

Where is the path with locative prepositions?

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1 INTRODUCTION

distinction between locative and directional PPs:

in semantics (Jackendoff 1983, Zwarts 1997, Fong 1997, Zwarts & Winter 2000, Zwarts 2005a, 2005b, 2006; Kracht 2005, among others)

- locative PPs denote sets of locations (places)
- directional PPs denote sets of paths made up of locations

in syntax (van Riemsdijk 1978, 1990; Koopman 1997, Huybregts & van Riemsdijk 2002, Helmantel 2002, den Dikken 2003, Svenonius 2004, among others)

- locative Ps head PlacePs
- directional Ps head PathPs that embed PlacePs

⇒ Can prepositions be ambiguous between a directional and a locative reading?

Talmy (1985, 2000): verb-framed vs. satellite-framed languages

- verb-framed languages (e.g. Romance, Semitic, Polynesian): verbs conflate motion and path semantics; manner has to be expressed separately
- satellite-framed languages (e.g. Germanic, Chinese): verbs conflate manner and motion but do not encode path; paths are described by additional elements (PPs, particles, satellites)

⇒ Can (genuinely) Germanic verbs never encode path?

English, Dutch, and German have no spatial prepositions that are lexically ambiguous between a locative and a directional reading

Prepositions like *in, on, under, behind* are locative only

With locative prepositions the meaning of directionality is due to either the directional component provided by certain verbs or by other means (case, syntactic movements, contextual / reference axes)

There are genuinely Germanic verbs that encode path and motion at the same time

Structure of the talk

Section 2: *in, on, under, behind* in English, Dutch and German

Section 3: places and paths in semantics and syntax

Section 4: Ps and the structure of events

Section 5: internal structure of PPs

Section 6: *in, on* vs. *under, behind*

Section 7: conclusion

2 LOCATIVE PPs IN (WEST) GERMANIC

English *in, on*

experimental work (Thomas 2001, 2003; Nikitina 2006):

- directional reading available with non-iterative *jump, throw, put, fall*, etc., henceforth *put*-verbs
- with manner of motion verbs (Levin 1993) like *crawl, walk, swim*, henceforth *swim*-verbs, only locative (similar findings for Norwegian: Tungseth 2006)

- (1) a. Mana jumped **in** the lake. (locative / directional-goal)
b. Mana swam **in** the lake. (locative / *directional)

Dutch *in 'in', op 'on'*

- (2) a. Rick **heeft / is in** het meer **gesprongen**. (locative / directional-goal)
Rick has / is in the lake jumped
'Rick jumped in the lake.'
b. Rick **heeft / ??is** in het meer **gezwommen**. (locative / ??directional)
Rick has / is in the lake swum
'Rick swam in the lake.'

English and Dutch *in, on / op* in directional contexts

English: complex prepositions *into, onto*

Dutch: *in, op* in postposition (cf. van Riemsdijk 1978, Koopman 1997, den Dikken 2003)

- (3) a. Mana swam **into** the lake. (*locative / directional-goal)
b. Rick zwom het meer **in**.

German *in 'in', auf 'on'*

dative vs. accusative case on the DP inside the PP, irrespective of verb class

- (4) a. Magda **schwamm im** See. (locative / *directional)
Magda swam in-the.DAT lake
'Magda swam in the lake.'
b. Magda **sprang im** See.
Magda jumped in-the.DAT lake
~ 'Magda was in the lake and jumped (e.g. up and down).'
- (5) a. Magda **schwamm in den** See. (*locative / directional-goal)
Magda swam in the.ACC lake
'Magda swam into the lake.'
b. Magda **sprang in den** See.
Magda jumped in the.ACC lake
'Magda jumped into the lake.'

English *under* and *behind*

- with *swim*-verbs: locative or directional-route
 - with *put*-verbs: locative or directional-goal
- (6) a. The boat **floated under** the bridge. (locative / directional-route)
b. Mana **kicked** the ball **under** the table. (locative / directional-goal)

German *unter* ‘under’ and *hinter* ‘behind’

- (7) a. Luisa **kickte** den Ball **unter dem** Tisch. (locative / *directional)
Luisa kicked the ball under the.DAT bridge
~ ‘Luisa was under the table and kicked the ball.’
b. Luisa **kickte** den Ball **unter den** Tisch. (*locative / goal / *route)
Luisa kicked the ball under the.ACC table
~ ‘Luisa kicked the ball (to a location) under the table.’
c. Luisa **kickte** den Ball **unter dem** Tisch **durch**. (*locative / *goal / route)
Luisa kicked the ball under the.DAT table through
~ ‘Luisa kicked the ball on a path which lead under the table.’
- (8) a. Das Boot **trieb unter der** Brücke. (locative / *directional)
the boat floated under the.DAT bridge
‘The boat floated under the bridge.’
b. Das Boot **trieb unter die** Brücke. (*locative / goal / *route)
the boat floated under the.ACC bridge
‘The boat floated to (a location) under the bridge.’
c. Das Boot **trieb unter der** Brücke **durch**. (*locative / *goal / route)
the boat floated under the.DAT bridge through
~ ‘The boat floated on a path which lead under the bridge.’

Dutch *onder* ‘under’ and *achter* ‘behind’

- (9) a. Het vliegtuig **vloog onder** de brug. (locative / *directional)
the plane flew under the bridge
~ ‘The plane flew (around) under the bridge.’
b. Het vliegtuig **vloog onder** de brug **door**. (*locative / *goal / route)
the plane flew under the bridge through
~ ‘The plane flew on a path which lead under the bridge.’
c. *Het vliegtuig **vloog** de brug **onder**. (*goal)
the plane flew the bridge under
- (10) a. Het vliegtuig **vloog tot onder** de brug. (goal (?))
the plane flew until under the bridge
‘The plane flew to/until under the bridge.’
b. Zij **schopte** de bal **onder** de tafel. (locative / goal)
she kicked the ball under the table
‘She kicked the ball under the table.’

Data summary

English:	<i>swim</i> -verbs + <i>in</i> / <i>on</i> <i>swim</i> -verbs + <i>under</i> / <i>behind</i> <i>put</i> -verbs + <i>in</i> / <i>on</i> / <i>under</i> / <i>behind</i>	locative locative / route locative / goal
Dutch:	<i>swim</i> -verbs + <i>in</i> / <i>op</i> / <i>onder</i> / <i>achter</i> <i>put</i> -verbs + <i>in</i> / <i>op</i> / <i>onder</i> / <i>achter</i> <i>onder</i> / <i>achter</i> + postposition	locative locative / goal route
German:	<i>in</i> / <i>auf</i> / <i>unter</i> / <i>hinter</i> + DAT <i>in</i> / <i>auf</i> / <i>unter</i> / <i>hinter</i> + ACC <i>unter</i> / <i>hinter</i> + DAT + postposition	locative goal route

difference in verb classes in English and Dutch: *put*-verbs vs. *swim*-verbs
Talmy’s typology leaks: there seem to be genuinely Germanic verbs which encode both motion and path (*put*-verbs) (see also Stringer 2002, Beavers 2003, Folli & Ramchand 2005)
Only English has prepositions that seem to be ambiguous between a directional and a locative meaning (*under*, *behind*) – is this lexical ambiguity?

⇒ **What makes *put*-verbs different from *swim*-verbs?**
⇒ **Why are *under* and *behind* different from *in* and *on*?**

3 PLACES AND PATHS IN SEMANTICS AND SYNTAX

Vector Space Semantics

- Zwarts (2005a): locative (stative) vs. directional (dynamic) prepositions
- Zwarts (1997), Zwarts & Winter (2000): semantics of locative prepositions (similar points have been made by Fong 1997, Kracht 2005, among others)

example: locative PP *behind the house*

set of vectors that go from the house to points behind it
location function (of type $e(vt)$) derives sets of located vectors for locatives, mapping an e -type denotation of the reference object, the complement of P, to a vector (v) that describes its location or dimension

directional PPs denote algebraically structured sets of paths (Zwarts 2005a)

map the reference object to a set of sequences of vectors (paths), each of these sequences determines a potential change in position of the figure

- (11) *A path is a function of type iv from the real interval $[0,1] \subset \mathbf{R}$ (type i) to vectors (type v).*

goal and source prepositions (Zwarts 2005):

- (12) { **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 } = [[from x]]
... 0 and consisting of all the $i \in [0,1]$ for which **p**(i) is **on** x } = [[off x]]
... 0 and consisting of all the $i \in [0,1]$ for which **p**(i) is **in** x } = [[out of x]]
... 1 and consisting of all the $i \in [0,1]$ for which **p**(i) is **at** x } = [[to x]]
... 1 and consisting of all the $i \in [0,1]$ for which **p**(i) is **on** x } = [[onto x]]
... 1 and consisting of all the $i \in [0,1]$ for which **p**(i) is **in** x } = [[into x]]

Such prepositions involve a **two-stage structure**, a negative and a positive phase (see also Fong’s 1997 analysis in terms of phase quantification)

- have exactly one positive phase that overlaps either with the starting point (0) or the ending point (1)
- involve some final location such as AT, ON, IN x

These final locations can be **syntactically** represented as PlacePs that are embedded under PathPs

general consensus for the following structure (give or take functional structure and varying labels):

- (13) [_{PathP} [_{PlaceP} [_{DP}]]]

(Koopman 1997; Helmantel 2002; Huybregts & van Riemsdijk 2002; den Dikken 2003; Svenonius 2004)

4 EVENT STRUCTURE AND PS

assumptions:

- decomposition of events (Pustejovsky 1991, Higginbotham 2000, Ramchand to appear, among others)

⇒ *put*-verbs vs. *swim*-verbs: difference in terms of the event structure associated with these kinds of verbs

- TRACE function** to connect PPs to verbs (Zwarts 2005, citing Krifka 1998, among others):

$$(14) \quad [[V PP]] = \{e \in [[V]] : \text{TRACE}(e) \in [[PP]]\}$$

⇒ the PP restricts the denotation of the verb (a set of events) to those events that have paths in the PP denotation as their trace

4.1 Higginbotham (2000)

Accomplishments are syntactically represented by ordered pairs of positions for events

accomplishment interpretation may stem from **TELIC PAIR FORMATION** $\langle E, E' \rangle$ associated with prepositions rather than with the verbal head

(15) I flew my spaceship to the morning star.
fly (I, my spaceship, e) & to (the morning star, (e, e'))

- the main predicate ‘to’ bears an ordered pair of event positions, the first (process) one of which is identified with the event position in the verb ‘fly’
- ‘fly’ is not ambiguous but only supplies one event position (activity)

⇒ **TRACE function & definition of a to-phrase** (Zwarts 2005a): the *to*-PP restricts the denotation of *fly* (a process) to those events that are transitions into a location (here: *AT the morning star*)

(16) They arrived at the airport.
arrive (x, e) \leftrightarrow ($\exists p$) [at(x,p,e) & ($\exists e'$) (e' is a journey by x & (e, e') is a telic pair)]

- arrive*: predicate applying to (instantaneous) events of being at a place, which constitute the terminus or telos of events of journeying to that place
- the adjunct does not express a result of the arrival, but simply identifies the place in question

(17) a. English *float under the bridge* (ambiguous between locative and directional reading)
|| [float-under x] || = $\lambda y \lambda e \lambda e'$ (float(y,e) & under(y,x,e') & telic-pair(e,e')) [directional reading]

b. Italian *galleggiare sotto il ponte* (unambiguously locative)
|| [galleggia-sotto x] || = $\lambda y \lambda e$ (float(y,e) & under(y,x,e))

- both V and P are unambiguous in both languages (~ process & location)
- directed motion interpretation due to combinatorial operation (telic pair formation)
- semantic parameter: this operation is not available in languages like Italian (~ Talmy’s typology)

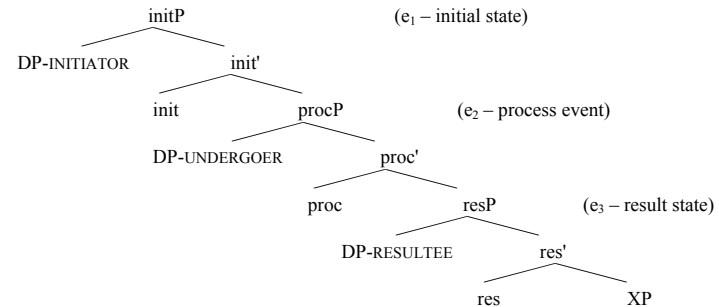
problem: Does (17) b. really involve telic pair formation (recall discussion of (6), but there also seems to be speaker variation, see section 6)?

general issue: What are the restrictions on telic pair formation?

4.2 Ramchand (to appear)

events consist of maximally three subevents, a state (the initial state), a process (the dynamic part) and another state (the result state)

(18) **The syntax / semantics of the first phase** (Ramchand to appear)



all dynamic verbs identify at least a *procP*, the dynamic part of every event

causing subevent (*initP*) and result state subevent (*resP*) are optional – not all verbs can identify these

(19) **Event Composition Rule** (Ramchand to appear:327)

$$e = e_1 \rightarrow e_2 : e \text{ consists of two subevents, } e_1, e_2 \text{ such that } e_1 \text{ causally implicates } e_2$$

the interpretation of states in the event structure as either initial or result state depends on their position in the hierarchical structure:

- state embedded under a process: result state
- state embedding a process: initial state (causative part of the event)

(20) a. $\exists e_1, e_2 [\text{State}(e_1) \& \text{Process}(e_2) \& e_1 \rightarrow e_2] \rightarrow_{def} \text{Initiation}(e_1)$

b. $\exists e_1, e_2 [\text{State}(e_1) \& \text{Process}(e_2) \& e_2 \rightarrow e_1] \rightarrow_{def} \text{Result}(e_1)$

(21) a. $[[res]] = \lambda P \lambda x \lambda e [P(e) \& res'(e) \& \text{State}(e) \& \text{Subject}(x,e)]$

b. $[[proc]] = \lambda P \lambda x \lambda e \exists e_1, e_2 [P(e_2) \& proc'(e_1) \& \text{Process}(e_1) \& e = (e_2 \rightarrow e_1) \& \text{Subject}(x,e_1)]$

c. $[[init]] = \lambda P \lambda x \lambda e \exists e_1, e_2 [P(e_2) \& init'(e_1) \& \text{State}(e_1) \& e = (e_2 \rightarrow e_1) \& \text{Subject}(x,e_1)]$

different elements can supply a result state subevent:

- verbs that can identify *resP* in and by themselves – *find*, semelfactive *jump*, among others
- verbal particles in English (22)
- certain (resultative) adjectives (23)

(22) He ate **up** the chocolate.

(23) He hammered the metal **flat**.

if the event structure contains a result phrase, the event is **telic**, since resultativity entails telicity

N.B.

other types of telicity (Verkuyl & Zwarts 1992, Krifka 1998, Hay et al. 1999, Beavers to appear, Zwarts 2006): generalised homomorphism between events and scales provided by various entities such as objects (DPs), paths (directional PPs), adjectives (e.g. with degree achievements)

4.3 application to the Germanic data

put-verbs: come with a result state subevent; locative P_s can modify this result state
swim-verbs cannot identify resP; locative PPs with *in*, *on* modify the whole event denoted by the VP

(24) put the food on the table

[_{VP} <*the food*> [_V <*put*> [_{resP} <*the food*> [_{res} <*put*> [_{PlaceP} *on the table*]]]]]

- ⇒ meaning of directionality is not associated with the PP itself but is part of the verbal denotation
- ⇒ the event is telic because the verb identifies a resultative event structure

(25) swim into the lake

[_{VP} [_V <*swim*> [_{PathP} *in-to* [_{PlaceP} *t_i the lake*]]]]]

- ⇒ *swim*-verb + *into*-phrase: a process denoted by *swim* leads on a path to a place inside the reference object
- ⇒ the event is telic due to the process being bounded by the bounded directional path it combines with

(26) swim in the lake (structure adapted from Tungseth 2006)

[_{VP} [_{PlaceP} *in the lake*] [_{VP} [_V <*swim*>]]]]]

- ⇒ *in* and *on* are not lexically ambiguous but are locative only
- ⇒ any meaning of directionality is due to additional elements or operations

Huybregts & van Riemsdijk (2002):

an English PP containing *on* is always ambiguous between a purely locative and a directional meaning

evidence: *on*-PP can receive a directional reading in PP-with-NP constructions without any additional element like e.g. a verb providing the meaning of directionality¹

(27) On the table with those plates!

(Huybregts & van Riemsdijk 2002:13)

BUT:

- If such PPs were ambiguous between a directional and a locative reading they should be ambiguous in all contexts, irrespective of the environment they appear in
- in both Dutch and English these PPs in combination with *swim*-verbs can only denote places
Why should a motion verb block a directional reading that should be freely available with these prepositions if they were lexically ambiguous?
- cases like (27) might involve some kind of verb ellipsis or some empty light verb of the *put*-type that enables the path reading

three ways in which VP-internal P elements can be related to the event structure:

- (Germanic) particles identifying a result state subevent
- with *swim*-verbs: a directional PP can denote a path modifying a process
- with *put*-verbs: locative PPs can further modify the result state without PathP

locative PPs with *swim*-verbs: modify the whole event (VP-external modifier, cf. Maienborn 2003)

¹ Dutch seems to behave similarly and can use *in* (*on*) either in preposition or in postposition in such cases: *De gevangenis in met die crimineel!* (Helmantel 2002:35) and *In de gevangenis met die crimineel!*, both meaning 'In the prison with that criminal!' Apparently, with the preposition one stresses the P and with the postposition one stresses *gevangenis*. For a possible semantic difference between such minimal pairs, see Helmantel (2002:72f.). In German, the DP inside the PP in these cases always bears accusative case, hence is marked for directionality.

5 THE INTERNAL STRUCTURE OF PPS

Cases in which a locative preposition can obtain a directional meaning due to additional elements or operations:

- English: adding a directional P *to* to *in*, *on*
- Dutch: *in*, *op* in postposition
- German: accusative vs. dative case

5.1 English and Dutch

English

to: is always directional, denotes a path ending at the point denoted by the reference object
heads a PathP

in, *on*: head PlacePs that can be embedded under a PathP headed by *to* in which cases *in* and *on* move and incorporate into this Path^o to form *into* and *onto* (cf. den Dikken 2003, Svenonius 2004)

(28) [_{PathP} [_{Path} *in-to* [_{PlaceP} [_{Place} *t_i* [_{DP} *the room*]]]]]

Semantics: the *to*-phrase is a path which ends at the location denoted by the *in*-phrase (PlaceP)

Dutch

DP complements of PlacePs headed by *in*, *on* move to Spec PathP to identify / license additional Path structure:

(29) [_{PathP} *de kamer_i* [_{Path} [_{PlaceP} [_{Place} *in* [_{t_i}]]]]]

Semantic effect of the syntactic movement (Helmantel 2002):

- DP in Spec PathP receives a one-dimensional interpretation (in the sense of Verkuyl & Zwarts 1992)
- Only if an object is one-dimensional it can be interpreted as a path

- (30) a. De man is **op de ladder** geklommen. (Helmantel 2002:73)
the man is on the ladder climbed
'The man has climbed onto the ladder.'
b. De man is **de ladder op** geklommen.
the man is the ladder on climbed
'The man has climbed up the ladder.'

Helmantel (2002):

- the prepositional phrase *op de ladder* denotes a 'location, namely the endpoint of the climbing'
- the DP in the postpositional phrase *de ladder op* is 'not a location but rather functions as a path along which the climbing takes place' due to its being in the specifier of a directional phrase
- any element in the specifier of a directional phrase has to be interpreted as one-dimensional (a path)
- elements that cannot be construed as one-dimensional are banned from this position:

- (31) a. Jan stapt **op de kiezelsteen**. (Helmantel 2002:77)
Jan steps on the pebble
'Jan steps on the pebble.'
b. #Jan stapt **de kiezelsteen op**.
Jan steps the pebble on

open issue #1: Is it really true that all objects in postpositional phrases receive a path interpretation?

- (32) De man is **het dak op** geklommen.
the man is the roof on climbed
'The man has climbed onto the roof.'

het dak 'the roof' in the postpositional phrase is not really the path itself but the endpoint of the path

⇒ The claim that any phrase in Spec Path has to receive a path interpretation may be too strong

open issue #2: Why is a similar incorporation of English *under* and *behind* into *to* not possible?

morphological or phonological constraint? (*under* and *behind* are more complex or heavier than *in* and *on*, which could hinder their incorporating into *to*)

- BUT:**
- ⇒ Dutch *onder* ‘under’ and *achter* ‘behind’ cannot appear in postposition to derive a directional goal reading
 - cannot be due to a morphological constraint: the DPs move and the prepositions do not incorporate
 - ⇒ cannot be a semantic constraint:
 - the particular DPs are in principle interpretable as paths and therefore should be able to occupy Spec PathP, if we follow Helmantel (2002)
 - a goal reading is possible with these prepositions in other languages like German

5.2 Case inside German PPs

directional and locative readings of PPs headed by the prepositions under discussion are distinguished by case on the DP inside the PP (ACC and DAT, respectively)

potential problem:

not all directional PPs require ACC
goal and source prepositions *zu* ‘to’, *von* ‘from’ and *aus* ‘out’ take DAT only

(revised) generalisations on the data discussed in Zwarts (2005b)²:

(33) locative Ps + DAT:	<i>bei</i> ‘at’, <i>an</i> ‘at, on’, <i>auf</i> ‘on’, <i>gegenüber</i> ‘across’, <i>hinter</i> ‘behind’, <i>in</i> ‘in’, <i>neben</i> ‘next to’, <i>über</i> ‘over’, <i>unter</i> ‘under’, <i>vor</i> ‘in front of’, <i>zwischen</i> ‘between’
locative Ps + ACC:	---
directional Ps + DAT:	source: <i>aus</i> ‘out’, <i>von</i> ‘from’ genuine goal: <i>nach</i> ‘to’, <i>zu</i> ‘to’
directional Ps + ACC:	genuine route: <i>durch</i> ‘through’, <i>um</i> ‘around’ derived route: <i>über</i> ‘over’ derived goal: <i>an</i> , <i>auf</i> , <i>gegen(über)</i> , <i>hinter</i> , <i>in</i> , <i>neben</i> , <i>über</i> , <i>unter</i> , <i>vor</i> , <i>zwischen</i>

- ⇒ DAT with all locatives and all prepositions that are unambiguously source and goal, i.e. with ‘basic’ ones³
- ⇒ ACC with route prepositions and all directional PPs derived from locative ones
- ⇒ the only locative preposition that cannot additionally appear with the accusative case and thus not derive directionality is *bei* ‘at’ – *an* ‘at’ behaves like all other locatives
- ⇒ almost all the derived meanings involve a goal reading with the sole exception of *über* ‘over’, which gets a route interpretation⁴

² Zwarts (2005b) addresses prepositions that a) have a spatial meaning and b) govern either DAT or ACC. Hence, this excludes Ps that are not spatial, any non-spatial readings of particular prepositions, prepositions that govern the genitive case and finally (separable) prefixes. Therefore, I removed some items from his original list. For example, *entgegen* + DAT ‘against’ is not a spatial preposition but means something like ‘in contrast to’, whereas the spatial ‘against’ is *gegen* + ACC. Whenever *entgegen* is spatial it is a separable prefix since a) under the spatial interpretation it cannot appear in preposition: **entgegen dem Feind kommen* ‘against the-enemy.DAT come’ and b) it cannot combine with just any verb: **Er stellte den Stuhl der Wand entgegen* ‘He put the-chair.ACC the-wall.DAT against’ (rather: *Er stellte den Stuhl gegen die Wand*.ACC) For a similar reason, I removed *außer* + DAT because it means ‘except for’ and not ‘outside’; the spatial meaning of ‘outside’ is rendered by *außerhalb* which governs GEN and should therefore not be included at all. Finally, I left out *entlang* because it governs both GEN and DAT; GEN is more archaic, and DAT seems to take over due to the general loss of GEN in German. The leaving out of these three elements results in my own generalisations under (33).

³ An option is to treat goals and sources as points rather than paths. As argued for in Verkuyll & Zwarts (1992) and Zwarts (2005a) though, goals and their source counterpart would then have the same denotation in cases the ending and the starting points are the same (as in e.g. *to the house* and *from the house*), although they clearly denote different paths. If we treated goals and sources as mere points we would not include the directionality involved in these PPs (e.g. by an ordered set of indices) and lose this distinction.

idea: ACC is a structural case rather than a lexical case under these circumstances

A. den Dikken (2003)

- German ACC and DAT are assigned by functional heads PathP and PlaceP, respectively
- DP inside German PPs involving *zu* ‘to’ bear dative case because the Place head, which is embedded under the PathP, is the closest to assign case to the DP
- in directional contexts that trigger ACC [i.e. with route prepositions and derived directional meanings], no PlaceP is available and the DP is assigned ACC by Path^o

problems:

- ⇒ ad hoc solution: Why would PlaceP be lacking with some (directional) prepositions but not with others?
- ⇒ the derived directional PPs (with the sole exception of PPs involving *über* ‘over’) clearly embed some kind of place since they denote the goal of some path which is a location

B. analogue to Burzio’s Generalization

- correlation according to which verbs without a specifier position are unable to assign structural case:
- (34) a. A verb which lacks an external argument fails to assign accusative case.
b. A verb which fails to assign accusative case fails to Θ -mark an external argument.
(Burzio 1986:178f./184)
- functional head *v* above VP is responsible for both ACC on the internal argument and the introduction of some agent or causer in its specifier position
 - analogous: proposal of *pP* (Ramchand & Svenonius 2002)

C. Peeling theory of Case (Starke, ongoing work, discussed in Caha 2006)

- Case features are privative and organised in a phrase structure tree
 - Individual heads in the case hierarchy: case shells
- (35) [INSTR [ACC [DAT [... [NP]]]]]
- A DP is first merged into the structure bearing an oblique case
 - When DP raises up in the tree it strands (peels off) one case shell in each movement step

D. ACC as marker of a dependency relation between a subject and a predicate

- (36) structural objective (accusative) case is the morphological reflex of a higher order dependency between the subject and its sister (Zwart to appear)
- opposition between the structural cases NOM and ACC in morphology matches the syntactic difference between subjects and objects: objects are hierarchically subordinated to subjects both in syntax and morphology and also the predicate as a whole is dependent on the subject

generalising Zwart’s (to appear) idea to accusative case inside German derived directional PPs

- directional PPs as secondary, non-verbal predicates, i.e. as small clauses predicated over the Theme argument (e.g. Hoekstra 1984, Neeleman 1994)
- ACC signals a dependency between the subject of the non-verbal predicate (the internal argument of the VP) and this secondary predicate, parallel to the relation between nominative subjects and verbal predicates containing a DP bearing ACC
- ACC is a structural case that appears on the internal argument within a predicate to signal the structural relationship between the external argument (the subject) and the predicate

⁴ *Über* ‘over’ is different from *unter* ‘under’: it only gets a route but not a goal reading even with ACC. Furthermore, *über* with an additional postpositional route element can also be used with an ACC DP, although DAT is preferred (see also den Dikken 2003, Zwarts 2005b). Dutch *over* ‘over’ can appear in postposition, in contrast to *onder* ‘under’ or *achter* ‘behind’, and that in this position it gets a route but not a goal reading.

problems:

not all predications involve ACC: *be a teacher* is a predication but *a teacher* is not in the ACC (at least not in languages with morphological case such as German or Russian, where this DP appears in NOM)

⇒ not clear whether such examples have a similar hierarchical structure as the predicates discussed above

with basic directional PPs involving *zu* ‘to’, *aus* ‘out’ and *von* ‘from’, the DP bears DAT and not ACC but these PPs are still secondary predicates over the internal argument of the VP

⇒ the proposal for ACC inside PPs only goes in one direction in the sense that it accounts for the emergence of ACC but not for its absence

⇒ in (25) the internal argument (the undergoer) is not a sister of PathP but in Spec VP (unlike (24))

Accusative case on the DP within the PP signals a subject-predicate dependency in analogue to the relation between nominative subjects and verbal predicates containing accusative DPs.

6 PROJECTIVE VS. NON-PROJECTIVE LOCATIVE PREPOSITIONS

⇒ **non-projective locative Ps:** *in, on, at*

require only spatial knowledge about the location of figure and ground with respect to one another; defined as boundary vectors on sets of points:

- (37) a. $\mathbf{in}' = \lambda A. \lambda v. \text{int}(v, A)$ (Zwarts & Winter 2000:4)
b. $\mathbf{at}' = \mathbf{on}' = \lambda A. \lambda v. \text{ext}(v, A) \wedge |\mathbf{v}| < r_o$
(with $r_o \approx 0$, A as a set of points, v as a boundary vector of A)

⇒ **projective locative Ps:** *over, under, behind*

involve an axis modelled along three orthogonal unit vectors in the vector space V for *up, right, front*

- (38) a. $\mathbf{under}' = \lambda A. \lambda v. \text{ext}(v, A) \wedge c(-up, v) > |\mathbf{v}_{\perp up}|$
b. $\mathbf{behind}' = \lambda A. \lambda v. \text{ext}(v, A) \wedge c(-front, v) > |\mathbf{v}_{\perp front}|$

additional axis element in the definition of projective modifiers enables directional (trajectory) reading

⇒ With projective Ps (e.g. *the boat floated under the bridge*) the location ‘under the bridge’ gets a one-dimensional path reading similar to the extent readings discussed in Gawron (2005)

⇒ non-projective prepositions need additional structure or elements to license a directional reading

other areas where axes play a role:

⇒ eventive and extent readings of extent verbs, degree achievements etc. – need of a ‘*spatial axis*, an ordered set of collinear points that can serve as an *axis of change*’ (Gawron 2005:5f.)

- (39) a. The fog extended from London toward Paris. (ambiguous)
b. Fog gradually covered the city. (event reading only)
c. Fog covered the city for three hours. (extent reading only)
(Gawron 2005:1)

extent reading does not involve any movement, but there is still the need for some axis to describe change that is ‘independent of time’:

- (40) The boiling point of water drops 3 degrees Fahrenheit between sea level and 4000 feet.
(Gawron 2005:6)

⇒ Fong’s (1997) diphasic locatives: need of a perspectival or referential axis:

- (41) a. a bridge **into** San Francisco (Fong 1997:32f.)
b. a bridge **out of** San Francisco

Why is this directional reading with *under, behind* only possible in English but not in Dutch?

- division of labour in Dutch between the preposition *onder* ‘under (location)’ and the circumposition *onder ... door* ‘under (route)’ whereas English only has one element available, *under*⁵
- English can make use of silent elements similar to the Dutch postposition *door* ‘through’ or *langs* ‘along’, whereas in Dutch these elements always have to be overtly expressed

Svenonius (2004): **silent heads TO and VIA** licensed by ‘verbs expressing some kind of motion’

- (42) The clouds **raced beyond** the city limits. (Svenonius 2004:19)
[PathP TO [PlaceP *beyond* [KP [DP *the city limits*]]]]
- (43) [PathP VIA [PlaceP *over* [KP K [DP *the palace*]]]] (Svenonius 2004:15)

problems:

- What are the relevant ‘verbs expressing some kind of motion’?
- Which type of empty head is involved when? Does (42) really involve a goal reading (*to*)?
- Do we want to have empty heads at all?

⇒ Speaker variation: American English (Higginbotham 2000, Svenonius 2004, Nikitina 2006) vs. British English (Thomas 2001, 2003; my informants) ... BUT goal reading in the following case also for BE:

- (44) The race car **raced beyond** the finish line.

7 CONCLUSION

The difference between *swim*-verbs and *put*-verbs can be accounted for in terms of the event structure associated with them: *put*-verbs identify resPs, *swim*-verbs do not.

In German, accusative case on the DP within the PP signals a subject-predicate dependency in analogue to the relation between nominative subjects and verbal predicates containing accusative DPs.

An additional axis element in the definition of projective locatives like *under* or *behind* enables directional (route) readings in English. With non-projective Ps, directional readings have to be licensed independently.

⇒ **Can Germanic verbs encode path?**

Yes. Talmy’s (1985, 2000) leaks: different types can be found in one and the same language.

⇒ **Can prepositions be ambiguous between a directional and a locative reading?**

(Probably) no. Rather there are purely locative prepositions or purely directional prepositions.

In cases where PlacePs can be associated with directionality and thus with some path, this additional Path structure has to be licensed (by movement, case, additional lexical items; contextual axes).

open issues

- Why can Dutch *onder* and *achter* not appear as postpositions? Why is incorporation of English *under* and *behind* into *to* not possible?
- Why can English but not Dutch *under-* and *behind-* phrases obtain a directional reading?
- What kind of verb is *race*? Is *beyond* different from *under / behind*? What is the role of the context?
- Is there a silent *through* with English *under / behind*?
- Do we want to make use of silent elements at all?

⁵ A similar difference is discussed in Zwarts (2003): English has only one preposition for different meanings of *around* whereas Dutch has the two prepositions *om* and *rond*.

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