On the Constructional Residue of Rule-Based Grammars

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Constructions

(1) Construction:
A linguistic expression Γ is a construction if (a) and (b) hold.

a. There is evidence that Γ is composed of smaller parts α_1 – α_n.
b. The formal or functional properties of Γ cannot be determined on the basis of the properties of α_1 – α_n.

Prototypical constructions: idioms

Standard assumption in rule-based grammars:

1. Γs that are constructions belong in the lexicon.
   - The unpredictable properties of constructions must be captured by special lexical rules (Chomsky (1980)), or by postulating listed syntactic objects (DiSciullo & Williams (1987), Jackendoff (1997)).
2. Γs that are not constructions are generated in a rule-based part of a grammar.
   - If the properties of a linguistic expression are fully preditable on the basis of the properties of its components, the linguistic expression does not exist in the lexicon but is derived by grammatical rules (in the structure-building components morphology and syntax).

State of Affairs

Conceptual problem: an inhomogeneous theory, with two possible sources for complex linguistic expressions: lexicon vs. grammatical rules.

Radical ways out:

- The role of constructions is strengthened (Jackendoff (1997, 2002), Culicover & Jackendoff (2005)), such that constructions may cover most, or even all, of what is traditionally derived by rule-based systems (Ackerman & Webelhuth (1998), Goldberg (2003, 2006), Tomasello (2003), among many others).
- The role of rules is strengthened, such that rules may cover most, or even all, of what is usually accounted for by invoking constructions.

Claim:

- Closer inspection of apparent constructions often reveals that rule-based accounts can and should be given after all, provided that grammatical rules are of a highly abstract nature.
- If this result can be generalized, the role of constructions may be minimal: Only morphemes are constructions (and need to be stored in the lexicon); all other linguistic expressions are derived by grammatical rules in morphology or syntax.

Double Articulation: Morphemes as Constructions

One of the defining properties of natural language (next to recursion; cf. Chomsky (1957), Hauser et al. (2002), Friederici et al. (2006)):

(2) Double Articulation (Martinet (1964), Eisenberg (2000), Williams (2005)): Linguistic expressions can be encoded at two different levels: They can be separated into minimal units that bear meaning (morphemes) and into minimal units that distinguish meaning (phonemes).

Double articulation ensures that discrete infinity can be gained on the basis of a very small inventory of primitive items.

Conclusion:
All morphemes (that consist of more than one phoneme) are constructions because although grammatical rules restrict the combination of phonemes into morphemes (phonology), the properties of a morpheme cannot be predicted on the basis of the properties of its parts, and morphemes must thus be stored.

Hypothesis:
Only morphemes are constructions.

Overview

Four case studies from German:

- suppletive verb inflection: b-ɪ-n, b-ɪ-s-t
- irreversible binomials: fix und fertig, *fertig und fix
- transformational deficiency: *dass Fersengeld von ihm gegeben wurde, dass ihm von ihr ein Korb gegeben wurde
- clause structure parallelism: Halb zog sie ihn, halb sank er hin, *Halb zog sie ihn, er sank halb hin

Result: In all four cases,

1. there is evidence that the relevant linguistic expressions are composed of smaller parts;
2. there are aspects of the form of the relevant linguistic expressions that look unpredictable at first sight;
3. closer scrutiny reveals that a rule-based account is both viable and empirically superior (because it correctly predicts restrictions on variation).

Caveat

- To prove such an approach viable, one must argue that both formal and interpretational properties of seemingly irregular linguistic expressions can be shown to be systematic after all.
- I will have nothing interesting to say about the latter issue.

(3) Techniques for a compositional interpretation of idioms (see Ruhl (1975), Chomsky (1980), Pesetsky (1985), Gazdar et al. (1985), Everaert (1991), Nunberg et al. (1994), Sailer (2003) for various versions and complications):

a. spill the beans:
   (i) spill means 'divulge' in the context of beans
   (ii) beans means 'information' in the context of spill.

b. kick the bucket:
   (i) kick can mean 'die' in the context of bucket.
   (ii) bucket is an expletive in the context of such a die (or the identity function).
   (iii) the is an expletive in the context of an expletive (other cases of expletive articles: nominal predicates).

My main focus is on formal properties of complex linguistic expressions in the morphology and syntax of German that seem to resist rule-based accounts.

Background Assumptions

Assumption:

- derivational, minimalist grammar (Chomsky (1995, 2001, 2005))
- with local optimization procedures (Heck & Müller (2000, 2003, 2007)) and
- a post-syntactic morphological realization of functional heads (distributed morphology; Halle & Marantz (1993, 1994), Noyer (1992), Halle (1997), Harley & Noyer (2003), Embick & Noyer (2001)).

(4) Organization of Grammar:

a. lexicon: list of morphemes, no rules
b. numeration: selection of morphemes, enrichment of morphemes with non-inherent features, derivational morphology, composition
c. syntactic derivation: Merge, Move, Agree plus optimization of all XPs (XPs as cyclic nodes); perhaps also parts of derivational morphology, composition
d. inflectional morphology
e. (phonological realization, semantic interpretation)

German Verb Inflection: Weak and Strong Paradigms

(5) a. Weak conjugation
glauben ('believe')

	Präsens	Präteritum
1.Sg	glaub-e	glaub-te
2.Sg	glaub-s-t	glaub-te-s-t
3.Sg	glaub-t	glaub-te
1.Pl	glaub-en	glaub-te-n
2.Pl	glaub-t	glaub-te-t
3.Pl	glaub-en	glaub-te-n

b. Strong conjugation
rufen ('call')

	Präsens	Präteritum
1.Sg	ruf-e	rief
2.Sg	ruf-s-t	rief-s-t
3.Sg	ruf-t	rief
1.Pl	ruf-en	rief-en
2.Pl	ruf-t	rief-t
3.Pl	ruf-en	rief-en

Observation: There are many instances of syncretism in these paradigms.

1. All cases of syncretism (incl. partial (or block) syncretism with s-t) can be derived with the endings of the weak and strong conjugations, given feature decomposition (which yields natural classes) and underspecification (Bierwisch (1961), Wiese (1994), Wunderlich (1996), Eisenberg (2000), Frampton (2002), Müller (2006)).
2. Stem alternation with strong verbs also emerges as fully systematic (Ross (1967), Ségéral & Scheer (1998), Wiese (2006)).
(Also see Halle & Marantz (1993) vs. Albright & Hayes (2002) vs. Pinker (1991) on strong verbs in English.)

German Verb Inflection: Suppletive Paradigm

(6) Suppletive conjugation
sein ('be')

	Präsens	Präteritum
1.Sg	bin	war
2.Sg	bist	warst
3.Sg	ist	war
1.Pl	sind	waren
2.Pl	seid	wart
3.Pl	sind	waren

Observation:
There is evidence that the individual word forms are composed of smaller units: partial syncretism.

Partial Syncretism in the Suppletive Paradigm: Subanalysis

(7) Pike's (1965) subanalysis of verb inflection with *sein* ('be') in German:

1.sg	b		ɪ	n	
2.sg	b		ɪ	s	t
3.sg			ɪ	s	t
1.pl	z		ɪ	n	t
2.pl	z	a	ɪ		t
3.pl	z		ɪ	n	t
inf	z	a	ɪ	n	

Claim (Baerman et al. (2005)):
"Whatever the merits of such an analysis, it is not one which is compatible with most morphological models".

Side remark: Pike's (1965) article contains two further analyses of inflectional phenomena in German: a subanalysis of definite article inflection (der, die, das, etc), and a subanalysis of personal pronouns, including suppletion phenomena (ich, mich, mir, meiner, etc.).

Observation: Pike-style analyses have independently been developed for these phenomena in current morphological theories:

- Wunderlich (1997a), Wiese (1999) on the inflection of definite articles
- Wiese (2001), Fischer (2006) on the inflection of personal pronouns

Subanalysis in Current Morphological Theories

Question:
Do we have to assume that the verb forms in (7) are morphological constructions?

Answer:
Probably not:

Subanalysis is pursued in many current morphological theories:

- Distributed Morphology: noun inflection in Latvian and Russian (Halle (1992, 1994)), Afro-Asiatic prefix conjugation (Noyer (1992)), argument encoding markers on verbs in Georgian and Potawatomi (Halle & Marantz (1993)), Spanish object clitics (Halle & Marantz (1994)), verb inflection in Kiowa (Harbour (2003)), noun inflection in Icelandic (Müller (2005)), verb inflection in Menominee (Trommer (2006b), Nevins (2007)), various other phenomena (papers collected in Müller & Trommer (2006))
- Paradigm Function Morphology (and other stem-and-paradigm approaches): Bulgarian verb inflection (Stump (2001)), argument encoding markers on verbs in Georgian and Potawatomi (Anderson (1992))
- Minimalist Morphology (Wunderlich (1996, 1997b))

Distributed Morphology: Background Assumptions 1

(8) Late vocabulary insertion:

a. Functional morphemes like v, Agr, and T contain fully specified bundles of morpho-syntactic features in syntax; however, they do not yet contain phonological material.

b. Inflection markers are vocabulary items that pair phonological and (often underspecified) morpho-syntactic features; they are inserted post-syntactically in accordance with the Subset Principle.

(9) Subset Principle (Halle (1997)):
A vocabulary item V is inserted into a functional morpheme M iff (i) and (ii):

(i) The morpho-syntactic features of V are a subset of the morpho-syntactic features of M.
(ii) V is the most specific vocabulary item that satisfies (i).

(10) Specificity of vocabulary items (Lumsden (1992), Noyer (1992), Wiese (1999)):
A vocabulary item V_i is more specific than a vocabulary item V_j iff there is a class of features $\mathbb{F}$ such that (i) and (ii) hold.

(i) V_i bears more features belonging to $\mathbb{F}$ than V_j does.
(ii) There is no higher-ranked class of features $\mathbb{F}'$ such that V_i and V_j have a different number of features in $\mathbb{F}'$.

Distributed Morphology: Background Assumptions 2

(11) Feature hierarchy (for determining specificity):
Tense > Person > Number

Assuming vocabulary insertion to be post-syntactic opens up the possibility of operations applying after syntax but before morphological insertion that change the morphosyntactic feature specification. This derives systematic mismatches between morphology and syntax.

(12) Impoverishment (Bonet (1991), Halle & Marantz (1993, 1994), Bobaljik (2002), Frampton (2002)):
Morpho-syntactic features can be deleted post-syntactically before vocabulary insertion takes place; this effects a "retreat to the general case".

(13) Fission (Noyer (1992), Frampton (2002), Müller (2005)), not Halle & Marantz (1993)):
If insertion of a vocabulary item V with the morpho-syntactic features β takes place into a fissioned morpheme M with the morpho-syntactic features α, then α is split up into β and α–β, such that (a) and (b) hold:

a. α–β is available for further vocabulary insertion.
b. β is not available for further vocabulary insertion.

- All functional heads in German are subject to fission.
- This increases the possibilities for subanalysis (in addition to the presence of functional heads).

Feature Decomposition and Natural Classes

(14) Person features:

a. There are three features: [±1], [±2], [±3]
(Noyer (1992), Wiese (1994), Frampton (2002)), Trommer (2006a,b), Nevins (2007)).

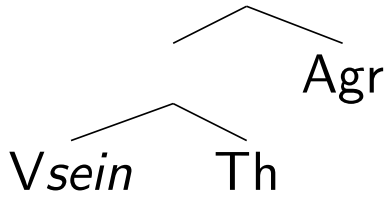
b. Cross-classification yields eight possible persons in the world's languages; some combinations are semantically excluded.

c. All combinations of persons (including first person inclusive) can form a natural class, reflected in syncretism patterns (Cysouw (2003), Baerman et al. (2005)).

d. Vocabulary items can bear underspecified person information and thus encode natural classes of persons; this derives instances of syncretism.

Structure for Analysis

(15) Structure before vocabulary insertion:



Assumptions:

1. At least in the case of sein ('be'), V is filled only post-syntactically, by vocabulary insertion.
2. Th is a theme vowel position associated with the lexical head (Halle (1992, 1994), Halle & Marantz (1994), Oltra Massuet (1999), Oltra Massuet & Arregi (2005)). Th may be base-generated or enter the derivation by dissociation, and it may or may not project.
3. Agr contains Φ-features (relevant in the present contexts are person and number, which can be morphologically realized)
4. I abstract away from a possible T since I focus on present tense inflection here.

Analysis: Vocabulary Items

(16) Vocabulary insertion rules in Distributed Morphology

a. (i) /b/ ↔ V*sein* /__ [–3,–pl]
   (ii) /z/ ↔ V*sein* /__ [+pl]

b. (i) /a/ ↔ [+β] /__ V*sein*, [–1,+2,+pl]
   (ii) /ɪ/ ↔ [+α] /__ V*sein*

c. (i) /Ø/ ↔ [–1,+2] /__ V*sein*, [+pl]
   (ii) /s/ ↔ [–1] /__ V*sein*, [–pl]
   (iii) /n/ ↔ [–2] /__ V*sein*
   (iv) /Ø/ ↔ [–pl] /__ V*sein*, [+1]
   (v) /t/ ↔ [±pl] /__ V*sein*

Remarks:

- The /__ notation is supposed to be neutral with respect to linear order.
- The necessity for contextual features arises because the system displays extended (multiple) exponence (Matthews (1972)), a fact already noted by Pike (1965)). Contextual features are not discharged by insertion in the case of fissioned heads.
- The availability of a natural class comprising first and second person (encoded by the feature [–3]) makes it possible to dispense with a special rule introducing zero marking for third person singular contexts.

Analysis: Vocabulary Insertion

(17) Subanalysis of the suppletive paradigm:

1.sg			
2.sg			
3.sg			
1.pl			
2.pl			
3.pl			

(18) Vocabulary insertion rules

Analysis: Vocabulary Insertion

(17) Subanalysis of the suppletive paradigm:

1.sg	b		
2.sg	b		
3.sg			
1.pl			
2.pl			
3.pl			

(18) Vocabulary insertion rules

V (i) /b/ ↔ V*sein* /__ [–3,–pl]

Analysis: Vocabulary Insertion

(17) Subanalysis of the suppletive paradigm:

1.sg	b		
2.sg	b		
3.sg			
1.pl	z		
2.pl	z		
3.pl	z		

(18) Vocabulary insertion rules

V (i) /b/ ↔ V*sein* /__ [–3,–pl]
(ii) /z/ ↔ V*sein* /__ [+pl]

Analysis: Vocabulary Insertion

(17) Subanalysis of the suppletive paradigm:

1.sg	b		
2.sg	b		
3.sg			
1.pl	z		
2.pl	z	a	
3.pl	z		

(18) Vocabulary insertion rules

V	(i)	/b/ $\leftrightarrow$ V*sein* /__ [–3,–pl]
	(ii)	/z/ $\leftrightarrow$ V*sein* /__ [+pl]
Th	(i)	/a/ $\leftrightarrow$ [+β] /__ V*sein*, [–1,+2,+pl]

- V*sein* is associated with a Th position bearing the abstract features [+α,+β] (Oltra Massuet (1999)).

Analysis: Vocabulary Insertion

(17) Subanalysis of the suppletive paradigm:

1.sg	b		ɪ	
2.sg	b		ɪ	
3.sg			ɪ	
1.pl	z		ɪ	
2.pl	z	a	ɪ	
3.pl	z		ɪ	

(18) Vocabulary insertion rules

V	(i)	/b/ ↔ V*sein* /__ [–3,–pl]
	(ii)	/z/ ↔ V*sein* /__ [+pl]
Th	(i)	/a/ ↔ [+β] /__ V*sein*, [–1,+2,+pl]
	(ii)	/ɪ/ ↔ [+α] /__ V*sein*

- V*sein* is associated with a Th position bearing the abstract features [+α,+β] (Oltra Massuet (1999)).
- [+β] outranks [+α], and the Strict Cycle Condition predicts the order of exponents.

Analysis: Vocabulary Insertion

(17) Subanalysis of the suppletive paradigm:

1.sg	b		ɪ	
2.sg	b		ɪ	
3.sg			ɪ	
1.pl	z		ɪ	
2.pl	z	a	ɪ	Ø
3.pl	z		ɪ	

(18) Vocabulary insertion rules

V	(i)	/b/ ↔ V*sein* /__ [–3,–pl]
	(ii)	/z/ ↔ V*sein* /__ [+pl]
Th	(i)	/a/ ↔ [+β] /__ V*sein*, [–1,+2,+pl]
	(ii)	/ɪ/ ↔ [+α] /__ V*sein*
Agr	(i)	/Ø/ ↔ [–1,+2] /__ V*sein*, [+pl]

- V*sein* is associated with a Th position bearing the abstract features [+α,+β] (Oltra Massuet (1999)).
- [+β] outranks [+α], and the Strict Cycle Condition predicts the order of exponents.
- Person features are more specific than number features, [±1] is more specific than [±2]; [–pl] and [+pl] are more specific than [±pl] (contextual features do not count for specificity).

Analysis: Vocabulary Insertion

(17) Subanalysis of the suppletive paradigm:

1.sg	b		ɪ	
2.sg	b		ɪ	s
3.sg			ɪ	s
1.pl	z		ɪ	
2.pl	z	a	ɪ	Ø
3.pl	z		ɪ	

(18) Vocabulary insertion rules

V	(i)	/b/ ↔ V*sein* /__ [–3,–pl]
	(ii)	/z/ ↔ V*sein* /__ [+pl]
Th	(i)	/a/ ↔ [+β] /__ V*sein*, [–1,+2,+pl]
	(ii)	/ɪ/ ↔ [+α] /__ V*sein*
Agr	(i)	/Ø/ ↔ [–1,+2] /__ V*sein*, [+pl]
	(ii)	/s/ ↔ [–1] /__ V*sein*, [–pl]

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Analysis: Vocabulary Insertion

(17) Subanalysis of the suppletive paradigm:

1.sg	b		ɪ	n
2.sg	b		ɪ	s
3.sg			ɪ	s
1.pl	z		ɪ	n
2.pl	z	a	ɪ	Ø
3.pl	z		ɪ	n

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V	(i)	/b/ ↔ V*sein* /__ [–3,–pl]
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Th	(i)	/a/ ↔ [+β] /__ V*sein*, [–1,+2,+pl]
	(ii)	/ɪ/ ↔ [+α] /__ V*sein*
Agr	(i)	/Ø/ ↔ [–1,+2] /__ V*sein*, [+pl]
	(ii)	/s/ ↔ [–1] /__ V*sein*, [–pl]
	(iii)	/n/ ↔ [–2] /__ V*sein*

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2.sg	b		ɪ	s	
3.sg			ɪ	s	
1.pl	z		ɪ	n	
2.pl	z	a	ɪ	Ø	
3.pl	z		ɪ	n	

(18) Vocabulary insertion rules

V	(i)	/b/ ↔ V*sein* /__ [–3,–pl]
	(ii)	/z/ ↔ V*sein* /__ [+pl]
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	(ii)	/ɪ/ ↔ [+α] /__ V*sein*
Agr	(i)	/Ø/ ↔ [–1,+2] /__ V*sein*, [+pl]
	(ii)	/s/ ↔ [–1] /__ V*sein*, [–pl]
	(iii)	/n/ ↔ [–2] /__ V*sein*
	(iv)	/Ø/ ↔ [–pl] /__ V*sein*, [+1]

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Analysis: Vocabulary Insertion

(17) Subanalysis of the suppletive paradigm:

1.sg	b		ɪ	n	Ø
2.sg	b		ɪ	s	t
3.sg			ɪ	s	t
1.pl	z		ɪ	n	t
2.pl	z	a	ɪ	Ø	t
3.pl	z		ɪ	n	t

(18) Vocabulary insertion rules

V	(i)	/b/ ↔ V*sein* /__ [–3,–pl]
	(ii)	/z/ ↔ V*sein* /__ [+pl]
Th	(i)	/a/ ↔ [+β] /__ V*sein*, [–1,+2,+pl]
	(ii)	/ɪ/ ↔ [+α] /__ V*sein*
Agr	(i)	/Ø/ ↔ [–1,+2] /__ V*sein*, [+pl]
	(ii)	/s/ ↔ [–1] /__ V*sein*, [–pl]
	(iii)	/n/ ↔ [–2] /__ V*sein*
	(iv)	/Ø/ ↔ [–pl] /__ V*sein*, [+1]
	(v)	/t/ ↔ [±pl] /__ V*sein*

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- Something extra must be said for infinitives: impoverishment.

Analysis: Vocabulary Insertion

(17) Subanalysis of the suppletive paradigm:

1.sg	b		ɪ	n	Ø
2.sg	b		ɪ	s	t
3.sg			ɪ	s	t
1.pl	z		ɪ	n	t
2.pl	z	a	ɪ	Ø	t
3.pl	z		ɪ	n	t
inf	z	a	ɪ	n	

(18) Vocabulary insertion rules

V	(i)	/b/ ↔ V*sein* /__ [–3,–pl]
	(ii)	/z/ ↔ V*sein* /__ [+pl]
Th	(i)	/a/ ↔ [+β] /__ V*sein*, [–1,+2,+pl]
	(ii)	/ɪ/ ↔ [+α] /__ V*sein*
Agr	(i)	/Ø/ ↔ [–1,+2] /__ V*sein*, [+pl]
	(ii)	/s/ ↔ [–1] /__ V*sein*, [–pl]
	(iii)	/n/ ↔ [–2] /__ V*sein*
	(iv)	/Ø/ ↔ [–pl] /__ V*sein*, [+1]
	(v)	/t/ ↔ [±pl] /__ V*sein*

- V*sein* is associated with a Th position bearing the abstract features [+α,+β] (Oltra Massuet (1999)).
- [+β] outranks [+α], and the Strict Cycle Condition predicts the order of exponents.
- Person features are more specific than number features, [±1] is more specific than [±2]; [–pl] and [+pl] are more specific than [±pl] (contextual features do not count for specificity).
- Something extra must be said for infinitives: impoverishment.
- Finally, the analysis needs to be generalized in the Agr domain to verb inflection in general (weak and strong conjugations).

Conclusion

- There are a priori 30 exponents (ignoring the infinitive); the analysis needs 9 rules for vocabulary insertion. Almost all of the instances of partial syncretism are derived systematically, and only zero exponence requires more than one rule.
- There may be a "reverse Indo-European bias" among scholars working on inflectional morphology in Indo-European languages; i.e., a reluctance to apply segmentation techniques that are well established for lesser-studied languages to the well-studied Indo-European languages.

Main point:

1. There is evidence that word forms in the suppletive conjugation in German are composed of smaller parts: partial syncretism.
2. However, the properties of the word forms can be determined on the basis of the properties of the individual vocabulary items: A rule-based approach is possible, and well motivated because it derives the cases of syncretism.
3. Conclusion: Word forms in the suppletive conjugation in German are not morphological constructions.

Binomials

Binomiale:
Binomials are complex idiomatic expressions consisting of two lexical items of the same category type that are connected by the conjunction und in German.

(19) a. Adjectival/adverbial binomials:
fix und fertig, kurz und gut, gut und gern, klipp und klar, ab und zu, ganz und gar, angst und bange

b. Nominal binomials:
Katz und Maus, Kind und Kegel, Haus und Hof, Soll und Haben, Knall und Fall, Tag und Nacht, Sack und Pack, Grund und Boden, Drum und Dran, Biegen und Brechen, Nacht und Nebel, Schloss und Riegel

c. Verbal binomials:
hegen und pflegen, schalten und walten, kommen und gehen, zittern und zagen, (sich) recken und strecken

References: Malkiel (1959), Burger (1973), Ross (1980), McDonald et al. (1993), Fleischer (1982), Müller (1997a), Lenz (1999), Wright et al. (2005),

Properties

(20) Properties of binomials:

a. Binomials show a tendency to be semantically opaque (like other idioms, they often require techniques like contextually restricted meaning assignments to permit a compositional interpretation)
b. Bionomials are formulaic (like all idioms)
c. Binomials are irreversible:
Change of word order leads to loss of idiom character (and ungrammaticality if no non-idiomatic semantic interpretation is available)

(21) a. klipp und klar
b. *klar und klipp
c. Sack und Pack
d. *Pack und Sack

Binomials as Constructions?

State of affairs:

- Binomials are evidently composed of smaller parts: individual words (of the same category), and coordinative und.
- Still, it looks like the property of irreversibility cannot be derived systematically.

Question:
Do we need have to assume that German binomials are syntactic constructions?

Answer:
Probably not. Closer inspection reveals that the linear order in binomials (old and new) can be predicted on the basis of independently motivated grammatical rules.
[Binomials are extremely productive in German, as they are in other languages.]

(22) Three kinds of grammatical rules:

a. salience rules
b. metrical rules
c. syllable concatenation rules

Salience Rules and Word Order in Binomials

(23) Salience rule schema:
If α is more salient than β, then α precedes β.

(24) Some instances of this general rule:

a. [+animate] precedes [–animate]:
Mensch und Maschine (*Maschine und Mensch)

b. [+human] precedes [–human]:
Mann und Maus (*Maus und Mann), Mensch und Tier (*Tier und Mensch)

c. [+proximate] precedes [–proximate]:
dies und das (*das und dies), hier und da (*da und hier), kommen und gehen (*gehen und kommen)

Salience Rule and Grammar

Observation: [+animate] precedes [–animate] determines word order in German clauses (Heck (2000), Fanselow (2001), Pappert et al. (2007)).

(25) a. dass der Arzt dem Patienten geholfen hat
that the doctor$_{nom}$ the patient$_{dat}$ helped has
b.??dass dem Patienten der Arzt geholfen hat
that the patient$_{dat}$ the doctor$_{nom}$ helped has
c. ?dass das Medikament dem Patienten geholfen hat
that the medicine$_{nom}$ the patient$_{dat}$ helped has
d. dass dem Patienten das Medikament geholfen hat
that the patient$_{dat}$ the medicine$_{nom}$ helped has

Assumption:

- The animacy rule is a trigger for scrambling to a specifier of vP.
- However, this trigger can be blocked by a more important rule that requires object shift of unstressed pronouns to the left edge of vP.

(26) Object shift blocks animacy-driven scrambling:

a. dass es ihm gefallen hat
that it him pleased has
b.?*dass ihm es gefallen hat
that him it pleased has

Metrical Rules

Observation:
From the perspective of metrical rules, German binomials are treated like monomorphemic words.

(27) Foot stress:
Metrical feet on the foot level are

a. bounded (alternating);
b. left-headed (trochaic); and
c. built from right to left.

(28) Word stress:
Metrical feet on the word level are

a. unbounded; and
b. right-headed.

Examples

(29) Disyllabic words:

(x	)	(x	)	(x	)
(x	.)	(x	.)	(x	.)
σ	σ	σ	σ	σ	σ
fer	tig	Pau	ken	wirk	lich

(30) Trisyllabic words:

(.	x	)	(.	x	)
(x)	(x	.)	(x)	(x.	.)
σ	σ	σ	σ	σ	σ
Trom	pe	ten	wahr	haf	tig

(31) Tetrasyllabic words:

(.		x	)	(.		x	)
(x	.)	(x.	.)	(x.	.)	(x	.)
σ	σ	σ	σ	σ	σ	σ	σ
An	ti	lo	pe	Pro	pa	gan	da

Note: Of course, there are various exceptions (trimoraic syllabes attract stress, extrametricality, lexical stress), but these are arguably the most basic rules (see, e.g., Féry (1995)).

Stress and Word Order in Binomials

(32) fix und fertig behaves like a tetrasyllabic word:

(.		x	)		(.			x)			
(x	.)	(x	.)		(x	.)	(.	x)			
σ	σ	σ	σ		σ	σ	σ	σ			
fix	und	fér	tig		*fer	tig	und	fíx			

(33) fix und fertig behaves almost like a trisyllabic word:

(.		x)			(.	x	)				
(x	.)	(x)			(x)	(x	.)				
σ	σ	σ			σ	σ	σ				
Drum	und	Drán			Drum	únd	Dran				

(34) Pauken und Trompeten behaves like a hexasyllabic word:

a (. . x)

a.	(x	.)	(x	.)	(x	.)					
	σ	σ	σ	σ	σ	σ					
	Pau	ken	und	Trom	pé	ten					
	(.	.		.	x	)					
b.	(x)	(x	.)	(x)	(x	.)					
	σ	σ	σ	σ	σ	σ					
	Trom	pe	ten	und	Páu	ken					

Syllable Concatenation Rules

These rules go back to Malkiel (1959) and Ross (1980).

(35) a. Onset Size:
If the onset of a syllable σ_1 is shorter than the onset of a syllable σ_2, σ_1 precedes σ_2.

b. Nucleus Size:
If the nucleus of a syllable σ_1 is shorter than the nucleus of a syllable σ_2, σ_1 precedes σ_2.

c. Nucleus Quality:
If the (first) vowel of a syllable σ_1 dominates the (first) vowel of the a syllable σ_2 on the vowel hierarchy, σ_1 precedes σ_2.
Vowel hierarchy:
High vowels dominate low vowels; in case of identical height, front vowels dominate back vowels. ([i] $\succ$ [u] $\succ$ [y] $\succ$ [e] $\succ$ [o] $\succ$ [ɛ] $\succ$ [a])

d. Onset Quality:
If the (first) consonant of a syllable σ_1 dominates the (first) consonsant of a syllable σ_2 on the sonority hierarchy, σ_1 precdes σ_2.
Sonority hierarchy for consonants:
[ʔ], [h] $\succ$ [j] $\succ$ [w], [r] $\succ$ [l], [m] $\succ$ [n] $\succ$ [ŋ] $\succ$ [v], [z], [ʒ] $\succ$ [f], [s], [ʃ], [x], [ç] $\succ$ [b], [d], [g] $\succ$ [p], [t], [k]

Syllable Concatenation and Word Order in Binomials

(36) a. Onset size:
(sich) [r]ecken und [str]ecken (*[str]ecken und recken), [r]ank und [schl]ank (*[schl]ank und [r]ank), [S]aus und [Br]aus (*[Br]aus und [S]aus), [S]aft und [Kr]aft (*[Kr]aft und [S]aft), [L]ug und [Tr]ug (*[Tr]ug und [L]ug), [w]eit und [br]eit (*[br]eit und [w]eit), [T]uten und [Bl]asen (*[Bl]asen und [T]uten), [B]iegen und [Br]echen (*[Br]echen und [B]iegen), [h]ieb- und [st]ich(-fest) (*[st]ich- und [h]ieb(-fest))

b. Nucleus size:
g[a]nz und [ga:r] (*g[a:]r und g[a]nz), k[u]rz und kl[ei]n (*kl[ei]n und k[u]rz), k[u]rz und g[u:]t (*g[u:]t und k[u]rz), fr[a]nk und fr[ei] (*fr[ei] und fr[a]nk), h[i]n und h[e:]r (*h[e:]r und h[i]n), kl[i]pp und kl[a:]r (*kl[a:]r und kl[i]pp), St[u]mpf und St[i:]l (*St[i:]l und St[u]mpf)

c. Nucleus quality:
Dr[u]m und Dr[a]n (*Dr[a]n und Dr[u]m), H[i]nz und K[u]nz (*K[u]nz und H[i]nz), v[o]ll und g[a]nz (*g[a]nz und v[o]ll), d[i]ck und d[ü]nn (*d[ü]nn und d[i]ck), d[i]ck und f[e]tt (*f[e]tt und d[i]ck)

d. Onset quality:
(mit) [S]ack und [P]ack (*[P]ack und [S]ack), [R]at und [T]at (*[T]at und [R]at), [ʔ]eh und [j]eh (*[j]eh und [ʔ]eh), [Schr]itt und [Tr]itt (*[Tr]itt und [Schr]itt), [H]andel und [W]andel (*[W]andel und [H]andel)

Syllable Concatenation Rules in Conflict

(37) a. Onset Size ≻ Nucleus Size:
Biegen und Brechen (*Brechen und Biegen), hieb- und stich(-fest), *stich- und hieb(-fest)

b. Nucleus Size ≻ Nucleus Quality:
Stumpf und Stiel (*Stiel und Stumpf)

c. Nucleus Quality ≻ Onset Quality:
dick und fett (*fett und dick)

Note:
Syllable concatenation rules are not construction-specific. They hold throughout, but often their effects are overriden by higher-ranked rules.

(38) Independent evidence for syllable prominence rules (Ross (1980), Wiese (1989)):
zickzack (*zackzick), tiptop (* toptip), Hokuspokus (*Pokushokus), ruckzuck (*zuckruck), halli-hallo (*hallo-halli), Mischmasch (*Maschmisch)

Assumptions about Coordination

(39) Two types of features that drive operations (Heck & Müller (2006); based on Adger (2003), Roberts & Roussou (2002), Sternefeld (2006)):

a. Structure-building features (edge features, subcategorization features) trigger (external or internal) Merge: [•F•]

b. Probe features trigger Agree: [∗F∗].

(40) Last Resort (LR):
Every syntactic operation must discharge either [•F•] or [∗F∗].

Assumptions:

- The coordinative item und subcategorizes for [•α•], where α is any category (und is not a vocabulary item that is inserted post-syntactically).
- When und merges with X, X duplicates its categorial feature as a subcategorization feature (in minimal violation of inclusiveness), and thereby becomes the head.
- The linguistic expression und X merges with Y (which has the same category label) and projects: Y und X.

Local Optimization

- Assumption: und, fix, fertig are in the numeration.

(41) Derivation$_1$

a. Merge (und:[•α•], fertig) → [$_{A'}$ und fertig]:[•A•].
b. Merge ([$_{A'}$ und fertig]:[•A•], fix) → [$_{AP}$ fix [$_{A'}$ und fertig]]

(42) Derivation$_2$

a. Merge (und:[•α•], fix) → [$_{A'}$ und fix]:[•A•].
b. Merge ([$_{A'}$ und fix]:[•A•], fertig) → *[$_{AP}$ fertig [$_{A'}$ und fix]]

Assumptions (Heck & Müller (2000, 2003)):

1. Every XP is a local optimization domain.
2. The order of rules is: salience ≻ stress ≻ syllable prominence.
3. Every phrase is subject to cyclic spell-out (including application of metrical rules).

- The two derivations compete (same XP input).
- D_1 and D_2 both satisfy salience (vacuously), but D_1 satisfies stress where D_2 does not.
- Hence, D_1 is chosen as the sole optimal candidate that can participate in subsequent derivational steps (that generate the whole sentence).

Non-Trivial Interaction of Rules

(43) Order of rules:
Salience $\succ$ stress $\succ$ syllable prominence.

Consequence:

- Stress is only relevant if both outputs behave identically with respect to salience.
- Syllable prominence is only relevant if both outputs behave identically with respect to salience and stress.

(44) Evidence for salience $\succ$ stress:
Wasser und Brot (*Brot und Wasser), Hopfen und Malz (*Malz und Hopfen), Vater und Sohn (*Sohn und Vater), Ebbe und Flut (*Flut und Ebbe), Leben und Tod (*Tod und Leben), Erde und Mond (*Mond und Erde)

(45) Evidence for salience $\succ$ syllable prominence:
Tag und Nacht (*Nacht und Tag), da und dort (*dort und da), dies und das (*das und dies), Bruder und Schwester (*Schwester und Bruder), rechts und links (*links und rechts), Brot und Käse (*Käse und Brot), Scotch und Soda (*Soda und Scotch), Buch und Umschlag (*Umschlag und Buch)

(46) Evidence for stress $\succ$ syllable prominence:
Grund und Boden (*Boden und Grund), Schloss und Riegel (*Riegel und Schloss), nie und nimmer (*nimmer und nie), samt und sonders (*sonders und samt), null und nichtig (*nichtig und null)

Idioms vs. Non-Idioms

For non-idiomatic expressions, both orders are possible. Why?

(47) Derivation$_1$

a. Merge (und:[•X•], grün) → [$_{A'}$ und grün]:[•A•].
b. Merge ([$_{A'}$ und grün]:[•A•], lila) → [$_{AP}$ lila [$_{A'}$ und grün]]

(48) Derivation$_2$

a. Merge (und:[•X•], lila) → [$_{A'}$ und lila]:[•A•].
b. Merge ([$_{A'}$ und lila]:[•A•], grün) → [$_{AP}$ grün [$_{A'}$ und lila]]

Hypothesis:

- The order in non-idiomatic expressions can be affected by (higher-ranked) discourse-related rules.
- The order in idiomatic expressions cannot be affected by (higher-ranked) discourse-related rules.

Conclusion

Main point:

1. There is evidence that binomials in German are composed of smaller parts: word status, productivity.
2. However, the properties of the binomials (in particular, their irreversibility) can be determined on the basis of the properties of the individual lexical items: A rule-based approach is possible, and well motivated because it derives the cases of irreversibility, which a construction-based approach cannot easily do.
3. Conclusion: Binomials in German are not syntactic constructions.

The Phenomenon

Observation (Frazer (1970), Nunberg, Sag & Wasow (1994), Jackendoff (1997), O'Grady (1998); Burger (1973), Fleischer (1982; 1997), Sailer (2003) on German):
Idioms resist transformations to various degrees.
Implicational generalization:
If an idiom α dominates an idiom β on the opacity hierarchy, and transformation δ can affect α, then δ can also affect β.

(49) a. Opacity hierarchy:
$XP_{opaque} > XP_{semi-opaque} > XP_{semi-transparent} > XP_{transparent}$
b. Integrity Hierarchy:
Intact $>$ affected

(50) A transformation affects an XP iff it applies to a proper subpart of XP. (Movement out of XP makes XP incomplete and thereby always affects it.)

Note:
The Opacity hierarchy encodes a taxonomy of idioms arrived at in the Soviet school of phraseology (Vinogradov (1946; 1947), Šanskij (1972), Černiševa (1970)).

(51) Soviet taxonomy of idioms:

a. Frazeologičeskije sraščenija ("Phraseologische Fügungen")
b. Frazeologičeskie edinstva ("Phraseologische Ganzheiten")
c. Frazeologičeskieočetanija ("Phraseologische Verbindungen")
d. Frazeologičeskie vyraženija ("Phraseologische Ausdrücke")

Idiom Classes

(52) Idiom classes in German:

a. Opaque VPs:
Fersengeld geben, Fraktur reden, Bauklötze staunen

b. Semi-opaque VPs:
den Stier bei den Hörnern packen, die Flinte ins Korn werfen, Feuer fangen, den Vogel abschießen, ins Gras beißen, den Löffel abgeben

c. Semi-transparent VPs:
einen Korb geben, goldene Brücken bauen, die Suppe versalzen, ins Handwerk pfuschen

d. Transparent VPs:
   (i) light verb constructions: zur Aufführung bringen, in Verbindung stehen, Prüfung unterziehen
   (ii) reanalysis constructions: Buch lesen (vs. zerstören), Film sehen (vs. widmen)

How are idiom classes determined if semantic interpretation of idioms is always compositional?
(i) number of separate contextually determined meanings
(ii) number of contextually determined expletives

Transformational Deficiency 1

(53) Verb-Second:

a. Fritz gab$_1$ gestern Fersengeld t_1
Fritz gave yesterday heel money

b. Sie packte$_1$ den Stier bei den Hörnern t_1
she seized the bull at the horns

c. Sie gab$_1$ ihm einen Korb t_1
she gave him a basket

d. Maria las$_1$ ein Buch t_1
Maria read a book

(54) Topicalization:

a(?) Fersengeld$_1$ hat der Fritz t_1 gegeben
heel money has ART Fritz given

b. Den Stier$_1$ hat sie t_1 bei den Hörnern gepackt
the bull has she at the horns seized

c. Einen Korb$_1$ hat sie ihm t_1 gegeben
a basket has she him given

d. Ein Buch$_1$ hat Maria t_1 gelesen
a book has Maria read

Transformational Deficiency 2

(55) Passive:

a. *daß Fersengeld$_1$ vom Fritz t_1 gegeben wurde
that heel money by ART Fritz given was

b. daß der Stier$_1$ von ihr t_1 bei den Hörnern gepackt wurde
that the bull by her at the horns seized was

c. daß ihm ein Korb$_1$ von ihr t_1 gegeben wurde
that him a basket by her given was

d. daß ein Buch$_1$ von Maria t_1 gelesen wurde
that a book by Maria read was

(56) Internal modification:

a. *daß Fritz geliehenes Fersengeld gegeben hat
that Fritz borrowed heel money given has

b. *daß sie den großen Stier bei den Hörnern gepackt hat
that she the big bull at the horns seized has

c. daß sie ihm einen ganz schönen Korb gegeben hat
that she him a quite nice basket given has

d. daß Maria ein neues Buch gelesen hat
that Maria a new book read has

Transformational Deficiency 3

(57) Wh-Movement:

a. *Was für ein Fersengeld$_1$ hat der Fritz t_1 gegeben ?
what for a heel money has ART Fritz given

b. *Was für einen Stier$_1$ hat sie t_1 bei den Hörnern gepackt ?
what for a bull has she at the horns seized

c(?)Was für einen Korb$_1$ hat sie ihm t_1 gegeben ?
what for a basket has she him given

d. Was für ein Buch$_1$ hat Maria t_1 gelesen ?
what for a book has Maria read

(58) Left dislocation:

a. *Fersengeld$_1$ das wollte der Fritz t_1 geben
heel money that wanted ART Fritz give

b. *Den Stier$_1$ den hat sie t_1 bei den Hörnern gepackt
the bull that has she at the horns seized

c. *Einen Korb$_1$ den hat sie ihm t_1 gegeben
a basket that has she him given

d. Ein Buch$_1$ das hat Maria t_1 gelesen
a book that has Maria read

Variation: "Our intuitions in this domain are ... robust and ... consistent across speakers" (Nunberg, Sag & Wasow (1994, 507)). "Idioms, more than most aspects of language, vary enormously from speaker to speaker. [...] What is important is that the general claims about idioms ... hold true for each speaker" (Frazer (1970, 23)).

VP Idioms as Constructions?

State of affairs:

- VP idioms are evidently composed of smaller parts: individual words, sometimes even open slots (der Hafer x sticht, x's Schäfchen ins Trockene bringen, in x's Fußstapfen treten, steht in x's Hand, mit x's Meinung nicht hinter dem Berg halten, es x geben).
- Still, it looks like the property of transformational deficiency cannot be derived systematically.

Question:
Do we need have to assume that German VP idioms are syntactic constructions?

Answer:
Probably not. The restrictions, and the implicational generalization underlying the data, follow from simple, non-construction-specific principles if minimalist grammars permit local optimization.

Harmonic Alignment

(59) Harmonic Alignment (Prince & Smolensky (1993, 136)):
Suppose given a binary dimension D_1 with a scale X > Y on its elements {X,Y}, and another dimension D_2 with a scale a > b > ... > z on its elements {a,b,...,z}. The harmonic alignment of D_1 and D_2 is the pair of Harmony scales H_X, H_Y:

a. H_X: X/a $\succ$ X/b $\succ$ ... $\succ$ X/z
b. H_Y: Y/z $\succ$ ... $\succ$ Y/b $\succ$ Y/a

The constraint alignment is the pair of constraint hierarchies C_X, C_Y:

a. C_X: *X/z $\gg$ ... $\gg$ *X/b $\gg$ *X/a
b. C_Y: *Y/a $\gg$ *Y/b $\gg$ ... $\gg$ *Y/z

(60) a. Opacity hierarchy:
$XP_{opaque} > XP_{semi-opaque} > XP_{semi-transparent} > XP_{transparent}$
b. Integrity Hierarchy:
Intact > affected

(61) Harmonic alignment:

a. $H_{in.}$: XP_{op}/in. $\succ$ XP_{s-op}/in. $\succ$ XP_{s-tr}/in. $\succ$ XP_{tr}/in.
b. $H_{aff.}$: XP_{tr}/aff. $\succ$ XP_{s-tr}/aff. $\succ$ XP_{s-op}/aff. $\succ$ XP_{op}/aff.

(62) Constraint alignment:

a. $C_{in.}$: *XP_{tr}/in. $\gg$ *XP_{s-tr}/in. $\gg$ *XP_{s-op}/in. $\gg$ *XP_{op}/in.
b. $C_{aff.}$: *XP_{op}/aff. $\gg$ *XP_{s-op}/aff. $\gg$ *XP_{s-tr}/aff. $\gg$ *XP_{tr}/aff.

Analysis

Proposal:
The generalization concerning transformational deficiency follows from the fact that constraints that trigger transformations are interspersed with the subconstraints of the $C_{aff.}$ hierarchy.

Analysis:
The features that trigger the respective transformations are interspersed with the subconstraints of $C_{aff.}$ that was created by harmonically aligning the Opacity hierarchy and the (binary) Integrity Hierarchy.

(63) Ranking in German:

[•fin•], [•top•] $\succ$	$*XP_{op}$/aff. $\succ$
[•pass•] $\succ$	$*XP_{s-op}$/aff. $\succ$
[•wh•], [•mod•] $\succ$	$*XP_{s-tr}$/aff. $\succ$
[•ld•] $\succ$	$*XP_{tr}$/aff.

- In cases where discharge of a [•fin•] would have to violate a harmonic alignment constraint demanding that an XP is not affected by a transformation, it can be assumed that the empty output is the optimal candidate; the derivation then breaks down.

Conclusion

Harmonic alignment captures implications: If a given item α on a scale Σ has property δ, then any item β that is lower on Σ than α also has δ.

(64) Dividing lines across idioms:

a. Verb-second, topicalization: all
b. Passive: opaque vs. semi-opaque, semi-transparent, transparent
c. Wh-Movement: opaque, semi-opaque vs. semi-transparent, transparent
d. Left dislocation: opaque, semi-opaque, semi-transparent vs. transparent

Main point:

1. There is evidence that VP idioms in German are composed of smaller parts: word status, exceptions to transformational deficiency.
2. However, the properties of the VP idioms (in particular, their transformational deficiency) can be determined on the basis of the properties of the individual lexical items: A rule-based approach is possible, and well motivated because it derives the implicational generalization that if an idiom α dominates an idiom β on the opacity hierarchy, and transformation δ can affect α, then δ can also affect β
3. Conclusion: VP idioms in German are not syntactic constructions.

Data

Observation (Waßner (2001)):
There are restrictions on the shape of phase (CP) edges in adjacent CPs with idiomatic connectives in poetic use.

(65) Variations on a line in Goethe's "Der Fischer":

a. $[_{\mathrm{CP}_2}$ Halb$_i$ zog sie ihn t$_i$ $]$ $\hookrightarrow$ $[_{\mathrm{CP}_1}$ halb$_i$ sank er t$_i$ hin $]$
half pulled she him half sank he down

b. $[_{\mathrm{CP}_2}$ Sie zog ihn halb$_i$ $]$ $\hookrightarrow$ $[_{\mathrm{CP}_1}$ er sank halb$_i$ hin $]$
she pulled him half he sank half down

c. $[_{\mathrm{CP}_2}$ Sie zog ihn halb$_i$ $]$ $\hookrightarrow$ $[_{\mathrm{CP}_1}$ halb$_i$ sank er t$_i$ hin $]$
she pulled him half half sank he down

d. *$[_{\mathrm{CP}_2}$ Halb$_i$ zog sie ihn t$_i$ $]$ $\hookrightarrow$ $[_{\mathrm{CP}_1}$ er sank halb$_i$ hin $]$
half pulled she him he sank half down

Note:
The phenomenon is more general. It is not a simple parallelism effect (given the (c)-examples).

More Data

(66) More parallel CPs:

a. $[_{\mathrm{CP}_2}$ Bald$_i$ bin ich t$_i$ hier] $\hookrightarrow$ $[_{\mathrm{CP}_1}$ bald$_i$ bin ich t$_i$ dort]
soon am I here soon am I there

b. $[_{\mathrm{CP}_2}$ Ich bin bald hier] $\hookrightarrow$ $[_{\mathrm{CP}_1}$ ich bin bald dort]
I am soon here I am soon there

c. $[_{\mathrm{CP}_2}$ Ich bin bald hier] $\hookrightarrow$ $[_{\mathrm{CP}_1}$ bald$_i$ bin ich t$_i$ dort]
I am soon here soon am I there

d. *$[_{\mathrm{CP}_2}$ Bald$_i$ bin ich t$_i$ hier] $\hookrightarrow$ $[_{\mathrm{CP}_1}$ ich bin bald$_i$ dort]
soon am I here I am soon there

Generalization:
If CP_1 and CP_2 are parallel, the edge of CP_1 must be affected by non-subject topicalization if the edge of CP_2 is affected by non-subject topicalization (but not vice versa).

Basic Assumptions

The basic rule:
Williams (1999), Williams (2003) argues for a rule called Shape Conservation. Versions of this rule are adopted within an optimality-theoretic approach in Müller (1997b), Müller (2001) (for co-argument NPs) and in Müller (2000) (for vPs).
Claim:
Shape Conservation with CP (phase) edges accounts for the restriction on non-subject topicalization in parallel CPs in German.

(67) SCP (Shape Conservation for Phase Edges):
Phase edges have an identical shape throughout the derivation.

(68) Edge (Chomsky (2000), Chomsky (2001)):
The edge of an XP contains SpecX and X.

Computation of SCP violations:
Given the edge of CP_α, SCP violations for CP_β are computed as follows:
(i) Compare the n-th edge constituent of CP_α with the n-th edge constituent of CP_β and assign a * if the two items do not have an identical shape (relevant: categorial and movement-related features).
(ii) For each edge constituent of one CP that does not correspond to an edge constituent of the other CP, assign a *.

Features and Movment

Topicalization and V/2:
Topicalization in German is triggered by features on C; so is V/2 movement in German (see Grewendorf (2002) and references given there).

(69) Features of declarative C in German:

a. $C_d = [_C$ dass $]$
C_d does not trigger movement.

b. $C_e = [_C \emptyset_{[*EPP*],[*fin*]}]$
C_e triggers V/2 movement of the finite verb and movement of some XP to SpecC; given the MLC, this will then normally be the subject.

c. $C_t = [_C \emptyset_{[*EPP*],[*top*],[*fin*]}]$
C_t triggers V/2 movement of the finite verb and movement of some [top]-marked XP.

(70) MLC (Minimal Link Condition):
Movement to an XP position applies to the closest XP.

Assumption:
With two parallel CPs as in (65) and (66), CP_2 is optimized before CP_1, and generation and optimization of CP_1 takes place on the basis of CP_2, whose properties are still accessible. (Parallelism implies pseudo-subordination.)
Note:
In an account of the data in, e.g., (65), two options must be considered for each C. First, C can be C_e or C_t in CP_2. Second, C can be C_e or C_t in CP_1.

CP_2 is Subject-Initial

First option: C of CP_2 is C_e.

T_1: Parallelism: Subject-initial CP_2

Input: $[_{C_e}\ \emptyset_{[*EPP*],[*fin*]}]$, $[_{TP}$ sie ihn halb $zog_{[fin]}\ ]\ ]$	FC	SCP	MLC	LR
O_1: $[_{CP_2}\ [_{C_e}\ \emptyset\ ]\ [_{TP}$ sie ihn halb zog $]\ ]$	*!*			
O_2: $[_{CP_2}$ sie$_i$ $[_{C_e}\ \emptyset\ ]\ [_{TP}$ t$_i$ ihn halb zog$_j\ ]\ ]$	*!			
→ O_3: $[_{CP_2}$ sie$_i$ $[_{C_e}$ zog$_j$-$\emptyset\ ]\ [_{TP}$ t$_i$ ihn halb t$_j\ ]\ ]$				
O_4: $[_{CP_2}$ halb$_k$ $[_{C_e}\ \emptyset\ ]\ [_{TP}$ sie ihn t$_k$ zog $]\ ]$	*!		*	
O_5: $[_{CP_2}$ halb$_k$ $[_{C_e}$ zog$_j$-$\emptyset\ ]\ [_{TP}$ sie ihn t$_k$ t$_j\ ]\ ]$			*!	

Note:
Based on the optimal output O_3 in T_1, there are two possible continuations: CP_1 may have C_e, as in T_2, or C_t, as in T_3.

T_2: Parallelism: Subject-initial $CP_2 \hookrightarrow$ subject-initial CP_1

Input: $[_{CP_2}$ sie$_i$ $[_{C_e}$ zog$_j$-$\emptyset\ ]\ [_{TP}$ t$_i$ ihn halb t$_j\ ]\ ] \hookrightarrow$ $[_{TP}$ er halb hin $sank_{[fin]}\ ]$, $[_{C_e}\ \emptyset_{[*EPP*],[*fin*]}]$	FC	SCP	MLC	LR
O_{31}: $CP_2 \hookrightarrow [_{CP_1}\ [_{C_e}\ \emptyset\ ]\ [_{TP}$ er halb hin sank $]]$	*!*	**		
O_{32}: $CP_2 \hookrightarrow [_{CP_1}$ er$_i$ $[_{C_e}\ \emptyset\ ]\ [_{TP}$ t$_i$ halb hin sank $]]$	*!	*		
→ O_{33}: $CP_2 \hookrightarrow [_{CP_1}$ er$_i$ $[_{C_e}$ sank$_j$-$\emptyset\ ]\ [_{TP}$ t$_i$ halb hin t$_j\ ]]$				
O_{34}: $CP_2 \hookrightarrow [_{CP_1}$ halb$_k$ $[_{C_e}\ \emptyset\ ]\ [_{TP}$ er t$_k$ hin sank $]]$	*!	*	*	
O_{35}: $CP_2 \hookrightarrow [_{CP_1}$ halb$_k$ $[_{C_e}$ sank$_j$-$\emptyset\ ]\ [_{TP}$ er t$_k$ hin t$_j\ ]]$		*!	*	

CP_2 is Subject-Initial cont'd

T_3: Parallelism: Subject-initial $CP_2 \hookrightarrow$ connective-initial CP_1

Input: $[_{CP_2}$ sie$_i$ $[_{C_e}$ zog$_j$-Ø] $[_{TP}$ t$_i$ ihn halb t$_j$]] $\hookrightarrow$ $[_{TP}$ er halb$_{[top]}$ hin sank$_{[fin]}$], $[_{C_t}$ Ø$_{[*EPP*],[*top*],[*fin*]}$]	FC	SCP	MLC	LR
O_{31}: $CP_2 \hookrightarrow [_{CP_1}$ $[_{C_t}$ Ø] $[_{TP}$ er halb hin sank]]	*!**	**		
O_{32}: $CP_2 \hookrightarrow [_{CP_1}$ er$_i$ $[_{C_t}$ Ø] $[_{TP}$ t$_i$ halb hin sank]]	*!*	*		
O_{33}: $CP_2 \hookrightarrow [_{CP_1}$ er$_i$ $[_{C_t}$ sank$_j$-Ø] $[_{TP}$ t$_i$ halb hin t$_j$]]	*!			
O_{34}: $CP_2 \hookrightarrow [_{CP_1}$ halb$_k$ $[_{C_t}$ Ø] $[_{TP}$ er t$_k$ hin sank]]	*!	*	*	
→ O_{35}: $CP_2 \hookrightarrow [_{CP_1}$ halb$_k$ $[_{C_t}$ sank$_j$-Ø] $[_{TP}$ er t$_k$ hin t$_j$]]		*	*	

Conclusion:
(71-ab) are both optimal outputs.

(71) Subject-initial CP_2:

a. $[_{CP_2}$ Sie zog ihn halb$_i$] $\hookrightarrow$ $[_{CP_1}$ er sank halb$_i$ hin]
she pulled him half he sank half down

b. $[_{CP_2}$ Sie zog ihn halb$_i$] $\hookrightarrow$ $[_{CP_1}$ halb$_i$ sank er t$_i$ hin]
she pulled him half half sank he down

CP_2 is Connective-Initial

Second option:
C of CP_2 is C_t.

T_4: Parallelism: Connective-initial CP_2

Input: $[_{C_t}$ Ø$_{[*EPP*],[*top*],[*fin*]}]$, $[_{TP}$ sie ihn halb$_{[top]}$ zog$_{[fin]}$]]	FC	SCP	MLC	LR
O_1: $[_{CP_2}$ $[_{C_t}$ Ø] $[_{TP}$ sie ihn halb zog]]	*!**			
O_2: $[_{CP_2}$ sie$_i$ $[_{C_t}$ Ø] $[_{TP}$ t$_i$ ihn halb zog$_j$]]	*!*			
O_3: $[_{CP_2}$ sie$_i$ $[_{C_t}$ zog$_j$-Ø] $[_{TP}$ t$_i$ ihn halb t$_j$]]	*!			
O_4: $[_{CP_2}$ halb$_k$ $[_{C_t}$ Ø] $[_{TP}$ sie ihn t$_k$ zog]]	*!		*	
→ O_5: $[_{CP_2}$ halb$_k$ $[_{C_t}$ zog$_j$-Ø] $[_{TP}$ sie ihn t$_k$ t$_j$]]			*	

CP_2 is Connective-Initial 2

Note:
Based on the optimal output O_5 in T_4, there are two possible continuations: CP_1 may have C_t, as in T_5, or C_e, as in T_6.

T_5: Parallelism: Connective-initial $CP_2 \hookrightarrow$ connective-initial CP_1

Input: $[_{\mathrm{CP}_2}$ halb$_k$ $[_{\mathrm{C_t}}$ zog$_j$-Ø] $[_{\mathrm{TP}}$ sie ihn t$_k$ t$_j$]] $\hookrightarrow$ $[_{\mathrm{TP}}$ er halb$_{[top]}$ hin sank$_{[\mathrm{fin}]}$], $[_{\mathrm{C_t}}$ Ø$_{[*\mathrm{EPP}*],[*\mathrm{top}*],[*\mathrm{fin}*]}$]	FC	SCP	MLC	LR
O_{51}: $CP_2 \hookrightarrow [_{\mathrm{CP}_1}$ $[_{\mathrm{C_t}}$ Ø] $[_{\mathrm{TP}}$ er halb hin sank]]	*!**	**		
O_{52}: $CP_2 \hookrightarrow [_{\mathrm{CP}_1}$ er$_i$ $[_{\mathrm{C_t}}$ Ø] $[_{\mathrm{TP}}$ t$_i$ halb hin sank]]	*!*	**		
O_{53}: $CP_2 \hookrightarrow [_{\mathrm{CP}_1}$ er$_i$ $[_{\mathrm{C_t}}$ sank$_j$-Ø] $[_{\mathrm{TP}}$ t$_i$ halb hin t$_j$]]	*!	*		
O_{54}: $CP_2 \hookrightarrow [_{\mathrm{CP}_1}$ halb$_k$ $[_{\mathrm{C_t}}$ Ø] $[_{\mathrm{TP}}$ er t$_k$ hin sank]]	*!	*	*	
→ O_{55}: $CP_2 \hookrightarrow [_{\mathrm{CP}_1}$ halb$_k$ $[_{\mathrm{C_t}}$ sank$_j$-Ø] $[_{\mathrm{TP}}$ er t$_k$ hin t$_j$]]			*	

CP_2 is Connective-Initial 3

T_6: Parallelism: *Connective-initial $CP_2 \hookrightarrow$ subject-initial CP_1

Input: $[_{CP_2}$ halb$_k$ $[_{C_t}$ zog$_j$-Ø] $[_{TP}$ sie ihn t$_k$ t$_j$]] $\hookrightarrow$ $[_{TP}$ er halb hin sank$_{[fin]}$], $[_{C_e}$ Ø$_{[*EPP*],[*fin*]}$]	FC	SCP	MLC	LR
O_{51}: $CP_2 \hookrightarrow [_{CP_1}$ $[_{C_e}$ Ø] $[_{TP}$ er halb hin sank]]	*!*	**		
O_{52}: $CP_2 \hookrightarrow [_{CP_1}$ er$_i$ $[_{C_e}$ Ø] $[_{TP}$ t$_i$ halb hin sank]]	*!	**		
O_{53}: $CP_2 \hookrightarrow [_{CP_1}$ er$_i$ $[_{C_e}$ sank$_j$-Ø] $[_{TP}$ t$_i$ halb hin t$_j$]]		*!		
O_{54}: $CP_2 \hookrightarrow [_{CP_1}$ halb$_k$ $[_{C_e}$ Ø] $[_{TP}$ er t$_k$ hin sank]]	*!	*	*	
→ O_{55}: $CP_2 \hookrightarrow [_{CP_1}$ halb$_k$ $[_{C_e}$ sank$_j$-Ø] $[_{TP}$ er t$_k$ hin t$_j$]]			*	*

CP_2 is Connective-Initial 4

Conclusion:
(72-a) is an optimal output, (72-b) is not: SCP triggers input neutralization by forcing movement which is not feature-driven.

(72) Connective-initial CP_2:

a. $[_{CP_2}$ Halb$_i$ zog sie ihn t$_i$ $] \hookrightarrow [_{CP_1}$ halb$_i$ sank er t$_i$ hin $]$
half pulled she him half sank he down

b. *$[_{CP_2}$ Halb$_i$ zog sie ihn t$_i$ $] \hookrightarrow [_{CP_1}$ er sank halb$_i$ hin $]$
half pulled she him he sank half down

In general:
SCP can be violated so as to fulfill FR, but not in order to respect LR.
Note:
This analysis does not rely on construction-specific assumptions. In fact, the very same system can be shown to underlie the phenomenon of successive-cyclic movement (Müller (2003)).

Conclusion

Main point:

1. There is evidence that parallel CPs in German are composed of smaller parts: complete internal transparency.
2. However, the properties of the parallel CPs (the fact that they are formulaic, and, in particular, the absence of the fourth pattern) can be determined on the basis of the properties of the individual lexical items: A rule-based approach is possible, and well motivated because it derives the absence of the fourth pattern (in contrast to construction-based approaches).
3. Conclusion: Parallel CPs in German are not syntactic constructions.

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