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A COGNITIVIST ATTENTION-BASED SEMANTICS OF DIRECTIONALS
LOCATIONALS VS. DIRECTIONALS

- Locationals:
  - e.g., *in the house*
  - somehow static
  - description of the place of some object

- Directionals
  - e.g., *into/out of/through the house, from the roof,…*
  - somehow dynamic
  - description of the path of some object
  - typically associated with locomotion (verbs)
All along the watch tower
princes kept the view
ANSWERING THREE QUESTIONS

▸ What’s “attention” and “attention-based”?

▸ What’s “Cognitivist”?

▸ What does that have to do with “Semantics( of directionals)”?

▸ taking three perspectives
  ▸ the linguistic
  ▸ the philosophical
  ▸ the (neuro-)psychological
MOTIVATION: SELECTIVE ATTENTION: POP-OUT-PHENOMENON

INSIGHT:

▸ not everything we see/perceive is (fully) processed

▸ not everything we see/perceive is available for conception and language

▸ selective attention determines what and how we conceptualize and linguistically categorize the world
LANGUAGE AND PERCEPTION (AND THE WORLD)

MIND/brain

LANGUAGE

CONCEPTS

PERCEPTION

WORLD
THE SEMANTIC PROBLEM: HOW LANGUAGE RELATES TO . . .

Logical semantics
THE SEMANTIC PROBLEM: HOW LANGUAGE RELATES TO ...

Categorical, propositional representations (Features, predicates, arguments (Logic), ...)

Classical, non-logical semantics (e.g., Miller/Johnson-Laird 1976)
THE SEMANTIC PROBLEM: HOW LANGUAGE RELATES TO . . .

Cognitive semantics (e.g., Lakoff 1987)
THE PHILOSOPHICAL PROBLEM: WHAT EXISTS IN THE WORLD?

MIND

WORLD

Particulars
(EIGER, BERN, BARACK OBAMA, ...)

Universals
((BEING_A_)PERSON, RED, BEAUTY...)

Realism (e.g., Barry Smith)
THE PHILOSOPHICAL PROBLEM: WHAT EXISTS IN THE WORLD?

Conceptualism (e.g., Ockham)

MIND

Universals

((BEING_A_)PERSON,
RED, BEAUTY...)

WORLD

Particulars

(EIGER, BERN,
BARACK_OBAMA, ...)
THE PHILOSOPHICAL PROBLEM: WHAT EXISTS IN THE WORLD?

MIND

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WORLD

Cognitivism (e.g., Carstensen)
THE PROBLEM OF COGNITIVISM

- where do the structural distinctions of mental representations come from?
- (leaving aside ridiculous nativist assumptions)
for more on visual illusions visit Michael Bach’s page at http://www.michaelbach.de/ot/
LESSON LEARNED

▸ our perception is evolutionarily adapted to the world „out there“

▸ some aspects of the world are represented and processed pre-attentively

▸ strange input or missing context leads to von-veridical interpretation
http://www.michaelbach.de/ot/mot-sam/index.html
the time to identify a complex item (conjunctive search) increases with the number of items
SELECTIVE ATTENTION I

- is necessary for conscious/higher representation
  - selects information for further processing, representation, learning, consciousness, language
- makes selected implicit information **explicit**
- imposes further structure on pre-attentively processed input
- categorical distinction:
  - focused attention
  - distributed attention
EXPERIMENTAL EVIDENCE (BELLUGI ET AL. 2001)

Stimulus

typical reproduction of Downs-syndrome person

typical reproduction of Williams-syndrome person
SELECTIVE ATTENTION II

- seems to operate on two levels simultaneously
  - global level
  - local level
SELECTIVE ATTENTION III

- attentional engagement is temporally restricted (in a temporal „window“ or „frame“)
  - followed by „disengagement“
    - disorder: simultanagnosia
  - with a „don’t go directly back to where you just were“-mechanism („inhibition of return“)
- acts on different levels of representation („reference frames“)
SELECTIVE ATTENTION

- leads to the construction / re-cognition of
  - representations of the attended information
  - so-called „object-files“ (~particulars)
    - which are conceptually categorized by „concepts“ (~ universals)
DYNAMIC SELECTIVE ATTENTION

- sequential attention („scanning“)
  - nb: not necessarily the same as eye fixations (scan paths)
- tracing an entity along some dimension
- tracking moving entities
THE COGNITIVIST PICTURE (SIMPLIFIED)
COGNITIVIST ONTOLOGY

- i.e., the coarse structure of „what there is“ in the world from human perspective
- is based on aspects introduced
  - (focused/distributed, global/local, frames)
    - ±focused global, ±focused local
- Distinctions:
  - entities defined wrt. a single frame (~“Object”)
  - entities defined wrt. multiple frames (~“Event”)

„OBJECTS“, UPPER LEVEL

Single-Frame-Determined (SFD)

Non-Focused-Attended (−fg)
- Mass/Substance (−fl)
- Aggregate/Collection (+fl)

Focused-Attended (+fg)
- Group (+fl)
- Object (−fl)
- Boundary
- Simple-Object
"EVENTS", UPPER LEVEL

Multi-Frame-Determined (MFD) (Conceptual-level)

Unbounded-Frame-Succession (−fg−fl)

static FS State
dynamic FS Process/Activity

Bounded-Frame-Succession (+fg−fl)

FS-Change Change (Achievement, ...)

FS-Transition semelfactive bounded process Accomplishment
EVENTS ARE DIFFERENT...

- Single-Frame-Determined (SFD)
  - Non-Focused-Attended (-fg)
    - Mass/Substance (-fl)
  - Focused-Attended (+fg)
    - Aggregate/Collection (+fl)
    - Group (+fl)
    - Object (-fl)
      - Boundary
      - Simple-Object

- Multi-Frame-Determined (MFD) (Conceptual-level)
  - Unbounded-Frame-Succession (-fg-fl)
    - static FS State
    - dynamic FS Process/Activity
  - Bounded-Frame-Succession (+fg-fl)
    - FS-Change Change (Achievement, ...)
    - FS-Transition semelfactive bounded process Accomplishment
LOCATIONALS ARE INTERMEDIATE

- **x over/at/behind... y**
- attentional changes between SFD-entities
  - two possible directions!
DIRECTIONALS

- *out of/ through/ along/ past/ into/ towards/… y, from x to y*

- not necessarily having a 'direction':
  - *around/through the house*

- typically associated with locomotion (verbs)
  - and typically modelled wrt. time

- but: fictive motion
  - *the mountain range goes from Canada to Mexico*
  - *the river runs through the valley*
PROBLEM #1: CLASSIFICATION OF DIRECTIONALS

- Zwarts’ (2008) proposal (only graphical definition):
  - **Source** expressions (*from* *X*, *out of* *X*,…): [++++++ – – – – – –]
  - **Goal** expressions (*to* *X*, *into* *X*,…): [– – – – – –++++++]
  - **Route** expressions (*past* *X*, *over* *X*,…): [– – – – ++++ – – – –]
  - **Comparative** expressions (*towards* *X*, *away from* *X*, *up*, *down*,…): [+++++++++++++]
  - **Constant** expressions (*along/through* *X*,…): [+++++++++++++]
  - **Geometric** expressions (*around* *X*,…): (no pattern diagram)

- Pantcheva (2010)’s extension:
  - **Egressive** expressions (*starting from* *X*,…): [+ – – – – – – – – – – –]
  - **Terminative** expressions (*up to* *X*,…): [– – – – – – – – – – – +]
Some directionals are inherently phasal, locationals fit in the scheme!

- they code the „situational“ spatial structure wrt. some object
- multiple (MFD) description of its spatial property (change)
INHERENT ASPECTS OF DIRECTIONALS, Z.B.
COGNITIVIST PROPOSAL II

- Some directionals are to be characterized **exherently**
  - wrt. **form** aspects: *around* the *house*
  - wrt. **gestalt** aspects (i.e. to relevant dimensions):
    - *along/ across/ up/ down* the *street*
  - wrt. the **previous phase** (exherently phasal):
    - *go* *back*
EXHERENT ASPECTS OF DIRECTIONALS, AXIAL

- Sequential attention to subject’s/object’s spatial referent and some collinear one-dimensional path (e.g. *down*)
- or some one-dimensional path of RO (e.g. *across the street*)
- or some collinear one-dimensional path of RO (e.g. *along the street*)

COGNITIVIST PROPOSAL III

In addition:

- static („ATT“) vs. dynamic („SCAN“, „TRACK“, „TRACE“) attention is assumed to be represented
- usable for semantic distinctions
### CLASSIFICATION GRID/DECISION TABLE AS IN MILLER/J.-L.

<table>
<thead>
<tr>
<th>linguistic expressions (senses)</th>
<th>standard type</th>
<th>Dynamicity of attention wrt. LO</th>
<th>MFD-category</th>
<th>exherent property</th>
<th>Dynamicity of attention wrt. RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locationals</td>
<td>Place</td>
<td>ATT</td>
<td>Local</td>
<td>no</td>
<td>ATT</td>
</tr>
<tr>
<td>through/over/ towards</td>
<td>Constant</td>
<td>SCAN</td>
<td>Continuation</td>
<td>no</td>
<td>ATT</td>
</tr>
<tr>
<td>along/across/up/ around/alongside</td>
<td>Geometric/ Constant</td>
<td>SCAN</td>
<td>Continuation</td>
<td>yes</td>
<td>TRACE</td>
</tr>
<tr>
<td>alongside/ahead of</td>
<td>Constant</td>
<td>SCAN</td>
<td>Continuation</td>
<td>no</td>
<td>TRACK</td>
</tr>
<tr>
<td>from/to/ into/ out of</td>
<td>Source/Goal</td>
<td>SCAN</td>
<td>Change</td>
<td>no</td>
<td>ATT</td>
</tr>
<tr>
<td>past/over</td>
<td>Route</td>
<td>SCAN</td>
<td>Transitory</td>
<td>no</td>
<td>ATT</td>
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<td>across</td>
<td>Route</td>
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<td>Transitory</td>
<td>yes</td>
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</tbody>
</table>

btw.: there is evidence that **from/to** are the sides of a Change-coin

*cp.: We went out of the house (and) into the garden*

*We drove from Hamburg (*and) to Berlin*
WE’VE COME TO THE END, THANK YOU!