Maximal interpretation of temporal and spatial adverbs

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Chronos 9
Context

- Temporal measure expressions
  1. in, within
  2. for, across, through, throughout
Data

- for, across, through, throughout
- English, Hungarian
Hypothesis

- Maximality effects with some adpositions

- Strong correlation between spatial interpretation and (temporal and spatial) measure expressions
Roadmap

1. Measure expressions
2. Spatial configurations
3. What the data show
4. Discussion
5. Further points
1 Measure expressions

2 Spatial configurations

3 What the data show

4 Discussion

5 Further points
Durative temporal modifiers

1. The baby slept through the night.
2. The baby slept throughout the night.
3. Sinath slept for eight hours.
4. Sinath slept through eight hours (of the ten-hour meeting).
5. Sinath slept throughout eight hours.

English *across* is very awkward in temporal modification. Other languages have similar expressions that can be used in temporal modification (*i.e.*, Hungarian *át*, discussed below)
Durative temporal modifiers

1. The baby slept through the night. (without waking up)
2. The baby slept through the night. (but woke up fourteen times)
3. The baby slept throughout the night. (and didn’t wake up once)
4. The baby slept throughout the night. (but she woke up fourteen times)
Durative temporal modifiers

1. Sinath slept for eight hours. (and didn’t wake up once / but awoke frequently)

2. Sinath slept through eight hours of the ten-hour meeting. (but woke up a number of times)

3. Sinath slept throughout eight hours. (but she woke up several times)
Durative temporal modifiers

- Some adpositions appear to disallow or at least appear not to prefer gaps
- *Through* is such an adposition
Durative temporal modifiers

1. János két órán keresztül olvasott
   ‘Janos read for two hours.’ (no breaks)

2. János két órán át olvasott
   ‘Janos read for two hours.’ (it is possible that he took breaks)
Durative temporal modifiers

1. János két órát olvasott
   J-nom two hour-acc read
   ‘Janos read for two hours’

2. János két óráig olvasott
   J-nom two hour-until read
   ‘Janos read for two hours’
English spatial measure

1. for two miles
2. throughout two miles
3. through two miles (of mud)
Hungarian spatial measure

1. két méteren át
   two meter-on across
   ‘for two meters’

2. két méteren keresztül
   two meter-on through
   ‘for two meters’
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Spatial configurations

1. Measure expressions

2. Spatial configurations

3. What the data show

4. Discussion

5. Further points
1. Bess walked across the house.
2. Bess walked through the house.
Forest / lake

1. The parrot flew across the forest.
2. The parrot flew through the forest.
3. The diver swam across the lake.
4. The diver swam through the lake.
Crosswalk

1. The bicyclist rode across the crosswalk.
2. The bicyclist rode through the crosswalk.
Curtain

1. Michael walked through the curtain.
2. Michael walked across the curtain.
3. ?Michael (who is a ghost) walked throughout the curtain.
Different kinds of dimensional MAX

- House/forest/lake all have more than one possible (intrinsic) dimensional specification, and the ambiguity with across allows either of the specifications.

- Crosswalk/curtain have a unique dimensional specification; ambiguity relates to whether or not the dimension of the path of the movement described is included. (Ground/Figure)
Pipe

- a csövön át / keresztül folyt a víz
  the pipe-on across / through flowed the water.nom
  ‘The water flowed throughout the pipe’

- át: some part of the pipe is filled
- keresztül: entire volume of the pipe is filled
Bird

- a madár az erdőn át / keresztül repült
  the bird.nom the forest.on across / through flew
  ‘the bird flew across the forest’

- át: above or among the trees
- keresztül: among the trees
Crosswalk

- az autó a zebrán át / keresztül ment
  the car.nom the crosswalk.on across / through went
  ‘the car went through the crosswalk’

  - át: ambiguous
  - keresztül: perpendicular to crosswalk
1. Measure expressions

2. Spatial configurations

3. What the data show

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5. Further points
Maximal readings

- Some adpositions contain MAX
  - They require maximal readings
  - through, keresztül

- Other adpositions do not contain MAX
  - They do not require maximal readings
  - across, át
Maximal reading

- **D** (dimensional)
  The highest number of possible dimensions is relevant (the number of dimensions can be determined by (a) the intrinsic dimensions of the ground or (b) by the path of the figure in addition to the dimensions of the ground)

- **E** (extent)
  The extent of the object is maximally affected (no gaps)
Discrete P heads in both Hungarian and English show remarkable consistency in whether or not they require maximality.

MAX operator contained in the lexical specification for P heads *through, keresztül*
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Discussion

1 Measure expressions

2 Spatial configurations

3 What the data show

4 Discussion

5 Further points
Maximality

- Single maximality operator

- Two interpretations
  - D-max (maximal number of dimensions)
    - Intrinsically ambiguous D-specification of the ground
    - Introduced by a path (movement of figure)
  - E-max (maximal extent)
    Maximal affectedness of objects with non-ambiguous dimensional configuration

- D-max first
Intrinsic D-specifications of objects

- (2- or 3-D)
  - The lake is large. (2-D)
  - The lake is deep. (3-D)

- (1- or 2-D)
  - The pipe is long. (1-D)
  - The pipe is thick. (2-D)
2- or 3-D

- The diver swam across the lake. (no maximality)
- The diver swam through the lake. (maximality)
The diver swam across / through the lake

- Scenario 1: The diver swims from one side of the lake to the other while submerged under the water. (lake is 3-D) (across / through)
- Scenario 2: The diver swims from one side of the lake to the other without becoming submerged in the water. (lake is 2-D) (across / through)
Maximality

- Single maximality operator

- Two interpretations
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    - Intrinsically ambiguous D-specification of the ground
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    Maximal affectedness of objects with non-ambiguous dimensional configuration

- D-max first
D-MAX II: Introduced by axis of movement of figure

- (2- or 3-D)
  - Paola walked across the curtain. (2-D...not maximal)
  - Paola walked through the curtain. (3-D...maximal)
- (1- or 2-D)
  - The bicyclist rode across the crosswalk. (1-D ...not maximal)
  - The bicyclist rode through the crosswalk. (2-D...maximal)
The axis of movement is outside of the plane / dimension(s) of the ground
Additional axis

- The aneurysm grew as it approached the valve and gradually covered it
  - Path is outside the plane of the covered object (roughly perpendicular to it)
  - (This makes the extent reading possible)
  - Gawron 2009
Maximality

- Single maximality operator

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    Maximal affectedness of objects with non-ambiguous dimensional configuration

- D-max first
E-MAX

- Only one dimensional specification; no additional path dimension possible
  - The desert is large. (2-D)
  - The desert is deep/high/tall. (3-D)
  - The desert is long.

- Paths
  - Marko drove across the desert.
  - Marko drove through the desert.
  - Marko drove throughout the desert.
Measure phrases have only one dimension (one vector), so additional dimensions are impossible.

1. The baby slept throughout the night. (no maximality)
2. The baby slept through the night. (maximality)
Maximality

- Single maximality operator

- Two interpretations
  - D-max (maximal number of dimensions)
    - Intrinsically ambiguous D-specification of the ground
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    Maximal affectedness of objects with non-ambiguous dimensional configuration

- D-max first
Favorite Flavor of the Maximality Operator

- Extent maximality (E-MAX) seems to show up only when dimensional maximality (D-MAX) is impossible for some reason
  - There cannot be more than one dimension specification in the object
  - It is impossible to introduce an additional dimension that is the axis of the movement of the Figure
- It seems that MAX prefers dimensional maximality (D-MAX)
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Consistency of *through*

1. The bird flew through the forest.
2. The bicyclist rode through the crosswalk.
3. The baby slept through the night.
4. He drove through the desert.
Other temporal modifiers

1. Martha saw it in an hour.
2. Martha saw it within an hour.
3. Martha died in an hour.
4. Martha died within an hour.
Gawron 2009

- Transparency between temporal and spatial domains (e.g. change either in a spatial or temporal dimension (Gawron 2009)

- Gawron 2009
  - Extent and event readings
  - Axis of change (also measuring change along an axis)
  - Independence of axes
    Axis of change must be independent from the measurement axis
Gawron 2009

- Axial predicates
- The trail snaked up the hill
- Temporal equivalents?
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Further points

Extension

- Crosslinguistic data (English, Hungarian, Spanish)
- Test consistency of judgments across speakers
- Priming effects between spatial and measure expression

Similar
  - Boroditsky 2000
  - Matlock et al. 2005
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