

Bewegung: Grammatiktheoretische und psycholinguistische Aspekte

Fabian Heck & Gereon Müller

Universität Leipzig
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The Displacement Property of Natural Language

- 1 Observation: Syntactic items do not necessarily show up in the canonical positions in which they are placed by the rules of the base component (e.g., phrase structure rules); they often are **displaced**, (or dislocated), to the left or right periphery.
- 2 Displacement can be viewed as one of the defining properties of **natural languages** (in addition to recursion, double articulation, and compositionality).
- 3 Analysis: **Movement**. There is a connection between the base position and the new, displaced position. This connection may be brought about by genuine movement, or by some other means. (In the latter case, “movement” is just a metaphor.)

- (1) a. “We have two ‘imperfections’ to consider: uninterpretable features and the dislocation property. These properties ... are never built into special-purpose symbolic systems. We might suspect, then, that they have to do with externally-imposed legibility conditions. With regard to dislocation, that has been suggested from the earliest days of modern generative grammar, with speculations about facilitation of processing (on the sound side) and the dissociation of ‘deep’ and ‘surface’ interpretive principles (on the meaning side).
One approach to the array of problems was to distinguish the role of deep and surface structure in semantic interpretation: the former enters into determining quasi-logical properties such as entailment and theta structure; the latter properties such as topic-comment, presupposition, focus, specificity, new/old information, agentive force, and others that are often considered more discourse-oriented, and appear to involve the ‘edge’ of constructions.” (Chomsky (2000))
- b. “Minimalist intuitions lead us to look at the other major imperfection, the uninterpretable inflectional features. Perhaps these devices are used to yield the dislocation property. If so, then the two imperfections might reduce to one, the dislocation property. But the latter might itself be required by design specifications.” (Chomsky (2000))
- c. “Morphology is a very striking imperfection; at least, it is superficially an imperfection. If you were to design a system, you would not put it in. It’s not the only one, though; no formal language, for example, has a phonology or a pragmatics and things like dislocation in the sense we all understand: expressions appear not where you interpret them but somewhere else.” (Chomsky (2002))
- d. “Displacement ... is ubiquitous in language and must be captured in some manner in any theory [...] Displacement is not an ‘imperfection’ of language; its absence would be an imperfection.” (Chomsky (2001a)).
- e. “The operation called “Move” ... comes free, yielding the familiar displacement property of language. That property had long been regarded, by me in particular, as an “imperfection” of language that has to be somehow explained, but in fact it is a virtual conceptual necessity; some version of transformational grammar seems to be the null hypothesis.” (Chomsky (2005b))

Some Instances of Movement

Bewegung erzeugt aus Nebensatzstrukturen im Deutschen Hauptsatzstrukturen (Bierwisch (1963)). Satzeinleitende Konjunktionen (= Komplementierer, C-Elemente) sind mit vorangestellten Verben in **komplementärer Verteilung**.

(2) **Wh-movement in English:**

What do you think that Mary bought ?

(3) **Verb-second movement in German:**

- a. dass Karl das schöne Auto kauft.
- b. Kauft Karl das schöne Auto?
- c. weil Maria den Plan ablehnt.
- d. Lehnt Maria den Plan ab?

(4) **Topicalization in German:**

- a. Kauft Karl das schöne Auto?
- b. Das schöne Auto kauft Karl.
- c. Karl kauft das schöne Auto.
- d. Lehnt Maria den Plan ab?
- e. Den Plan lehnt Maria ab.
- f. Maria lehnt den Plan ab.

Beobachtung:

Transformationen wie *W*-Bewegung müssen im Prinzip über eine beliebig weite syntaktische Strecke hinweg applizieren können ('unbounded dependencies').

(5) **Unbegrenzte Bewegungen:**

- a. Ich weiß nicht, wann du denkst, dass er eintreffen wird.
- b. Wen sagt Maria, dass wir einladen sollten?
- c. Wen denkst du, dass Maria glaubt, dass der Fritz gesagt hat, dass man einladen sollte?
- d. In Hannover glaube ich nicht, dass man so etwas sagt.
- e. Den Fritz meinte sie, solle man einladen.

Movement:

- 1 **successive cyclicity** in the case of displacement phenomena (i.e., Comp-to-Comp movement): modelling of a non-local dependency as a (more) local phenomenon in classic transformational grammar
- 2 **SLASH feature percolation** (Gazdar (1981); Gazdar et al. (1985)): an even more local treatment of movement dependencies developed by Gerald Gazdar in the framework of GPSG (essentially still maintained in HPSG analyses, as in Pollard & Sag (1994)).
- 3 recent analyses within the minimalist program (including Chomsky (2004, 2005a,b, 2007)): like SLASH feature percolation approaches in that displacement phenomena involve **minimal local movement** steps – not only to the **edge of a phase** (i.e., clause or predicate phrase), but actually to the edge of each **XP**
- 4 similar: recent work on **gap phrases** (Koster (2000), Neeleman & van de Koot (2007)).

Movement: Possible Analyses

(6) What do you think that Mary bought ?

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(7) **Unbounded movement** (e.g., Ross (1967)):

[_{CP} What₁ do you think [_{CP} that Mary bought t₁]] ?

(anachronistic notation)

- (6) What do you think that Mary bought ?
- (8) **Successive-cyclic Comp-to-Comp movement** (e.g., Chomsky (1973, 1977, 1981)):
[_{CP} What₁ do you think [_{CP} t'₁ that Mary bought t₁]] ? (anachronistic notation)

(6) What do you think that Mary bought ?

(9) **Successive-cyclic movement to phase edges** (e.g., Chomsky (2000, 2001b), Fox (2000), Nissenbaum (2000), Bruening (2001), Barbiers (2002), **many** others):
[_{CP} What₁ do you [_{vP} t₁^{'''} think [_{CP} t₁^{''} that Mary [_{vP} t₁['] [_{VP} bought t₁]]]]] ?

(6) What do you think that Mary bought ?

(10) **Successive-cyclic movement to phrase edges** (e.g., Sportiche (1989), Takahashi (1994), Agbayani (1998), Bošković (2002), Boeckx (2003), Müller (2004), Chomsky (2004, 2005b)):

[_{CP} What_{t1} do [_{TP} t₁^{''''''} you [_{vP} t₁^{''''''} [_{VP} t₁^{''''''} think [_{CP} t₁^{'''} that [_{TP} t₁^{''} Mary [_{vP} t₁['] [_{VP} bought t₁]]]]]]]]] ?

(6) What do you think that Mary bought ?

- (11) **SLASH feature percolation** (e.g., Gazdar (1981, 1982); Gazdar et al. (1985), Pollard & Sag (1994), Levine & Sag (2003b,a), Müller (2007); also Koster (2000), Neeleman & van de Koot (2007)):

$[_{CP} \text{What}_1 [_{C':s} \text{do} [_{TP:s} \text{you} [_{T':s} T [_{vP:s} t_{you} [_{v':s} v [_{VP:s} \text{think} [_{CP:s} \text{that} [_{TP:s} \text{Mary} [_{T':s} T [_{vP:s} t_{Mary} [_{v':s} v [_{VP:s} \text{bought } t_1]]]]]]]]]]] ?$ (anachronistic notation)

Movement: Possible Analyses

- (6) What do you think that Mary bought ?
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- (11) **SLASH feature percolation** (e.g., Gazdar (1981, 1982); Gazdar et al. (1985), Pollard & Sag (1994), Levine & Sag (2003b,a), Müller (2007); also Koster (2000), Neeleman & van de Koot (2007)):
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(12) **Finitumvoranstellung:**

- a. dass Karl das schöne Auto kauft.
- b. Kauft Karl das schöne Auto?
- c. weil Maria den Plan ablehnt.
- d. Lehnt Maria den Plan ab?

(13) **Topikalisierung:**

- a. Kauft Karl das schöne Auto?
- b. Das schöne Auto kauft Karl.
- c. Karl kauft das schöne Auto.
- d. Lehnt Maria den Plan ab?
- e. Den Plan lehnt Maria ab.
- f. Maria lehnt den Plan ab.

Transformationen

Frage: Wie kann Bewegung abgeleitet werden?

Antwort: durch **Transformationen**

(14) **Transformationen:**

Eine Transformation T nimmt einen Phrasenstrukturbaum P_1 und bildet ihn auf einen anderen Phrasenstrukturbaum P_2 ab.

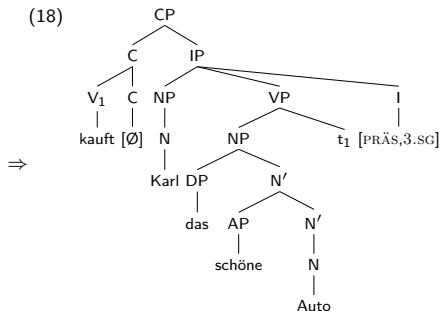
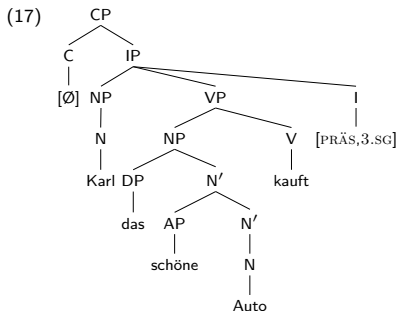
- 1 SB steht für Strukturbeschreibung, engl. 'Structural Description', SD
- 2 SV steht für Strukturveränderung, 'Structural Change', SC.
- 3 X, Y, Z sind Variablen über beliebigen (auch leeren) Ketten von Wörtern.
- 4 t_n steht für eine von der Bewegung des n-ten Elements zurückgelassene **Spur**. (Spur und bewegtes Element werden **koindiziert**.)

(15) **Finitumvoranstellung** (obligatorisch, per Adjunktion):

	X	$C_{[\emptyset]}$	Y	V	Z	
SB:	1	2	3	4	5	\Rightarrow
SV:	1	4	2	3	t_4	5

(16) **Topikalisierung** (obligatorisch, per Substitution):

	X	[expl]	$C_{[dekl]}$	Y	XP	Z	
SB:	1	2	3	4	5	6	\Rightarrow
SV:	1	5	3	4	t_5	6	



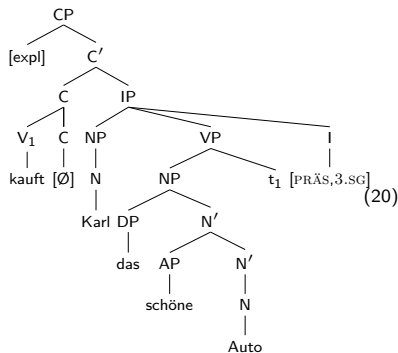
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Bemerkung:

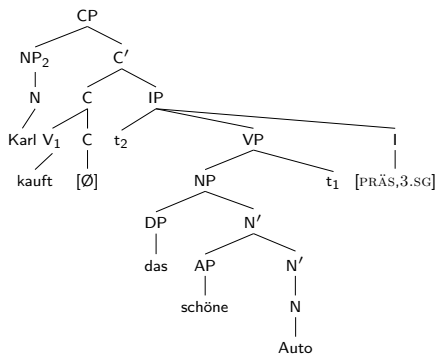
Die Bewegung von V an C heißt **Adjunktion**. Adjunktion kann Strukturen erzeugen, die nicht von den Phrasenstrukturregeln generiert werden können.

Topikalisierung

(19)



⇒



Bemerkungen zu (20):

- Es hätte auch die Objekt-NP *das schöne Auto* bewegt werden können.
- Bisher spricht nichts dagegen, auch zum Beispiel die AP *schöne* zu bewegen. Das Ergebnis ist ungrammatisch, aber dass im Prinzip jede XP bewegt werden kann, zeigt (21).
- Die Bewegung ist **Substitution** in einer bereits existierenden Position. Also brauchen wir noch Phrasenstrukturregeln wie (21).

- (21) a. *Schöne kauft Karl das Auto.
b. Gekauft hat Karl das Auto nicht.
c. Das Auto kaufen will Karl nicht.
d. In Leipzig kauft Karl das Auto.
e. Schön hat Karl geschrieben.
f. Dass er da sein Auto kauft, hätte ich nicht gedacht.

- (22) a. $CP \rightarrow [\text{expl}] C'$
b. $C' \rightarrow C IP$

Eine wichtige Einteilung der Transformationstypen geht auf Emonds (1976) zurück.

(23) Jede Transformation gehört einem der folgenden drei Typen an:

- a. Sie ist **strukturerhaltend** (Substitution).
- b. Sie ist **lokal** (betrifft nur benachbarte Knoten: Adjunktion)
- c. Sie ist eine **Wurzeltransformation** (d.h., nimmt nur auf den Wurzelsatz Bezug: Adjunktion).

- (24) a. (I think) John likes Mary
b. (I wonder) John likes whom
c. (I wonder) whom John likes
- (25) a. (Ich weiß nicht) – Fritz was gesagt hat
b. (Ich weiß nicht) was Fritz gesagt hat
- (26) a. dass Fritz Maria ein Buch gegeben hat
b. [expl] C \emptyset Fritz wem ein Buch gegeben hat
c. [expl] hat-C Fritz wem ein Buch gegeben
d. Wem hat-C Fritz ein Buch gegeben?

Scrambling leitet freie Wortstellung im Deutschen in der IP ab.

- (27)
- a. dass der Fritz der Maria das Buch gegeben hat
 - b. dass der Fritz das Buch der Maria gegeben hat
 - c. dass das Buch der Fritz der Maria gegeben hat
 - d. dass das Buch der Maria der Fritz gegeben hat
 - e. dass der Maria der Fritz das Buch gegeben hat
 - f. dass der Maria das Buch der Fritz gegeben hat

Standardannahme:

Adjunktion einer NP an VP oder IP.

Beobachtung:

Transformationen bilden Phrasenstrukturbäume auf Phrasenstrukturbäume ab; dies ist ein sehr komplexer Mechanismus.

Movement in the Minimalist Program

Assumptions:

- Movement is triggered by appropriate features (which have an **EPP property**, i.e., require a specifier to be created by movement with certain kinds of categories).
- Movement is **required** to be **successive-cyclic** because of a constraint like the PIC, which requires local movement to the closest phase edge.
- Movement is **permitted** to be **successive-cyclic** because one of the following hypotheses holds:
 - 1 EPP features are available for intermediate phase heads (Chomsky (2000, 2001b), Fanselow & Mahajan (2000), Sabel (2000), McCloskey (2002)).
 - 2 Intermediate movement steps can violate the prohibition against non-feature driven movement (Last Resort) so as to satisfy a higher-ranked constraint (Phase Balance, in Heck & Müller (2000, 2003)).
 - 3 Intermediate movement steps are not the result of genuine movement; rather, intermediate traces are inserted into appropriate positions (Chomsky's (1995) Form Chain, Takahashi (1994), Fox (2000), Boeckx (2003)).
 - 4 A new idea (Chomsky (2010), Ott (2011), Fuß & Grewendorf (2011), Blümel (2011)): Intermediate movement steps are required by the need to break symmetry (e.g., determine the head when two categories merge). (Note: On this view, movement is a repair operation, too.)

(28) **Phase Impenetrability Condition** (PIC) (Chomsky (2000, 108), Chomsky (2001b, 13)):

The domain of a head X of a phase XP is not accessible to operations outside XP; only X and its edge are accessible to such operations.

Differences wrt the locality of intermediate movement steps may follow from differences wrt the definition of phases: CP and vP vs., e.g., TP (Richards (2004, 2007)); DP as a possible phase; every XP as a phase.

Motivation of the SLASH feature approach (late 70s):

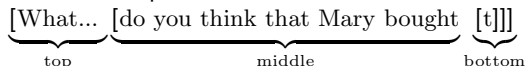
- 1 The complexity of classical transformational grammar (Chomsky (1965)) is due not to the base component (context-free phrase structure rules), but rather to the transformational component (transformations map phrase markers to phrase markers).
- 2 However, transformations seem necessary to model displacement.
- 3 Therefore, the task is to capture displacement phenomena without transformations: SLASH features.

Gazdar's (1981) Original Approach: Derived Categories

The structure of displacement constructions ('movement' is just a metaphor):

- 1 (**top**): landing site of movement
- 2 (**middle**): movement path
- 3 (**bottom**): base position of movement

(29) Movement dependencies:



Let V_N be a set of basic category symbols. The set of **derived categories** $D(V_N)$ is defined as in (30).

(30) **Derived categories:**

$$D(V_N) = \{\alpha/\beta: \alpha, \beta \in V_N\}$$

- Suppose that S and NP are the only kinds of categories.
- Then there are four derived categories:
NP/NP, NP/S, S/NP, S/S.
- What follows the basic category has become known as the **SLASH feature**. The SLASH feature signals that something is missing (and what).

Derived Context-Free Phrase Structure Rules

G is the set of base rules. For each syntactic category β , there is a subset of the set of non-terminal symbols V_N whose members can dominate β according to the rules in G . This set is called V_β ($V_\beta \subseteq V_N$). Then, for each category β ($\beta \in V_N$), a finite set of derived rules $D(\beta, G)$ can be defined.

(31) **Derived Rule Schema** (also cf. 'Slash Introduction Metarule' in Gazdar et al. (1985)):

$$D(\beta, G) = \{[\alpha/\beta \ \sigma_1 \ \dots \ \sigma_i/\beta \ \dots \ \sigma_n]: [\alpha \ \sigma_1 \ \dots \ \sigma_i \ \dots \ \sigma_n] \in G \ \& \ 1 \leq i \leq n \ \& \ \alpha, \sigma_i \in V_\beta\}.$$

Note:

Node admissibility conditions replace phrase structure rules here; this is not really important.

(32) a. Phrase structure rule:

$$S \rightarrow NP VP$$

b. Node admissibility condition:

$$[S \ NP \ VP]$$

Rules

(33) $G =$

- a. $\{[S \text{ NP VP}],$
- b. $[VP \text{ V VP}'],$
- c. $[VP \text{ V NP}],$
- d. $[PP \text{ P NP}],$
- e. $[S' \text{ that S}],$
- f. $[VP \text{ V S}'],$
- g. $[VP' \text{ to VP}],$
- h. $[VP \text{ V NP PP}],$
- i. $[NP \text{ NP PP}] \}$

(35) $D(PP,G) =$

- a. $\{[S/PP \text{ NP/PP VP}], [S/PP \text{ NP VP/PP}],$
- b. $[VP/PP \text{ V VP}'/PP],$
- c. $[VP/PP \text{ V NP/PP}],$
- d. $[PP/PP \text{ P NP/PP}],$
- e. $[S'/PP \text{ that S/PP}],$
- f. $[VP/PP \text{ V S}'/PP],$
- g. $[VP'/PP \text{ to VP/PP}],$
- h. $[VP/PP \text{ V NP/PP PP}], [VP/PP \text{ V NP PP/PP}],$
- i. $[NP/PP \text{ NP/PP PP}], [NP/PP \text{ NP PP/PP}] \}$

(34) $D(NP,G) =$

- a. $\{[S/NP \text{ NP/NP VP}], [S/NP \text{ NP VP/NP}],$
- b. $[VP/NP \text{ V VP}'/NP],$
- c. $[VP/NP \text{ V NP/NP}],$
- d. $[PP/NP \text{ P NP/NP}],$
- e. $[S'/NP \text{ that S/NP}],$
- f. $[VP/NP \text{ V S}'/NP],$
- g. $[VP'/NP \text{ to VP/NP}],$
- h. $[VP/NP \text{ V NP/NP PP}], [VP/NP \text{ V NP PP/NP}],$
- i. $[NP/NP \text{ NP/NP PP}], [NP/NP \text{ NP PP/NP}] \}$

Top, Middle, Bottom

Derived rules regulate the percolation of SLASH features in the **middle**. In addition, rules are needed for the **top** and for the **bottom** of displacement constructions. These latter rules are non-derived rules.

(36) **Bottom** ('SLASH Termination'):

$\langle 4, [\alpha/\alpha \ t], h_\alpha \rangle$

(t = trace; h = denotation of trace)

(37) Features for clausal categories:

a. $[\pm C(\text{omplement}), [\pm R(\text{relative})], [\pm Q(\text{interrogative})]$

b. $S = [-C, -R, -Q]$

c. $S' = [\pm C, -R, -Q]$

d. $R = [+C, +R, -Q]$

(relative clause)

e. $Q_1 = [-C, -R, +Q]$

(root interrogative)

f. $Q_2 = [+C, -R, +Q]$

(embedded interrogative)

(38) Relative clause rule:

$\langle 5, [{}_{NP} \ NP \ R], \lambda R[{}_{NP'}](R') \rangle$

(39) **Top** (for relative clauses):

a. $\langle 6, [R \ (NP_{[\pm wh, +pro]}) \ S/NP], (\dots) \rangle$

b. $\langle 7, [R \ PP_{[+wh, +pro]} \ S/PP], (\dots) \rangle$

Example and Constraints

(40) Movement of an object pronoun:

$[_{NP} [_{NP} \text{the man}] [_{R} [_{NP} \text{that}_{[-wh,+pro]} [_{S/NP} [_{NP} \text{Fido}] [_{VP/NP} [_{V} \text{chased}] [_{NP/NP} \text{t}]]]]]]]$

Constraints can be encoded as restrictions on derived category formation.

(41) **A-over-A Principle** (Chomsky (1964)):

In a structure ... $[_A \dots [A \dots] \dots]$..., an operation can only affect the higher, more inclusive category A.

- (42) a. $[_{DP_1} \text{My letter to } [_{DP_2} \text{a friend in Italy}]]$ got lost
b. $*[_{DP_2} \text{Who}]$ did $[_{DP_1} \text{my letter to } t_2]$ get lost ?

(43) **A-over-A Principle** (Gazdar (1981)):

$\alpha \neq \beta$ in (44) (= (31)).

(44) **Derived rules:**

$D(\beta, G) = \{[\alpha/\beta \sigma_1 \dots \sigma_i/\beta \dots \sigma_n]: [\alpha \sigma_1 \dots \sigma_i \dots \sigma_n] \in G \ \& \ 1 \leq i \leq n \ \& \ \alpha, \sigma_i \in V_\beta\}$.

Beobachtung:

- Bisher kann auf jeder Kategorie nur ein SLASH-Merkmal instantiiert werden. Das leitet die sog. 'one-hole property' ab.
- Topikalisierung und Finitumvoranstellung applizieren aber im Deutschen zusammen (ebenso W-Bewegung und Finitumvoranstellung im Hauptsatz; ebenso Topikalisierung oder W-Bewegung und Scrambling; vgl. (45)).
- Also: SLASH hat als Wert eine Menge von Kategorien, oder es kann mehr als ein SLASH-Merkmal geben.

- (45) a. Karl₁ kauft₂ das t₁ schöne Auto t₂.
b. Was₁ mag₂ Fritz t₁ t₂?
c. Das Buch₁ hat₂ der Maria₃ der Fritz t₃ t₁ gegeben t₂.
d. Was₁ hat₂ ihm₃ der Fritz t₃ t₁ gegeben t₂?

Probleme:

- 1 Natürliche Sprachen sind de facto nicht kontextfrei: **Überkreuzende Abhängigkeiten** im Schweizerdeutschen (Shieber (1985); Beweis über Pumping-Lemma für kontextfreie Sprachen).
- 2 Generalisierte Phrasenstrukturgrammatiken mit nicht weiter restringierten **Metaregeln** sind nicht mehr kontextfrei; sie sind tatsächlich auch unbeschränkte Ersetzungssysteme (Uszkoreit & Peters (1986)).

(46) Jan säit, das mer d'chind₁ em Hans₂ es huus₃ lönd₁ hälfed₂
Jan sagt dass wir [die Kinder [dem Hans [das Haus lassen] helfen]
aastricht₃
anstreichen]

(47) Nicht-kontextfreie Sprachen:

a. $L_1 = \{a^n b^n c^n \mid n \geq 0\}$

b. $L_2 = \{a^n b^m c^n d^m \mid n \geq 0\}$

(schweizerdeutsches Muster)

Die Zahl der Akkusativ-NPs entspricht der Zahl der Akkusativ zuweisenden Verben (ebenso für den Dativ); und (abgesehen von "es huus") gehen alle Akkusativ-DPs allen Dativ-DPs voran, und alle Akkusativ zuweisenden Verben allen Dativ zuweisenden Verben.

Uniform vs. Punctuated Movement Paths

Conclusion:

For standard movement dependencies (i.e., ignoring complications like parasitic gaps and ATB-extraction), current minimalist approaches that envisage movement to all intervening XP edges turn out to be very **similar** to SLASH feature percolation approaches.

(48) A basic difference: **uniform** vs. **punctuated** movement paths (Abels (2003, 2008))

	uniform path	punctuated path
unbounded movement	±	–
comp-to-comp movement	–	+
movement to designated phase edges	–	+
movement to all XP edges	+	–
movement by SLASH feature percolation	+	–

Two kinds of evidence:

- reflexes of successive-cyclic movement
- reflexivization and movement

Reflexes of Successive-Cyclic Movement

Standard assumptions:

- There are **reflexes** of movement (morphological or other).
- These reflexes show up in **designated** positions and thus support theories based on **punctuated** paths.

Some reflexes of movement:

- choice of complementizer in Modern Irish (see McCloskey (1979))
- *wh*-agreement in Chamorro (see Chung (1994))
- partial *wh*-movement in Ancash Quechua (see Cole (1982)), Iraqi Arabic (see Wahba (1982)), and German (if the *wh*-scope marker *was* is actually the realization of a moved *wh*-feature; see Cheng (2000), Sabel (2000))
- obligatory V-to-C raising with (certain types of) *wh*-phrases in Spanish (see Torrego (1984), Baković (1998)) and Basque (see Ortiz de Urbina (1989))
- selection of subject pronouns in Ewe (see Collins (1993, 1994))
- tonal downstep in Kikuyu (see Clements, McCloskey, Maling & Zaenen (1983))
- *meN* deletion in colloquial Singapore Malay (see Cole & Hermon (2000))
- *wh*-copying in German (see Fanselow & Mahajan (2000))
- obligatory CP extraposition in German (see Müller (1998))
- stranding in Dutch (see Barbiers (2002))

Reflexes of Successive-Cyclic Movement: Ewe

However:

It is not always clear that the reflex of movement can be tied to standard phase edges. For instance, movement in Ewe affects SpecT (i.e., the TP domain): Optionally, a different form of subject pronoun can be chosen if movement to SpecC takes place (see Collins (1993, 1994)).

(49) Focus movement and subject pronoun choice in Ewe:

Kofi₁ e me gble [_{CP} t'₁ be [_{TP} é/wo fo t₁]]
Kofi FOC I said that he hit

'It was Kofi that I said that he hit.'

(50) Subject pronoun choice without focus movement in Ewe:

a. Kofi₁ e me gble na t₁ [_{CP} be é fo Kosi]
Kofi FOC I said to that he hit Kosi

'It was Kofi that I told that he hit Kosi.'

b. *Kofi₁ e me gble na t₁ [_{CP} be wo fo Kosi]
Kofi FOC I said to that he hit Kosi

'It was Kofi that I told that he hit Kosi.'

Consequence: It is unclear whether reflexes of movement can be taken to argue for punctuated paths.

(51) Pit-stop reflexive (Barss (1986)):

- a. *Jane believes (that) John₁ thinks (that) she likes some pictures of himself₁
- b. Which pictures of himself₁ does Jane believe (that) John₁ thinks (that) she likes?
- c. *Mary told John₁ that she liked these pictures of himself₁
- d. Which pictures of himself₁ did Mary tell John₁ that she liked?

Consequences:

- 1 Reflexivization must be possible in intermediate positions.
- 2 The examples in (51) cannot yet decide between a punctuated and a uniform approach (the latter can postulate the relevant information in SpecC).

Claim (Abels (2003, 2008)):

There is an argument for punctuated paths on the basis of **raising constructions**.

(52) **Pit-stop reflexive with a seem experiencer:**

- a. [Which pictures of himself]₁ did it seem to John [CP □ that Mary liked t₁] ?
b. *[Which pictures of himself]₁ did Mary₂ seem to John [TP (□) t₂ to like t₁] ?

Assumption:

Raising infinitives are TPs (not CPs).

Argument:

- 1 Uniform approach: Reflexivization should be possible via the □ position (SpecT, or TP[SLASH:NP]) in (52-b).
- 2 Punctuated approach: Reflexivization should be impossible in (52-b) if SpecT is not a landing site for successive-cyclic movement (e.g., if it is not a phase edge).
- 3 (52-b) is ungrammatical, which supports a punctuated approach.

(28) Pit-stop reflexive with a seem experiencer:

- a. [Which pictures of himself]₁ did it seem to John [_{CP} □ that Mary liked t₁] ?
b. *[Which pictures of himself]₁ did Mary₂ seem to John [_{TP} (□) t₂ to like t₁] ?

However:

- 1 When **which picture of himself** in (52-b) moves to SpecT (in a uniform approach), the intervening subject **Mary** is still present.
- 2 **Mary** is also still present when the intended antecedent **John** is merged.
- 3 Therefore, **Mary** will intervene, and block binding of the reflexive by **John** (as a closer potential antecedent) even if **which picture of himself** moves to SpecT (or TP has the appropriate SLASH feature), given either m-command or tucking-in after wh-movement to SpecT.
- 4 It is unlikely that there can be a subsequent step in the derivation where **Mary** ceases to be an intervener and permits binding of the reflexive by **John**.

Consequence: It is unclear whether pit-stop reflexives can be taken to argue for punctuated paths.

Another Problem with the Pit-Stop Reflexive Argument

(53) *Which pictures of himself₁ did Mary₂ seem to Jane₃ [_{TP} t₂ to have told John₁ [_{CP} □ that she likes t]] ?

Problem (Boeckx & Grohmann (2007), Boeckx (2008), Abels & Bentzen (2011)):
Sentences like (53) also lack the enrichment of binding options by movement to intermediate positions although the most deeply embedded clause is a CP, and movement to the □ position of this CP domain should suffice for creating the new binding option. This would seem to suggest that the correct generalization is that an intervening experiencer blocks the enrichment of binding options, quite independently of the nature of the landing site involved.

(54) **Scrambling to Specv/SpecV** (optional):

- a. [CP dass [TP [vP das Buch₁ [v' keiner [VP t₁ gelesen hat] v]]]]
- b. [CP dass [TP [vP der Fritz [VP das Buch₁ der Maria t₁ gegeben hat] v]]]]

Some Movement Types in German

(54) **Scrambling to Specv/SpecV** (optional):

- a. [_{CP} dass [_{TP} [_{vP} das Buch₁ [_{v'} keiner [_{VP} t₁ gelesen hat] v]]]]
- b. [_{CP} dass [_{TP} [_{vP} der Fritz [_{VP} das Buch₁ der Maria t₁ gegeben hat] v]]]]

(55) **Dative Shift to SpecAppl** (obligatory if it exists):

- [_{CP} dass [_{TP} [_{vP} der Fritz [_{AppIP} der Maria₂ [_{VP} das Buch₁ t₂ gegeben hat] Appl] v]]]]

(54) **Scrambling to Specv/SpecV** (optional):

- a. [CP dass [TP [vP das Buch₁ [v' keiner [VP t₁ gelesen hat] v]]]]
- b. [CP dass [TP [vP der Fritz [VP das Buch₁ der Maria t₁ gegeben hat] v]]]]

(55) **Dative Shift to SpecAppl** (obligatory if it exists):

[CP dass [TP [vP der Fritz [ApplP der Maria₂ [VP das Buch₁ t₂ gegeben hat] Appl] v]]]]

(56) **Unstressed Pronoun Fronting to phonological edge of vP**:

[CP dass [TP [vP es₁ [v' ihm₂ [v' der Fritz [VP t₂ t₁ gegeben hat] v]]]]]]

Some Movement Types in German

(54) **Scrambling to Specv/SpecV** (optional):

- a. [_{CP} dass [_{TP} [_{vP} das Buch₁ [_{v'} keiner [_{VP} t₁ gelesen hat] v]]]]
- b. [_{CP} dass [_{TP} [_{vP} der Fritz [_{VP} das Buch₁ der Maria t₁ gegeben hat] v]]]]

(55) **Dative Shift to SpecAppl** (obligatory if it exists):

[_{CP} dass [_{TP} [_{vP} der Fritz [_{ApplP} der Maria₂ [_{VP} das Buch₁ t₂ gegeben hat] Appl] v]]]]

(56) **Unstressed Pronoun Fronting to phonological edge of vP**:

[_{CP} dass [_{TP} [_{vP} es₁ [_{v'} ihm₂ [_{v'} der Fritz [_{VP} t₂ t₁ gegeben hat] v]]]]]]

(57) **NP-movement to SpecT**:

[_{CP} dass [_{TP} der Fritz₁ [_{vP} es ihm t₁ [_{VP} t t gegeben hat] v]]]]

Some Movement Types in German

(54) **Scrambling to Specv/SpecV** (optional):

- a. [CP dass [TP [vP das Buch₁ [v' keiner [vP t₁ gelesen hat] v]]]]
- b. [CP dass [TP [vP der Fritz [vP das Buch₁ der Maria t₁ gegeben hat] v]]]]

(55) **Dative Shift to SpecAppl** (obligatory if it exists):

- [CP dass [TP [vP der Fritz [ApplP der Maria₂ [vP das Buch₁ t₂ gegeben hat] Appl] v]]]]

(56) **Unstressed Pronoun Fronting to phonological edge of vP:**

- [CP dass [TP [vP es₁ [v' ihm₂ [v' der Fritz [vP t₂ t₁ gegeben hat] v]]]]]]

(57) **NP-movement to SpecT:**

- [CP dass [TP der Fritz₁ [vP es ihm t₁ [vP t t gegeben hat] v]]]]

(58) **Wh-movement to SpecC:**

- a. [CP Wen₁ [C hast] [TP [vP du [vP t₁ getroffen t] v]]] ?
- b. Ich weiß nicht [CP wen₁ C [TP du [vP t₁ getroffen hast] v]]]]

Some Movement Types in German

(54) **Scrambling to Specv/SpecV** (optional):

- a. [CP dass [TP [vP das Buch₁ [v' keiner [vP t₁ gelesen hat] v]]]]
- b. [CP dass [TP [vP der Fritz [vP das Buch₁ der Maria t₁ gegeben hat] v]]]]

(55) **Dative Shift to SpecAppl** (obligatory if it exists):

- [CP dass [TP [vP der Fritz [ApplP der Maria₂ [vP das Buch₁ t₂ gegeben hat] Appl] v]]]]

(56) **Unstressed Pronoun Fronting to phonological edge of vP:**

- [CP dass [TP [vP es₁ [v' ihm₂ [v' der Fritz [vP t₂ t₁ gegeben hat] v]]]]]]

(57) **NP-movement to SpecT:**

- [CP dass [TP der Fritz₁ [vP es ihm t₁ [vP t t gegeben hat] v]]]]

(58) **Wh-movement to SpecC:**

- a. [CP Wen₁ [C hast] [TP [vP du [vP t₁ getroffen t] v]]] ?
- b. Ich weiß nicht [CP wen₁ C [TP du [vP t₁ getroffen hast] v]]]]

(59) **Topicalization to SpecTop:**

- a. [TopP Den Fritz₁ [C habe] [TP [vP ich [vP t₁ getroffen t] v]]]]
- b. [TopP Fritz₁ [C schläft] [TP [vP t₁ [vP t] v]]]]

More Movement Types in German

- (60) **Relativization to SpecC_[rel]**:
Das ist [_{DP} ein Rad [_{CP} das₁ ich t₁ gern mag]]

More Movement Types in German

(60) **Relativization to SpecC_[rel]:**

Das ist [DP ein Rad [CP das₁ ich t₁ gern mag]]

(61) **Left Dislocation to SpecTop/SpecC:**

[TopP Den Fritz₁ Top [CP den₁ hat [TP [vP sie [VP t₁ getroffen t] v]]]]

More Movement Types in German

- (60) **Relativization to SpecC_[rel]**:
Das ist [DP ein Rad [CP das₁ ich t₁ gern mag]]
- (61) **Left Dislocation to SpecTop/SpecC**:
[TopP Den Fritz₁ Top [CP den₁ hat [TP [vP sie [VP t₁ getroffen t] v]]]]
- (62) **Extrapolation to XP-Right-Adj**:
- Er hat t₁ gesagt [CP₁ dass er falsch lag]
 - Ich habe [DP eine Frau t₁] getroffen [CP₁ die Gärten mag]
 - Sie hatte schon t₁ gerechnet [PP₁ damit]
 - Da₁ hatte keiner t₂ gerechnet [PP₂ t₁ mit]
 - [VP [DP Hunde t₁] füttern [CP die bellen] sollte man nicht t

More Movement Types in German

- (60) **Relativization to SpecC_[rel]:**
Das ist [_{DP} ein Rad [_{CP} das₁ ich t₁ gern mag]]
- (61) **Left Dislocation to SpecTop/SpecC:**
[_{TopP} Den Fritz₁ Top [_{CP} den₁ hat [_{TP} [_{vP} sie [_{VP} t₁ getroffen t] v]]]]
- (62) **Extrapolation to XP-Right-Adj:**
- Er hat t₁ gesagt [_{CP₁} dass er falsch lag]
 - Ich habe [_{DP} eine Frau t₁] getroffen [_{CP₁} die Gärten mag]
 - Sie hatte schon t₁ gerechnet [_{PP₁} damit]
 - Da₁ hatte keiner t₂ gerechnet [_{PP₂} t₁ mit]
 - [_{VP} [_{DP} Hunde t₁] füttern [_{CP} die bellen] sollte man nicht t
- (63) **Wh-Movement to outer SpecC at LF:** [_{CP} was₂ [_{C'} wem₁ [_C hat] [_{TP} [_{vP} sie [_{VP} t₁ t₂ gegeben t]]]]] ?
- (64) **Quantifier Raising to outer Spec(C/T/v) at LF:**
- dass mindestens eine Frau jeden Mann hasst (reading: $\forall \succ \exists$)
 - Mindestens eine Frau hasst jeder Mann (reading: $\forall \succ \exists$)

Conclusion: Different movement types are typically defined by different landing sites (and/or different items that undergo the operation, and/or different levels where the movement takes place).

A Y Model of the Course

1 Part A: Foundations (Heck & Müller)

- constraints on movement
- variable behaviour of movement types (incl. constraints against improper movement and constraints on the moved item)

2 Part B: Extensions

- B1: The Properties of Movement in German (Heck)
- B2: Psycholinguistic Approaches to Movement (Müller)

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