Event Semantics and Adverbial Modification

Session 5.2: Spatial Modification

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Problems for Verkuyl (1993)

- She walked\(_{[+ADDTO]}\) (*in/for an hour). atelic because of absence of internal argument (?)
- She pushed\(_{[+ADDTO]}\) \([\text{the cart}]_{[+SQA]}\) (*in/for an hour). atelic despite \([+SQA]\) internal argument
- She walked\(_{[+ADDTO]}\) to the store (in/*for an hour). telic despite absence of internal argument
- She pushed\(_{[+ADDTO]}\) \([\text{the cart}]_{[+SQA]}\) to the store (in/*for an hour). telic, but not because of \([+SQA]\) internal argument
Event shape (Zwarts, 2006)

(see also Jackendoff, 1996; Krifka, 1998; Hay et al., 1999)

- The **shape of an event**: the trajectory or contour that is associated to that event in space or in a scalar or conceptual domain, represented by means of a path.

- A **path** is defined as a continuous function from a real interval \([0,1]\) (the indices of a path) to spatial points (given a particular model of points or regions) where \(p(0)\) is the starting point of the path, \(p(1)\) is its ending point, and for every index \(i\) between 0 and 1, \(p(i)\) is an intermediate point.

- Directional modifiers are not predicates of events but predicates of paths (following Piñón, 1993).
The three dimensions of a motion event

- The path assigned by SHAPE
- The time interval of the event, TIME(e)
- The THEME of the event, the entity that moves

(1) Definition of ‘motion event’ (Zwarts, 2006, 16)
Event e is a motion event, MOTION(e), iff there is a monotone increasing homomorphism h from TIME(e) to [0,1] such that for every \( t \in \text{TIME}(e) \), \( \text{THEME}(e) \) is located at \( \text{SHAPE}(e)((h(t))) \).
The shape function

▶ It is a partial function that assigns unique paths only to those events that involve motion or extension in physical space.
▶ The theme of the event occupies subsequent positions of the path at subsequent stages of the event.
▶ The addition of a PP restricts the set of events denoted by the verb to exactly those events that have a shape that can be found in the set of paths denoted by the PP (2).

\[
(2) \quad \text{[swim across the lake]} = \{ e \in \text{[swim]} : \text{SHAPE}(e) \in \text{[across the lake]} \}
\]

(The SHAPE function is similar to Krifka’s temporal trace function or Jackendoff’s GO-function, relating paths to events.)
PPs can be decomposed into the ontological categories PLACE or PATH, and functions such as TO, FROM, VIA or IN, ON, UP:

- **in the room**: \([\text{Place} \ \text{IN} \ ([\text{Thing} \ \text{ROOM}])])\)
- **into the room**: \([\text{Path} \ \text{TO} \ ([\text{Place} \ \text{IN} \ ([\text{Thing} \ \text{ROOM}])])])\)
- **through the cheese**: \([\text{Path} \ \text{VIA} \ ([\text{Place} \ \text{IN} \ ([\text{Thing} \ \text{CHEESE}])])])\)
Locative and directional PPs

- Only locative PPs can appear with stative verbs:
  (3) a. The box stayed in / on / under / behind the table.
  b. *The box stayed to / into / onto / from / out of / through the table.

- Different directional meanings (Jackendoff, 1983):
  - **Routes** describe a trajectory but not an (initial or final) end-point of the path; e.g. *across, over, through, past, via, along*
  - **Sources** specify where the path starts, e.g. *away from, out of, off, from*
  - **Goals** specify where the path ends, e.g. *to, into, onto, towards*
Locative PPs

- **Regions** (Creary et al., 1985, 1989; Wunderlich, 1991; Herweg and Wunderlich, 1991; Nam, 1995; Kracht, 2008, among others)

- **Vectors** (O’Keefe, 1996; Zwarts, 1997; Zwarts and Winter, 2000; Zwarts, 2005)
Directional PPs

- Atemporal spatial **paths** (Bierwisch, 1988; Verkuyl and Zwarts, 1992; Nam, 1995; Zwarts, 2005, among others)
- **Phase quantifiers** that are independent of time and space (Fong, 1997, 2001)
Zwarts (2005)

- Directional prepositions map the location of the reference object (the Ground) to a set of sequences of vectors, paths, where each of these sequences determines a potential change in position of the located object (the Figure).
- The denotation of a directional PP is treated as an algebraically structured set of paths:
- A path is a function of type $iv$ from the real interval $[0,1] \in \mathbb{R}$ (type $i$) to vectors (type $v$).
Route PPs refer to a path which is located with respect to a particular location (AT, ON, etc. x), but which does not necessarily include endpoints (0 or 1).

\[(4) \{ \text{p: there is an interval } I \subset [0,1] \text{ that includes neither 0 nor 1 and that consists of all the } i \in [0,1] \text{ for which } p(i) \text{ is } \ldots \} \]

- AT x \} = \{\text{via x}\}
- IN x \} = \{\text{through x}\}
- ON x \} = \{\text{across x}\}
- ON/ABOVE x \} = \{\text{over x}\}
- NEAR x \} = \{\text{past x}\}
Goal and source PPs

{ p: there is an interval \( I \subset [0,1] \) including ...

... 0 and consisting of all the \( i \in [0,1] \) for which \( p(i) \) is AT \( x \} = \{ \text{from } x \}

... 0 and consisting of all the \( i \in [0,1] \) for which \( p(i) \) is ON \( x \} = \{ \text{off } x \}

... 0 and consisting of all the \( i \in [0,1] \) for which \( p(i) \) is IN \( x \} = \{ \text{out of } x \}

... 1 and consisting of all the \( i \in [0,1] \) for which \( p(i) \) is AT \( x \} = \{ \text{to } x \}

... 1 and consisting of all the \( i \in [0,1] \) for which \( p(i) \) is ON \( x \} = \{ \text{onto } x \}

... 1 and consisting of all the \( i \in [0,1] \) for which \( p(i) \) is IN \( x \} = \{ \text{into } x \}
Boundedness in the spatial domain


▶ **BOUNDDED, TELIC**: to, into, onto, from, out of, off, away from, past, via
▶ **UNBOUNDDED, ATELIC**: towards, along
▶ **(UN)BOUNDDED, (A)TELIC**: across, around, down, over, through, up

(5) A set of paths \( X \) is *cumulative* iff \( \) (Zwarts, 2005, 751)

(i) there are \( p \) and \( q \in X \) such that \( p + q \) exists and
(ii) for all \( p, q \in X \), if \( p + q \) exists, then \( p + q \in X \).
Fong (1997, 2001)

Directional locative predications (DLs) should not be restricted to spatial movement: There are cases where they also appear in non-motion contexts.

- Some noun phrases can freely be modified by DLs, even though there is nothing in motion: a bridge out of San Francisco
- In some languages, e.g. Finnish, some verbs can demand a DL, even though nothing is moving.
Finnish examples

- Aspectual verbs *begin, end*:

  (6) Toini rupeaa luke-ma-an.
  Toini begins read-INF-ILL
  ‘Toini begins (‘into’) reading.’

- Verbs that presuppose properties of anterior or posterior phases such as *find, forget*:

  (7) Unohdi-n kaku-n uuni-in kahde-ksi tunni-ksi.
  Forgot-1P cake-ACC oven-ILL two-TRA hours-TRA
  ‘I forgot the cake in (‘into’) the oven for two hours.’

- Achievements and Accomplishments in general.
Fong’s proposal

- DLs denote ordered structures, which are interpretable in domains that are diphasic.
- English and Finnish differ in that Finnish DLs can operate on the aspectual (or temporal) structures of the verb, while English DLs cannot.
- The lexical semantics of English and Finnish verbs, however, is considered the same.
Löbner’s (1989) phase quantifiers

- The truth of propositions is time-dependent; phase quantifiers are functions from the time line to the set of truth values \{0, 1\}.

- Given a proposition \( p' \), an interval \( I \) is \textit{admissible} for \( p \) if the truth value changes in \( I \) and (the restriction of \( p \) to the interval \( I \)) is a nonconstant monotonic function from \( I \) to \{0, 1\}. So \( I \) is the disjoint union of two nonempty intervals \( J_0 \) and \( J_1 \) such that \( J_0 \) is entirely before (or entirely after) \( J_1 \), and \( p \) is false in \( J_0 \) and true in \( J_1 \).
An interval is admissible if there is a monotonic phase change from $\neg p$ to $p$ and the truth of the particular DL predicate can be evaluated in the second phase.

\begin{equation}
(8) \text{ into San Francisco} \quad (Fong, 1997, 32)
\end{equation}

$\{I\}$ is an admissible interval in terms of $p$ ($\text{LOC-IN(san francisco})$) and $s$ iff

\begin{enumerate}
\item $I = [s_i, s_e]$ for some $s_i < s_e$
\item $I$ begins with a phase of not-$p$: $\exists s' \in I \forall s \in I (s < s' \rightarrow \neg p(s))$
\item the function $p$ is monotone in the interval $I$: for all $s, s' \in I$, if $p$ is defined for $s, s'$ then if $s < s'$ then $p(s) \rightarrow p(s')$
\end{enumerate}
Admissible intervals for locatives (II)

\[(9) \quad \exists a(\text{bridge}(a)) \text{ and}\]

\(I\) is an interval, which is an ordering of the range of \(\sigma(a)\), and contains one phase change \((p < \sim p)\) with respect to the location of some part of the bridge in San Francisco; and

\(b. \quad \exists s \in I \forall y \in I (y < s \rightarrow \text{LOC-IN}(y, \text{san francisco})) \land \exists s' \in I \forall z \in I (s' < z \rightarrow \neg \text{LOC-IN}(y, \text{san francisco}))\)
from again

Bare *from*-phrases are rather dispreferred:

- John walked from Boston.
- John walked from Boston to Detroit.
- John jumped from the bridge.

Such restrictions do not hold for other source PPs or goal and route PPs:

- John walked out of the house / away (from the car).  SOURCES
- John walked to the store / into the forest.  GOALS
- John walked through the forest / across the bridge.  ROUTES

→ *from*-phrases can only be modifiers.
Combining PPs and verbs

- PPs as **predicate modifiers** (Cresswell, 1978) or Davidsonian **event modifiers** (Rothstein, 2004): PPs are VP modifiers that can measure an event and thus have the potential to render an activity bounded at some level beyond inner aspect.

- PPs (in addition to being VP modifiers) can be **secondary resultative predicates** (Beck, 2005; Gehrke, 2008)

- **BECOME** predicate or some event position associated with something like **BECOME** in the semantics of (at least some) directional PPs (e.g. by Dowty, 1979; Rapp and von Stechow, 1999; Higginbotham, 2000; McIntyre, 2006; Ramchand, 2008, among others)
Problems with **BECOME** in the semantics of directional PPs

- Redundancy
- Empirical problem:

(10)  
a. *John was out of the room.
b. *Mary stayed into the house.
c. *John slept to the door.

- Directional PPs can also be interpreted in domains other than the temporal one as in e.g. *the road to Utrecht*.
- Not all directional PPs involve a transition into a result state (a location).
PPs as predicate/event modifiers (VP adjuncts)
PPs as event modifiers (Beck, 2005, 34)

- Sally slept in the park.
  \[ \lambda e.\text{sleep}_e(S) \land \text{in}_e(\text{the\_park})(S) \]

- Sally walked in the park.
  \[ \lambda e.\text{walk}_e(S) \land \text{in}_e(\text{the\_park})(S) \]

- [in the park] \rightarrow \lambda x.\lambda e.\text{in}_e(\text{the\_park})(x)

A locative PP in combination with a verb: combining two expressions of type \(<e,<i,t>>\) in a conjunctive mode:

- Generalised Predicate Modification (Beck, 2005, 34)
  If \(\alpha = [\beta \gamma]\) and \(\gamma'\) is of type \(<e,<i,t>>\) and \(\gamma'\) is of type \(<e,<i,t>>\), then \(\alpha' = \lambda x.\lambda e.\beta'(x)(e) \land \gamma'(x)(e)\)
Directional PPs as event modifiers (Beck, 2005)

(11) a. Pablo camino hasta la cima.
    Pablo walked up-to [until] the summit
    ‘Pablo walked up to the summit.

b. λe.walk_e(Pablo) & to_e(the_summit)(Pablo)

Building on Cresswell (1978):

- \[\text{[to]}(e)(x)(y) = 1 \text{ iff at end}(e), \ y \text{ is at the final point of a journey } p(e) \text{ that ends at } x\]
- \[\text{[end]} \text{ is that } f: D^{<i>} \rightarrow D^{<i>} \text{ such that for any } e: f(e) = \text{the temporal end point of } e\]
- \[p(e) \text{ (a path or a journey) is a function that maps times that are part of the running time of } e \text{ to a spatial region (the space occupied by the path at the time).}\]
PPs as secondary resultative predicates (V complements)

(Gehrke, 2008)
Rothstein’s (2004) objections

- **Path PPs**: *The Canadians drove to Dam Square.*
  - The PP introduces a bounded path argument which modifies an activity and imposes telicity (due to its being bounded).
  - This is not a case of accomplishment creation, but telicity is derived contextually and not due to the event type involved.

- **Result PPs**: *The people of Amsterdam danced the Canadians to the Dam Square.*
  - The PP is the measure of the incremental process.
  - An accomplishment is derived in the way that is assumed for secondary resultative predication.
Rothstein’s (2004) objections (II)

- A result PP must introduce a path with a determined endpoint and an unbounded path is not acceptable:

  (12) ?They danced the Canadians along the streets of Amsterdam.

- With PPs introducing path arguments that modify the entire event at some higher level, unbounded paths are acceptable:

  (13) He pushed the cart along the street.
Rothstein’s (2004) objections (III)

- A prerequisite for the accomplishment shift involved in resultatives:
  The internal argument of the activity predicate is the subject of the resultative secondary predicate (TPCONNECT).
- The verb *dance* does not have an internal argument.
- With path PPs no additional internal argument (such as a fake reflexive) is added → TPCONNECT cannot hold.
Syntactic evidence for resultative PPs

The general insight that PPs can essentially function as resultatives (predicates of the result state subevent) is intrinsic to a number of approaches (Hoekstra, 1999; Neeleman and van de Koot, 2002; Folli, 2002; Beck, 2005; Tungseth, 2006; Arsenijević, 2006; Gehrke, 2008; Ramchand, 2008, among others), but the implementation of this idea can vary severely from one framework to the other.

- The PP is embedded within the VP and behaves like a complement to V.
- With intransitive verbs like *dance*, the argument surfacing in subject position behaves like an internal argument.
Auxiliary selection

e.g. Dutch and Italian \textbf{HAVE} and \textbf{BE} auxiliaries in perfect tenses (see Hoekstra, 1999, among many others).

- Some verbs in these languages only take one auxiliary
  - Unergative verbs such as \textit{sleep} and transitive verbs such as \textit{eat} combine with \textbf{HAVE}
  - Unaccusative verbs like \textit{fall} combine with \textbf{BE}

- Other verbs take either, depending on particular conditions.

\textit{NB}: Most cases that involve a change in auxiliary selection are treated as argument structure alternations in Levin and Rappaport Hovav (1995).
Auxiliary selection with motion verbs

Many motion verbs in such languages can take either auxiliary.

- **Non-directed motion events correlate with** HAVE, e.g. Dutch:

  (14) a. Zij heeft / *is gewandeld.
      she has / *is walked
      ‘She walked.’

  b. Zij heeft / *is in het bos gewandeld.
      she has / *is in the forest walked
      ‘She walked in(side) the forest.’

- **Directed motion events correlate with** BE, e.g. Dutch:

  (15) Zij *heeft / is naar Tilburg gewandeld.
      she *has / is to Tilburg walked
      ‘She walked to Tilburg.’
Unaccusativity

Perlmutter (1978); Burzio (1981); Hoekstra (1984)

- BE-selection: is the reflex of unaccusativity
- In the underlying structure the surface subject originates in an internal argument position.

(16) a. Het meisje heeft het kopje gebroken.
    the girl has the cup broken
    ‘The girl broke the cup.’

b. Het kopje is gebroken.
    the cup is broken
    ‘The cup broke.’
PP complements vs. adjuncts

Hoekstra (1999): PPs integrated in a motion event in an unaccusative configuration behave like complements and contrast with PPs in adjunct position.

- Dutch complement PPs cannot appear postverbally.

(17) a. ... dat Jan de plant in de vensterbank zette
    that John the plant in the window sill put
    (*in de vensterbank).
    (*in the window sill)
    ‘... that John put the plant on the window sill.’

b. ... dat Jan in de tuin is (*in de tuin).
    that John in the garden is (*in the garden)
    ‘... that John is in the garden.’
(18) a. ... dat Jan zijn vriend (in Amsterdam) ontmoette (in Amsterdam).
that John his friend (in Amsterdam) met (in Amsterdam)
‘... that John met his friends in Amsterdam.’
b. ... dat Jan (naar Groningen) wandelde (naar Groningen).
that John (to Groningen) walked (to Groningen).
‘... that John walked to Groningen.’
(19) a. ... dat Jan naar Groningen {is/*heeft}
    that John to Groningen {is/*has}
gewandeld {is/*heeft}.
walked {is/*has}
‘... that John walked to Groningen.’ COMPLEMENT
b. ... dat Jan {is/(?)heeft} gewandeld
    that John {is/(?)has} walked
{is/(?)heeft} naar Groningen.
{is/(?)has} to Groningen
‘... that John walked to Groningen.’ ADJUNCT (if at all)
Different stress placement with PP adjuncts/complements.

(20)    a. naar GROningen WANdelen
to Groningen walk
‘to walk to Groningen’    PP ADJUNCT

b. naar GROningen wandelen
to Groningen walk
‘to walk to Groningen’    PP COMPLEMENT
PPs with goal and source meanings are complements

(21) a. Jan *heeft / is naar het meer gewandeld.
   John *has / is to the lake walked
   ‘John walked to the lake.’

b. Jan *heeft / is de kamer uit gedanst.
   John *has / is the room out danced
   ‘John danced out of the room.’

c. Jan *heeft / is het meer in gezwommen.
   John *has / is the lake in swum
   ‘John swam into the lake (e.g. from a river).’
Neeleman and van de Koot (2002)

- The only argument with intransitive manner of motion verbs is semantically both the initiator and the undergoer of the movement.
- From a semantic point of view it has traits of arguments that are generally merged in external and internal argument positions.
- If there is no need to have an internal argument, the argument is merged in external argument position and the structure is unergative:

(22) ... dat Jan wandelt.
     that John walks
     dat [Jan [wandelt]]
If a PP is integrated as a resultative secondary predicate and derives an accomplishment structure, there has to be an internal argument that can be both the external argument of the PP (the secondary predicate) and the internal argument of the verb (the main predicate), which undergoes some change measured by the 

\[
(23) \quad \text{... dat Jan naar Tilburg wandelt.}
\]

that John to Tilburg walks

\[
\text{dat } [[\text{Jan}]; [ [ [t]; naar Tilburg] wandelt]]
\]
References I


References II


McIntyre, Andrew. 2006. The integration of directional PPs: Thoughts on the way to getting towards knowing if I’m (be)coming or going. Paper presented at the conference Syntax and semantics of spatial P in Utrecht, June 2006.


References VIII


References IX


