

Theorien der Morphologie 3

Modul 006-1006: Grammatiktheorie, SoSe 2019

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Distributed Morphology II

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Fission and Impoverishment

Refs.: Frampton (2002)

1. Basic Assumptions

Central claims:

(i) Person features as they are standardly assumed (1, 2, 3) for verbal conjugations must be decomposed into combinations of more primitive features $[\pm 1]$, $[\pm 2]$. Vocabulary items can be underspecified with respect to these features. This captures instances of person syncretism.

(ii) The analysis requires post-syntactic operations: impoverishment and fission. As far as it can count as successful, it therefore provides an argument for Distributed Morphology.

(1) *Impoverishment:*

Impoverishment rules reduce morpho-syntactic feature bundles on the way from syntax to morphology; morphology then operates on simplified, “impoverished” structures, and we get a *retreat to the general case*.

Remark:

The concept of impoverishment employed here is the standard one. In contrast, fission is defined as in Halle & Marantz (1993) (*fission_a*), but rather as in Noyer (1992) (also see Trommer (1999a;b)).

(2) *Fission_a* (Halle & Marantz (1993)):

- Fission separates a feature bundle β from a terminal node (morpheme) M_α , such that two terminal nodes M_1 and M_2 come into existence.
- M_1 has the features β ; M_2 has the features of $M_{\alpha-\beta}$.

(3) *Fission_b* (Noyer (1992)): 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 $\alpha-\beta$, such that (a) and (b) hold:

- $\alpha-\beta$ is available for further vocabulary insertion.
- β is not available for further vocabulary insertion.

Note:

Fission of a morpheme is recursive; i.e., after insertion of a vocabulary item, a morpheme (assuming that it has morpho-syntactic features left) is again subject to fission, and so on (until no features are left).

(4) *Subset Principle* (Halle (1997)):

A vocabulary item V is inserted into a functional morpheme M iff (i) and (ii) hold:

(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).

Terminological remark:

Frampton calls this principle the “Principle of Decreasing Specificity” (PDS).

(5) *Specificity of vocabulary items:*

A vocabulary item V_i is more specific than a vocabulary item V_j iff V_i has more morpho-syntactic features than V_j .

2. Syncretism in English Verb Inflection

(6) a. *be*

	pres	past
1 sg	am	was
2 sg	are	were
3 sg	is	was
1 pl	are	were
2 pl	are	were
3 pl	are	were

b. *work*

	pres	past
1 sg	work	worked
2 sg	work	worked
3 sg	works	worked
1 pl	work	worked
2 pl	work	worked
3 pl	work	worked

(7) *Generalizations:*

- In past tense contexts, there is a syncretism of 1.Pers.Sg. and 3.Pers.Sg.
- In the plural, there are no person distinctions.

Assumption:

These two generalizations are not accidental. Therefore, they should not follow from arbitrary properties of vocabulary items. Rather, they should be derived from impoverishment rules that systematically reduce and simplify syntactic features structures for the purposes of morphological realization. Consequently, certain kinds of syncretism can be classified as system-defining properties.

Observation:

At least the 1./3. syncretism is a fundamental property of all Germanic languages. (It holds in Gothic, German, Icelandic, etc.)

Basic problem:

How can the 1./3. syncretism be derived by invoking the concept of natural classes of persons?

Plank (1991, 19):

This shows that syncretism can show up without any “similarity in meaning”; the reason would be that 1. and 3.Pers. intuitively do not form a natural class (“no natural class on any plausible criterion”).

Assumption (Wiese (1994)):

1. and 3.Pers. are indeed a natural class (that can then be referred to by inflection markers

via underspecification); the only thing that needs to be done is to decompose inflection markers accordingly.

(8) *Decomposition of inflection markers in Wiese's work:*

- a. [\pm demonstrative]
- b. [\pm addressing]

(9) *Persons in Wiese's system:*

- a. [-d,-a] = 1. Pers.
- b. [+d,+a] = 2. Pers.
- c. [+d,-a] = 3. Pers.
- d. [-d,+a] = - (1. Pers. incl.?)

Result:

1. and 3. Person form a natural class: [-addressing]

Note:

Independently, Frampton suggests a similar decomposition (based on work by Noyer (1992)).

(10) *Decomposition of person features in Frampton's analysis:*

- a. [\pm 1]
- b. [\pm 2]

Consequently:

- (i) [+a] in Wiese's system = [+2]
- (ii) [-a] in Wiese's system = [-2] in Frampton's system
- (iii) [+d] in Wiese's system = [-1] in Frampton's system
- (iv) [-d] in Wiese's system = [+1] in Frampton's system

Result:

Again, 1.Person and 3.Person form a natural class: [-2].

(11) *Persons in Frampton's system:*

- a. [+1,-2] = 1. Pers.
- b. [-1,+2] = 2. Pers.
- c. [-1,-2] = 3. Pers.
- d. [+1,+2] = 1. Pers. inkl.

Note:

In Frampton's analysis, the primitive features are given semantic interpretations; whether [+1,+2] can be interpreted in a coherent way is assumed to be subject to language-specific parametrization. In (e.g.) Indo-European languages, the combination is not available, due to a lack of semantic coherence.

Side remark:

The system of decomposed person features is not yet adequate to account for all cases of person syncretism that have been observed in the literature (for concreteness, there is good evidence that 1. and 2.Person also form a natural class). We can ignore this complication for the time being.

(12) *Vocabulary items: 'be':*

- a. /am/ \leftrightarrow [+1,-2,-pl,-past]
- b. /I/ \leftrightarrow [-2,-pl,-past]
- c. /are/ \leftrightarrow [-past]
- d. /was/ \leftrightarrow [-2,-pl,+past]
- e. /were/ \leftrightarrow [+past]

Problem:

The syncretism is now derivable by decomposing person features, but it is analyzed as going back to an arbitrary lexical entry (cf. (12-d)) rather than as a system-wide generalization.

Assumptions about syntactic structure

(13) a. *Simplified clause structure before head movement:*

[_{AgRP} [_{AgP} AgP [_{TP} [_{T'} T [_{VP} ... V ...]]]]]

b. *Result of head movement:*

[_{AgP} [_T V T] AgP]

Note:

This generates the abstract paradigms in (14). (These abstract paradigms are not to be viewed as genuine objects of the grammar; they have the status of generalizations about which fully specified categories need to be filled by vocabulary insertion. In line with virtually all work carried out in Distributed Morphology, Frampton assumes that paradigms are not entities that morphological constraints can refer to.)

(14) *Specifications that need to be realized by vocabulary items, version 1:*

a. V + [-past] +

[+1,-2,-pl]	[+1,-2,+pl]
[-1,+2,-pl]	[+1,+2,+pl]
[-1,-2,-pl]	[-1,-2,+pl]

b. V + [+past] +

[+1,-2,-pl]	[+1,-2,+pl]
[-1,+2,-pl]	[+1,+2,+pl]
[-1,-2,-pl]	[-1,-2,+pl]

Assumption:

(14) is simplified by impoverishment.

(15) *Impoverishment for plural contexts in English:*

[\pm 1, \pm 2] \rightarrow \emptyset /__ [+pl]

(16) *Specifications that need to be realized by vocabulary items, version 2 (after impoverishment):*

a. V + [-past] +

[+1,-2,-pl]	[+pl]
[-1,+2,-pl]	[+pl]
[-1,-2,-pl]	[+pl]

b. V + [+past] +

[+1,-2,-pl]	[+pl]
[-1,+2,-pl]	[+pl]
[-1,-2,-pl]	[+pl]

Consequence:

There can be no vocabulary items that are sensitive to person differences in the plural (or if there are, they will never be able to surface).

3. Syncretism in Old English Verb Inflection

(17) Weak verbs: *dēmen* ('deem')

	pres	past
[+1,-2,-pl]	dēm-e	dēm-d-e
[-1,+2,-pl]	dēm-est	dēm-d-est
[-1,-2,-pl]	dēm-eþ	dēm-d-e
[+1,-2,+pl]	dēm-aþ	dēm-d-on
[-1,+2,+pl]	dēm-aþ	dēm-d-on
[-1,-2,+pl]	dēm-aþ	dēm-d-on

(18) Strong verbs: *singan* ('sing')

	pres	past
[+1,-2,-pl]	sing-e	sang
[-1,+2,-pl]	sing-est	sung-e
[-1,-2,-pl]	sing-eþ	sang
[+1,-2,+pl]	sing-aþ	sung-on
[-1,+2,+pl]	sing-aþ	sung-on
[-1,-2,+pl]	sing-aþ	sung-on

(19) Suppletive verbs: *sindon* ('be')

	pres	past
[+1,-2,-pl]	eam	wæs
[-1,+2,-pl]	eart	wær-e
[-1,-2,-pl]	is	wæs
[+1,-2,+pl]	sindon	wær-on
[-1,+2,+pl]	sindon	wær-on
[-1,-2,+pl]	sindon	wær-on

Assumption:

The instances of systematic syncretism in the plural, and with 1. and 3. Pers. Sg. in past tense contexts, are to be derived by involving impoverishment rules.

(20) *Impoverishment:*

- [+past] becomes a privative feature [past], [-past] is deleted.
- [+pl] becomes a privative feature [pl], [-pl] is deleted.
- [±1] → ∅/[past]__.
- [±1,±2] → ∅/__[pl].

Note:

(20-cd) are the important rules.

(It is not fully clear to me whether (20-ab) are needed at all. Frampton introduces these rules as 'privativization rules', but it seems that we are dealing with impoverishment rules here.)

Consequence:

From (14), we don't just get (16); rather, we get the abstract paradigm (21). (21) exhaustively defines the possible insertion contexts for Old English verb inflection markers.

(21) *Specifications that need to be realized by vocabulary items, version 3 (after privatization and two applications of impoverishment):*

- V + $\begin{bmatrix} [+1,-2] & [pl] \\ [-1,+2] & [pl] \\ [-1,-2] & [pl] \end{bmatrix}$
- V + [past] + $\begin{bmatrix} [-2] & [pl] \\ [+2] & [pl] \\ [-2] & [pl] \end{bmatrix}$

(22) *Vocabulary items:*

- /wæs/ ↔ *sindon*/__[-2,past]
- /wær/ ↔ *sindon*/__[past]
- ∅ ↔ [past]/V_{strong}__
- /d/ ↔ [past]
- ∅ ↔ [-2]/V_{strong},[past]__
- /e/ ↔ [+2]/V_{strong},[past]__
- /eþ/ ↔ [-1,-2]
- /est/ ↔ [+2]
- /e/ ↔ [-2]
- /on/ ↔ [pl]/[past]__
- /aþ/ ↔ [pl]

- V + $\begin{bmatrix} [+1,-2] & [pl] \\ [-1,+2] & [pl] \\ [-1,-2] & [pl] \end{bmatrix}$
- V + [past] + $\begin{bmatrix} [-2] & [pl] \\ [+2] & [pl] \\ [-2] & [pl] \end{bmatrix}$

Problem:

Why are no inflection markers inserted with suppletive forms of *sindon* in the present tense?

Solution:

sindon (= V) and Agr fuse when they are adjacent (i.e., if T[past] does not intervene).

- /eam/ ↔ *sindon*,[+1,-2]
- /eart/ ↔ *sindon*,[+2]
- /is/ ↔ *sindon*,[-2]
- /sindon/ ↔ *sindon*,[pl]

Complexity:

Frampton notes that, given the Subset Principle, (a) first the vocabulary items have to be determined that fit into a given context, and (b) then the most specific marker (among those that are compatible) must be determined. Assuming impoverishment, both processes are substantially shorter. Therefore (so the idea), a theory that employs impoverishment is attractive, and preferable, from the point of view of complexity (other things being equal).

4. Syncretism in German Verb Inflection

(25) Weak verbs: *believe*

	pres	past
[+1,-2,-pl]	glaub-e	glaub-te
[-1,+2,-pl]	glaub-st	glaub-te-st
[-1,-2,-pl]	glaub-t	glaub-te
[+1,-2,+pl]	glaub-en	glaub-te-n
[-1,+2,+pl]	glaub-t	glaub-te-t
[-1,-2,+pl]	glaub-en	glaub-te-n

(26) Strong verbs: *sing*

	pres	past
[+1,-2,-pl]	sing-e	sang
[-1,+2,-pl]	sing-st	sang-st
[-1,-2,-pl]	sing-t	sang
[+1,-2,+pl]	sing-en	sang-en
[-1,+2,+pl]	sing-t	sang-t
[-1,-2,+pl]	sing-en	sang-en

(27) Suppletive verbs: *be*

	pres	past
[+1,-2,-pl]	bin	war
[-1,+2,-pl]	bi-st	war-st
[-1,-2,-pl]	is-t	war
[+1,-2,+pl]	sind	war-en
[-1,+2,+pl]	seid	war-t
[-1,-2,+pl]	sind	war-en

(28) Impoverishment rules, German:

- [+past] becomes a privative feature [past], [-past] is deleted.
- [+pl] becomes a privative feature feature [pl], [-pl] is deleted.
- [±1] → ∅/[past]__.
- [±1] → ∅/__[pl].

(29) Specifications that need to be realized by vocabulary items (after privatization and two applications of impoverishment):

$$\text{a. } V + \begin{array}{|c|c|} \hline [+1,-2] & [-2,pl] \\ \hline [-1,+2] & [+2,pl] \\ \hline [-1,-2] & [-2,pl] \\ \hline \end{array}$$

$$\text{b. } V + [\text{past}] + \begin{array}{|c|c|} \hline [-2] & [-2,pl] \\ \hline [+2] & [+2,pl] \\ \hline [-2] & [-2,pl] \\ \hline \end{array}$$

(30) Vocabulary items:

- ∅ ↔ [past]/V_{strong}__
- /te/ ↔ [past]
- /e/ ↔ [+1,-2]

$$\text{d. } /t/ \leftrightarrow [-1,-2]$$

$$\text{e. } /n/ \leftrightarrow [-2,pl]$$

$$\text{f. } /t/ \leftrightarrow [+2,pl]$$

$$\text{g. } /st/ \leftrightarrow [+2]$$

$$(31) \text{ a. } V + \begin{array}{|c|c|} \hline [+1,-2] & [-2,pl] \\ \hline [-1,+2] & [+2,pl] \\ \hline [-1,-2] & [-2,pl] \\ \hline \end{array} \quad \text{b. } V + [\text{past}] + \begin{array}{|c|c|} \hline [-2] & [-2,pl] \\ \hline [+2] & [+2,pl] \\ \hline [-2] & [-2,pl] \\ \hline \end{array}$$

5. Kabyle-Berber

Language: Afro-Asiatic, Algeria

Plot:

There is no evidence for impoverishment here in the domain of conjugation, but there is evidence for (i) the decomposition of person features, and (ii) fission.

(32) *Fission_b* (Noyer (1992)): 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:

- α-β is available for further vocabulary insertion.
- β is not available for further vocabulary insertion.

(33) *Completive verbal paradigm:*

	sg	pl
1masc	wala-y	n-wala
1fem	wala-y	n-wala
2masc	t-wala-d'	t-wala-m
2fem	t-wala-d'	t-wala-m-t
3masc	i-wala	wala-n
3fem	t-wala	wala-n-t

(34) *Abstract paradigm:*

$$V + \begin{array}{|c|c|} \hline [+1,-2,-pl,-fem] & [+1,-2,+pl,-fem] \\ \hline [+1,-2,-pl,+fem] & [+1,-2,+pl,+fem] \\ \hline [-1,+2,-pl,-fem] & [-1,+2,+pl,-fem] \\ \hline [-1,+2,-pl,+fem] & [-1,+2,+pl,+fem] \\ \hline [-1,-2,-pl,-fem] & [-1,-2,+pl,-fem] \\ \hline [-1,-2,-pl,+fem] & [-1,-2,+pl,+fem] \\ \hline \end{array}$$

Note:

For every vocabulary item, it must be listed whether it is a suffix or a prefix (indicated by a hyphen accompanying the exponent in question).

(35) *Vocabulary items:*

- /i-/ ↔ [-1,-2,-pl,-fem]
- /-n/ ↔ [-1,-2,+pl]

- c. /n-/ ↔ [+1,+pl]
- d. /-y/ ↔ [+1]
- e. /-m/ ↔ [+2,+pl]
- f. /-d'/ ↔ [+2]
- g. /t-/ ↔ [-1]
- h. /-t/ ↔ [+fem]/[-1,+pl]__

Note:

The system recognizes both *discontinuous bleeding* and *fission*.

- Discontinuous bleeding: An exponent may block another exponent even though the two markers have a different status as suffix or prefix: There is competition for a single (abstract, morphematic) position (a functional category). Thus, /t-/ is discontinuously bled by /-n/ (and regularly by /i-/); /-y/ is discontinuously bled by /n-/.
- Fission: An exponent may co-occur with another exponent even though there is only a single (abstract, morphematic) position (a functional category), irrespectively of their status as suffix or prefix: Feature decomposition, subanalysis. Thus, /t-/ can co-occur with /-d'/ because the two exponents realize different primitive features ([-1] vs. [+2]). In contrast, the /-t/ suffix (basically a [+fem] exponent) instantiates *extended exponence* and must therefore resort to a secondary (contextual) feature specification (so as to preclude it from showing up in first person contexts).

6. Extension of Frampton's analysis in Müller (2006a;b)

(5) a. *Weak verb inflection: believe*

	Present	Past
[1,sg]	glaub-e	glaub-te
[2,sg]	glaub-st	glaub-te-st
[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. *verb inflection: call*

	Present	Past
[1,sg]	ruf-e	rief
[2,sg]	ruf-st	rief-st
[3,sg]	ruf-t	rief
[1,pl]	ruf-en	rief-en
[2,pl]	ruf-t	rief-t
[3,pl]	ruf-en	rief-en

c. *Suppletive verb inflection: sein*

	Present	Past
[1,sg]	bin	war
[2,sg]	bi-st	war-st
[3,sg]	is-t	war
[1,pl]	sind	war-en
[2,pl]	seid	war-t
[3,pl]	sind	war-en

(36) *Two impoverishment rules for verb inflection in German:*

- a. [±1] → Ø/[-2,-pl,+past]__
- b. [±1] → Ø/[-2,+pl]__

(37) *Marker inventory:*

- a. /te/ ↔ [+past,-strong]
- b. /s/ ↔ [+2,-pl]
- c. /n/ ↔ [-2,+pl]
- d. /t/ ↔ [-1]
- e. /e/ ↔ []

(38) *Vocabulary insertion into impoverished T morphemes in German*

T	[-past]	
	[-strong]	[+strong]
[+1,-2,-pl]	/e/	/e/
[-1,+2,-pl]	/s/-/t/	/s/-/t/
[-1,-2,-pl]	/t/	/t/
[+1,-2,+pl]	/n/	/n/
[-1,+2,+pl]	/t/	/t/
[+1,-2,+pl]	/n/	/n/

T	[+past]	
	[-strong]	[+strong]
[+1,-2,-pl]	/te/	/Ø/
[-1,+2,-pl]	/te/-/s/-/t/	/s/-/t/
[+1,-2,-pl]	/te/	/Ø/
[+1,-2,+pl]	/te/-/n/	/n/
[-1,+2,+pl]	/te/-/t/	/t/
[+1,-2,+pl]	/te/-/n/	/n/

7. Appendix: Pike on German Verbs

7.1. *The Idea*

Observation:

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

Partial Syncretism in the Suppletive Paradigm: Subanalysis

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

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

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 (39) are *morphological constructions* (i.e., not decomposable)?

Answer:

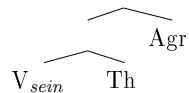
Probably not:

Subanalysis is pursued in many current morphological theories (see Müller (2008) for detailed argumentation):

- *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 (2006), 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))
- *Network Morphology* (Brown & Hippisley (2012))
- *Nanosyntax* (Caha (2009))
- *Optimality* (cf. the material in second part of this course)

7.2. Pike's (1965) Subanalysis of German Verb Inflection in Distributed Morphology

(40)



(41) Vocabulary insertion rules in Distributed Morphology

- (i) /b/ ↔ V_{sein} /___ [-3,-pl]
- (ii) /z/ ↔ V_{sein} /___ [+pl]
- (i) /a/ ↔ [+β] /___ V_{sein}, [-1,+2,+pl]
- (ii) /ɪ/ ↔ [+α] /___ V_{sein}
- (i) /∅/ ↔ [-1,+2] /___ V_{sein}, [+pl]
- (ii) /s/ ↔ [-1,±2] /___ V_{sein}, [-pl]
- (iii) /n/ ↔ [-2] /___ V_{sein}
- (iv) /∅/ ↔ [-pl] /___ V_{sein}, [+1]
- (v) /t/ ↔ V_{sein}, [±pl]

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