

Spatial Descriptions

Idea for a Dissertation

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Field

Lexical semantics

Topic

Lexical entries for words involved in spatial descriptions.

Supervisor

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Start

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Overview over the Talk

Motivation

Aims

Hypothesis

Approach

Real Metaphysics

realm of physics, chemistry, ...

objective notion of real world entities

Natural Language Metaphysics

realm of our speaking

subjective / cognition based notions of real world entities

Question

Which aspects of meaning can be defined by conditions relating to real metaphysics?

intention???, purpose???, belief???, ..., time?, space?, ...

Semantical Lexical Entries for ...

dimensional adjectives *lang, hoch, breit, tief, ...*

spatial prepositions *in, auf, vor, über, ...*

positions verbs *liegen, stehen*

Lexical Entry: sich befinden

	befinden	DP:nom; subj	refl.acc	PP(prep_{loc} +DP:dat)
	s	x	\emptyset	z
Selection Restriction	state	material object(x)		material object(z) \vee region(z)
Semantic Representation	<div style="border: 1px solid black; padding: 5px; display: inline-block;">s:OCC(x,r_z)</div>			

- OCC is a primitive element, expressing an object occupying the given spatial region.
- r_z is a spatial region depending on the preposition and the object z.

Dimensional Adjectives

Can the use of dimensional adjectives be predicted by

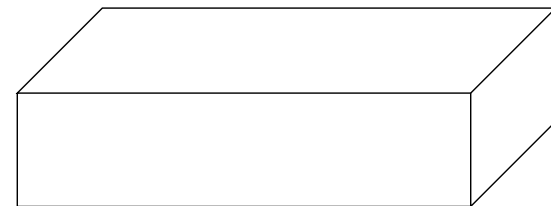
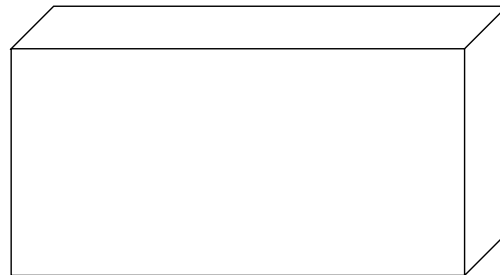
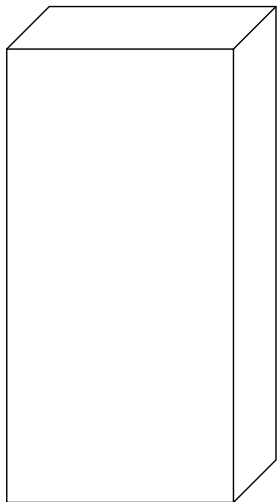
- function of the object (e.g. cupboard),
- shape of the object (e.g. pole),
- orientation relative to the horizontal plane and to the observer?

- (1) Der Schrank ist 200 cm **HOCH** (*high*), 100 cm **BREIT** (*wide*) und 50 cm **TIEF** (*deep*).
- (2) a. Die Pfahl ist 2 m **LANG** (*long*), und 20 cm **DICK** (*thick*).
b. Die Pfahl ist 2 m **HOCH** (*high*), und 20 cm **DICK** (*thick*).
c. Die Pfahl ist 2 m **HOCH** (*high*), 20 cm **BREIT** (*wide*) und 20 cm **TIEF** (*deep*). \Rightarrow square cross-section

Position verbs

How do **shape**, **orientation** and **function** of an object determine the user of *liegen (lie)* or *stehen (stehen)*?

Are there other factors?

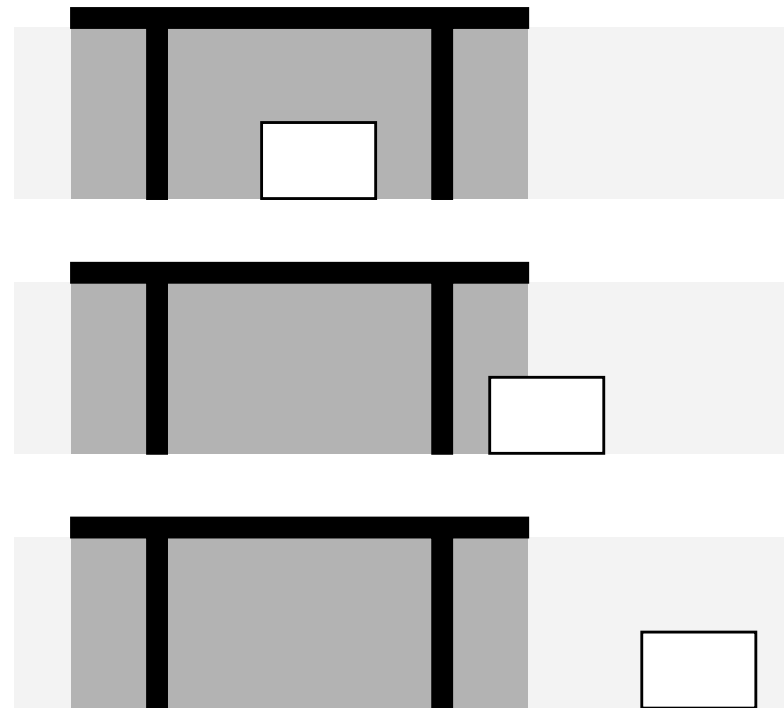


Spatial Prepositions

- What determines the meaning of “X ist *prepl_{loc}* Y.”?

(3) X ist unter dem Tisch.
X is under the table.

- inclusion in the vertical extension of B
- intersection with the vertical extension of B
- deeper on the vertical axis than B



Hypothesis

Spatial descriptions in German base on a conceptualisation of space which does not need more than 3 orthogonal directions.

(lecture manuscript by Kamp and Rossdeutscher)

- vertical direction
 - observer direction
 - transversal direction
- ⇒ no Euclidean geometry
- ⇒ no diagonal planes or lines

Desideratum

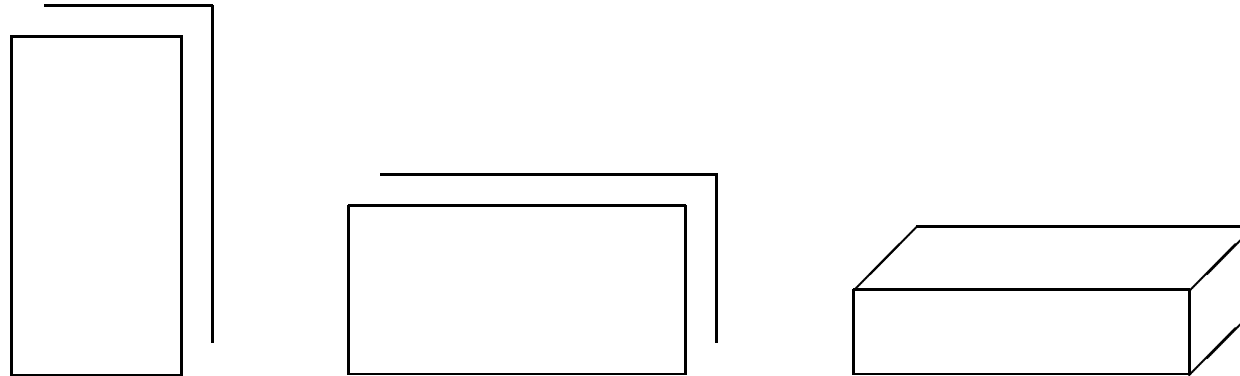
Method to evaluate the conceptualisation of space.

Approach

- Data collection (corpora, domain specific texts, GIS - geo information systems)
- collecting ontologies of space (CyC, wordnet, ...)
- identification of phenomena
- development of an evaluation method / devising experiments
- iterative advancement of the orthogonal conceptualisation of space

Summary

- DRT lexicon entries for German words expressing spatial properties
- orthogonal conceptualisation of space
- evaluation method



- (4) Der Quader ist 200 cm **LANG** (*long*), 100 cm **BREIT** (*wide*) und 50 cm **DICK** (*thick*).
- (5) a. Der Quader ist 200 cm **HOCH**, 100 cm **BREIT** und 50 cm **TIEF**.
b. Der Quader ist 200 cm **LANG**, 100 cm **HOCH** und 50 cm **DICK**.
c. Der Quader ist 200 cm **BREIT**, 100 cm **TIEF** und 50 cm **HOCH**.

out: e.g. **LANG** (*long*)/**DICK** (*thick*)/**TIEF** (*deep*)