can be viewed as emergent, culturally situated cognitive systems subserving symbolic communication
- The search for invariants is essentially the search for *constraints* on variation



# Space, language and cognition

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- Spatial conceptualization in language exhibits striking cross-linguistic variation.
- Variation in conceptualization is accompanied by variation in expressional means
- And in the mapping patterns from conceptualization to expression



# Dimensions of variation in spatial language

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- Conceptualization patterns: Frame of Reference; Animate (Body) vs. Inanimate schematic grounding; Path Specification; Visibility-Nonvisibility of Trajector; Speaker Viewpoint.
- Expression systems: Verbs of motion and disposition; locative nouns (including body-part nouns); V- and N-derived adpositions; adverbials; case inflections; verbal prefixes and suffixes.





# Mapping variation as lexical selection

tr / Im	Cup/ Table	Picture/ Wall	Dog/ Leash	Man/ Field
Danish	på	på	i	på
Dutch	op	aan	aan	in
English	on	on	on	in
Spanish	en	en	en	en

# Mapping variation and schematic grounding

English

IN

UNDER

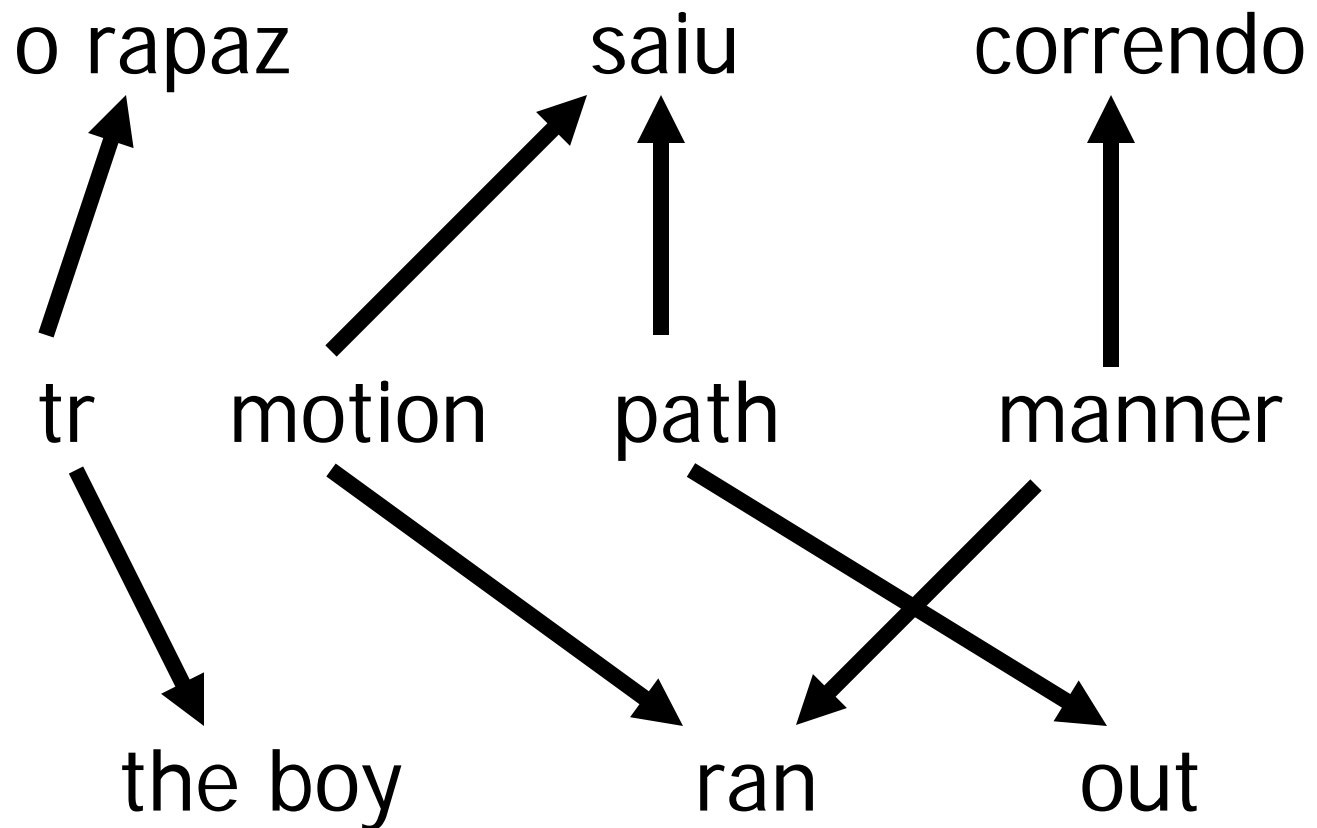


Zapototec

STOMACH

STOMACH

# Mapping variation as construction parameter: Verb *vs* Satellite framing (Talmy)





# A general theoretical framework

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- **Distributed Spatial Semantics** (Sinha & Kuteva 1995)
- The conspiracy theory of meaning (Ameka, 1995)
- Holistic Semantics (Zlatev, 1997)
- Many-to-many mapping from linguistic conceptualization to linguistic expression.



# Meaning, mapping and conceptualization

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- CONFLATION (Talmy)  
N C-aspects -> One E-item ( $N > 1$ )
- COMPOSITIONALITY  
One C-aspect -> One E-item
- DISTRIBUTION  
One C-aspect -> N E-items ( $N > 1$ )



# Verb and Preposition in Dutch and English

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- The vase is ON the table
- The picture is ON the wall
- De vaas STAAT OP de tafel
- De schilderij HANGT AAN de muur
- Hij plakt de affiche OP de muur  
He pastes the poster ON the wall
- De affiche zit vast AAN de muur  
The poster is STUCK TO/ON the wall



# Ewe distribution pattern (Ameka, 1995)

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Agálã

**do le**

do **me**

crab - exit-be.at- hole-inside

"The crab exited from the inside of the hole"

*The crab has got out of the hole*

Path, Motion->V, Path->PostP,

Loc. Relation->Prep.



# Bulgarian distribution patterns

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Tja     **dopàlzja**     **do**     vratata.

she-ADJACENT+CONTACT.crept-ADJACENT+CONTACT-  
door.the

*She crept up to the door*

Samoletàt     **preletja**     **nad**     grada.

plane.the-through.flew-above/over-town.the

*The plane flew over the town.*

Manner, Motion->V, Path->V.Prefix,

Path->Prep.





# Japanese mapping pattern

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Sensei wa hon o hako (no **naka**)†**ni**# **ireru**

Professor-TOPIC-book-OBJ-box-(GEN-inside)-  
LOC-insert.PRES

”The professor inserts the book in the inside of the box”

*The professor puts the book in the box.*

†=optional, #=optional in colloquial speech

Path, Motion, Cause->V, Path->LocN,  
Loc. Relation->PostP



# Language development as symbolic learning

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- To learn a language is to learn to communicate symbolically
- Symbolic communication involves conventional mappings from conceptualization to expression
- Natural languages are multi-level symbolic systems permitting flexible construal



# Language and cognition in language acquisition

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- When children start to acquire language, they already have a developmental history including the development of pre-conceptual and sensori-motor schemas
- What is the relationship between pre-linguistic cognitive development and early language acquisition?



# Cognition and spatial language acquisition 1

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- The cognition hypothesis predicts that children map spatial relational expressions to universal pre-existing spatial concepts. Since languages vary in their semantics, this should give rise to many and predictable errors (Cromer)



# Cognition and spatial language acquisition 2

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- The language-specific acquisition hypothesis predicts that children should pay attention to linguistic usage, changing their pre-linguistic cognition to conform with the mapping patterns in the target language and making relatively few errors (Bowerman et al.)



# Learning to talk about space

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- Movement and dynamic spatial relations are amongst the earliest topics of child language.
- Expressions equivalent to in(to), out, on(to), off, up, down appear in the first 50-100 words in many different languages, though the construction types may vary widely. Terms like "in front of" often appear much later.
- This seems to support the cognition hypothesis



# The semantic infant

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- Bowerman and Choi compared acquisition patterns (production and comprehension) in English, Dutch and Korean (a verb-framed language with a language-specific verb, *kkita*, meaning to put two objects into a tight fitting relationship).
- They found that children's acquisition patterns followed the semantics of the languages being acquired, supporting the language specific acquisition hypothesis.



nohta  
put on



kkita  
put on

Example of the type  
discussed by Bowerman and  
collaborators (Choi, DeLeon)



kkita  
put in





# Productive acquisition in 3 languages

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- English and Danish are closely related satellite framed Germanic languages
- Both languages are prepositional, but Danish locative particle morphology is more complex
- Japanese is a verb framed language, also employing optional locative nouns and a small (n=6) class of postpositions

Sinha, C., Thorseng, L.A., Hayashi, M. and Plunkett, K. (1999). Spatial language acquisition in Danish, English and Japanese. In P. Broeder and J. Murre (eds.) *Language and Thought in Development*. Tübingen, Gunter Narr Verlag.



# English vs Danish

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- *Lexically*, English is somewhat more polysemous and the overall lexical diversity of the Danish locative particle system is greater than that of English
- *Morphologically*, Danish has a more complex combinatorial structure than English, with basic and derived particles
- *Distributionally*, Danish permits a higher degree of semantic profiling of the spatial relations which are conceptualized.



# English and Danish vs Japanese

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- English and Danish satellite framed
- Japanese verb framed
- Japanese has only 6 locative postpositions
- And a small number of locative-partonymic nouns (non-BP)
- 3 relevant form classes as opposed to 1



# English acquisition (n=2)

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- 8 morphologically and cognitively simple locative particles are most frequent in child speech and child directed speech
- *In, on, up, down, to, at, out, over*
- Same 8 particles are those earliest acquired
- Acquisition is *late* and *slow*, vocabulary only expands to 6-8 types between 24 and 27 mo.
- Children start from a subset of the cognitively and semantically simplest particles, gradually extending their repertoire to include cognitively and semantically more complex ones.
- Children start with a core impetus meaning ("one item-one meaning") then follow the radial structure of the different meanings or use types (conservative learning)
- There are almost no errors, since the basic pattern yielded by conservative learning is one of underextension not overextension.



# Danish acquisition (n=2)

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- First acquired particles are the most frequently occurring, cognitively and morphologically simple ones
- 7 of the first 8 acquired particles are the same for each of the two children. 6 of these are cognates with the 8 particles first acquired by the English children, but within the group of 6-8 first acquired particles the acquisition orders in Danish and English are different .
- Vocabulary expansion begins at 18-24 months and at this point derived particles also begin to be produced. Simple particles are most frequent throughout period of study. There is no clear order of acquisition within the different derivational subdivisions of the derived particles.
- Danish children also employ a conservative learning strategy but their acquisition appears to be earlier and faster than that of the English children and (consistently with Danish morphology) they produce derived particles earlier and more frequently than English children.



# Japanese acquisition (n=1)

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- Locative verbs are acquired before either locative postpositions or locative nouns.
- Vocabulary expansion begins at about 22 months, at the same time Adam starts to use nouns and particles as well as verbs.
- Particle use remains extremely underextended and context bound. There are virtually no errors in the use of items from any of the three form classes.
- Frequency of particular form classes in input cannot alone account for order of acquisition.
- Meanings expressed by first-acquired verbs are cognate with dynamic meanings expressed by first acquired prepositions in Danish and English.



# Discussion 1

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- A **two-phase model** of acquisition
- During **the first phase**, the child learns to express spatial relational meaning by selections from the form class which is **dominant** in the expression of spatial relational meaning for the target language
- First acquired spatial meanings include:
  - Containment, support, vertical motion, goal directed motion, co-location



## Discussion 2

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- During the second phase, the child's repertoire expands beyond 7-8 items and into non-dominant form classes
- And more complex profiling of spatial and motion relations

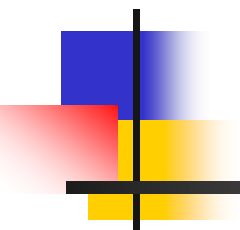




# Conclusion

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- The **cognition hypothesis** (and verb island hypothesis: Tomasello) seems best to account for **Phase 1** semantic content
- the **language specific acquisition hypothesis** seems best to account for **Phase 2** semantic and morphological development
- **Conservative learning** is characteristic of the acquisition process for spatial relational meaning and its linguistic expression across languages



Thank you