THE SEMANTICS OF PREPOSITIONS: SOME PRELIMINARIES

(1) Vector Space Semantics
A semantic theory of (spatial) prepositions based on the mathematics of vector spaces (analogous in methods and goals to the theory of Generalized Quantifiers for determiners).

(2) Preliminaries
i. What does the empirical domain of prepositions look like?
ii. What are some of the questions about prepositions that need to be answered?

1 Some distinctions and notions

(3) above, across, around, at, behind, below, beside, between, from, in(side), into, near, on, onto, outside, over, through, to, via

(4) a. spatial - nonspatial
b. transitive - intransitive
c. simple - complex
d. locative - directional
e. projective - topological

(5) Spatial: see (3); Nonspatial: against, concerning, despite, like, since

(6) Transitive: see (3); Intransitive: away, back, here, left, north, upstairs

(7) a. He is beside *(the house), He came from *(the house)
b. He is here (*the house), He went away (*the house)
c. He is inside (the house), He walked around (the house)

(8) Simple: see (3); Complex: far from, in front of, to the left of, out of

(9) Locative: above, at, below, between, in(side), near, outside
Directional: across, from, into, onto, over, through, to, via

(10) a. The car is outside/behind/?to/?from the house
    b. We found ourselves in/?into/?through a cave

(11) Projective: above, under, behind, beside, left of, to the north of
Non-projective ('topological'): in(side), outside, on, at, near, between

(12) The preposition as a relation
    The cat is in the box
figure  ground  (Talmy 1983)
located object/theme reference object  (Jackendoff 1983)
trajectory  landmark  (Langacker 1987)
external arg.  internal argument  (Williams 1981)

(13)  *The PP as a region*

The cat is in the box
‘The cat is located in a region/search domain/place defined w.r.t. the box’

(14)  *The PP as a predicate*

   a.  The house is near the river (primary predicate)
   b.  Bob bought a little house near the river (noun modifier)
   c.  It was raining near the river (verb modifier)

(15)  *Location of objects and events*

   a.  near-the-river(the-house)
   b.  Bob bought x and x is a little house and near-the-river(x)
   c.  There is an event e, e is raining, and near-the-river(e)

(16)  *Modifiers*

The treasure is two feet/right/deep under the tree

(17)  *The structure of the PP*

[PP [P' Modifiers [P' P Complement ]]]

2  *Some things that need to be addressed*

2.1  *Entailments (and lexical relations)*

(18)  *Transitivity*  (19)  *No transitivity*

A is inside B  A is diagonally above B
B is inside C  B is diagonally above C
A is inside C  *A is diagonally above C

(20)  *Symmetry*  (21)  *Converseness*

A is near B  A is above B
B is near A  B is below A

(22)  A will go into/through B  (23)  A will go over B
A will be in B  A will be above B
Directional opposition and ‘symmetry’
The train moved back towards the station/back through the forest
The train had moved away from the station/through the forest

Upward monotonicity I
The house is in Paris
The house is in France

Downward monotonicity I
The house is outside France
The house is outside Paris

Assume: The bomb is between the flag and the house

\[ \text{Upward monotonicity II} \quad \text{Downward monotonicity II} \]

The bomb is behind the house
The flag is near the house

2.2 Truth-conditions
(28) a. The bird is over/above the house
b. The fly is near/on the wall
c. The car is in front of the house/tree
d. The car goes around/past/along the village

(29) What are the geometric and functional conditions that make such sentences true?
a. Where are the boundaries of a region?
b. What role do inherent axes and perspective play?
c. How should we distinguish paths of directional prepositions?

2.3 Modifiers
(30) What is the compositional semantics of a modified PP?
(31) Why are certain modifications excluded?
  a. two meters behind/in front of/above/over/below/under/beside/outside NP
  b. * two meters near/on/at/inside/in/between NP

How can we characterize the difference between the two classes of prepositions?

2.4 Meaning constraints (Universals)
(32) Are there any constraints on the meaning of prepositions and prepositional phrases? Can we derive the non-existence of certain imaginary prepositions?
(33) a. *aboven the hut = ‘an even number of meters above the hut’
b. *far the mountain = ‘far from the mountain’
c. *inose the bus station = ‘inside something close to the bus station’

2.5 Some other issues (not addressed in this course)
How do we deal with the rich patterns of polysemy? (Lakoff 1987)

What role does schematization, idealization, abstraction play? (Herskovits 1998)

How does the spatial meaning interact with functional and pragmatic notions? (Aurnague & Vieu 1993)

How does the interpretation of prepositions interact with cognitive factors? (Regier & Carlson-Radvansky 1998)

How do prepositions grammaticalize from non-prepositions? (Heine & Reh 1984)

How do prepositions metaphorically extend to non-spatial domains? (Radden 1989)