Theorien der Morphologie 1

Modul 006-1006: Grammatiktheorie, SoSe 2019

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Introduction: Morphology as a Separate Component of Grammar

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1. Background

Central assumption:
Inflectional morphology is closely related to syntactic structure, but there are cases where morphology does not share the same vocabulary with syntax (morphomic features, underspecified features), and there are other areas where principles or constraints are relevant for morphology that seem to play no role in syntax. Therefore, the null hypothesis in (1) that morphology = syntax, just applied to smaller linguistic objects, cannot be maintained.

(1) *The morphology = syntax assumption*:
"The alternative [to theories that envisage a separate morphological component] would be to reject the additional non-syntactic assumptions, and push the syntactic program that we have been discussing as far as possible. [...] There are just different morphemes and [...] these somehow interfere with one another when syntactic structure is built, but there is no competition, no ordering of morphemes, no duplication of syntactic features in terminals and vocabulary items, no extra mechanism of vocabulary insertion (as yet unformalized)." (Chris Collins on fb, 2016)

2. Morpho-Syntactic Features between Morphology and Syntax

Morphology:
Inventory of inflection markers (exponents)

Syntax:
Distribution of inflection markers (exponents)

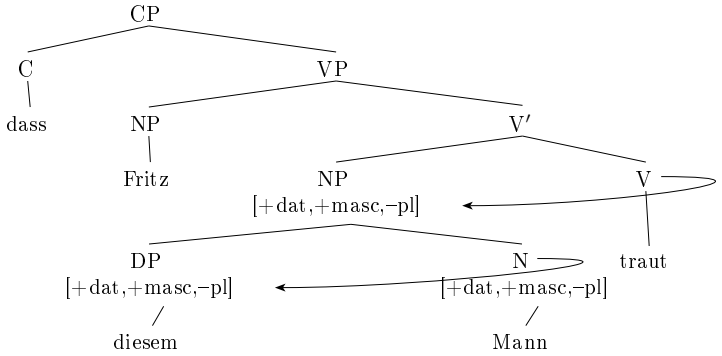
Paradigm 1: Pronominal inflection in German

	[−pl]			[+pl]		
	[+masc]	[+neut]	[+fem]	[+masc]	[+neut]	[+fem]
[+nom]	-er	-es	-e	-e	-e	-e
[+acc]	-en	-es	-e	-e	-e	-e
[+dat]	-em	-em	-er	-en	-en	-en
[+gen]	-es	-es	-er	-er	-er	-er

Syntactic structure

(2) dass Fritz diesem Mann traut
that Fritz$_{nom}$ this man$_{dat}$ trusts

(3)



Observation:
Here it looks as though one could assume that the morpho-syntactic features that are relevant in the morphological component (inventory) and the morpho-syntactic features that are relevant in the syntax (distribution) are identical.

3. Asymmetries

Problem:
There are asymmetries between morphology and syntax with respect to morpho-syntactic features. Two examples:
(i) *Inflection class features* are relevant in morphology, but irrelevant in syntax. These features thus qualify as *morphomic* (Aronoff (1994)).
(ii) *Underspecification* is relevant in morphology, but (typically) not in syntayx.

Paradigm 2: Russian noun inflection, inflection class [1], singular : [+masc]

	I		
	zavod$_m$ ('factory')	*student*$_m$ ('student')	*žitel*$_m$ ('inhabitant')
nom/sg	zavod-Ø	student-Ø	žitel'-Ø
akk/sg	zavod-Ø	student-a	žitel-ja
dat/sg	zavod-u	student-u	žitel-ju
gen/sg	zavod-a	student-a	žitel-ja
inst/sg	zavod-om	student-om	žitel-em
prep/sg	zavod-e	student-e	žitel-e

3.1. Necessity of Inflection Classes

Observation (Aronoff (1994), Corbett & Fraser (1993), Fraser & Corbett (1994), Halle (1994)):
Independently motivated features (morpho-syntactic features like gender, phonological features like soft or hard stem ending, semantic features like animacy) do not suffice to correctly predict the inflection class for a given stem in all cases. It seems that specific inflection class

Paradigm 3: Russian noun inflection, inflection class [2], singular: [+fem], [+masc]

	II			
	komnat$_f$ ('room')	*učitel'nic*$_f$ ('teacher')	*nedel'*$_f$ ('week')	*mužčin*$_m$ ('man')
nom/sg	komnat-a	učitel'nic-a	nedel-ja	mužčin-a
akk/sg	komnat-u	učitel'nic-u	nedel-ju	mužčin-u
dat/sg	komnat-e	učitel'nic-e	nedel-e	mužčin-e
gen/sg	komnat-y	učitel'nic-y	nedel-i	mužčin-y
inst/sg	komnat-oj(u)	učitel'nic-ej(u)	nedel-ej(u)	mužčin-oj(u)
prep/sg	komnat-e	učitel'nic-e	nedel-e	mužčin-e

Paradigm 4: Russian noun inflection, inflection class [3], singular: [+fem]

	III		
	tetrad'$_f$ ('notebook')	*myš'*$_f$ ('mouse')	*doč'*$_f$ ('daughter')
nom/sg	tetrad'-Ø	myš'-Ø	doč'-Ø
akk/sg	tetrad'-Ø	myš'-Ø	doč'-Ø
dat/sg	tetrad-i	myš-i	doč-er-i
gen/sg	tetrad-i	myš-i	doč-er-i
inst/sg	tetrad'-ju	myš'-ju	doč-er'-ju
prep/sg	tetrad-i	myš-i	doč-er-i

features on stems are unavoidable.

Observation:
Most of the variation concerns the choice of the plural marker. However, in the singular, too, inflection class features must be postulated in order to capture the assignment of stems to inflection classes: strong vs. weak masculine nouns. Again, independently motivated features of stems do not suffice here. (Cf., e.g., [±animate] – see *Dirigent* 'conductor' vs. *Planet* 'planet').

3.2. Syncretism and Underspecification

Observation:
There are many homonymies of inflection markers: *syncretism*. (There is a narrow notion of syncretism: one marker for more than one case. There is also a more general interpretation: formal identity of different cells in any given paradigm. I adopt the latter notion.) It is not a priori clear to what extent syncretism can be viewed as systematic, and to what extent it might be accidental. However, it is uncontroversial that at least some instances of syncretism are not accidental. Consequently, the question arises of how to account for the phenomenon.

Example:
There are 24 different paradigm cells in paradigm 1, but there are only 5 distinct markers: *-e*, *-er*, *-en*, *-es*, *-em*. Thus, there is only one marker for the morpho-syntactic feature specifications [+dat,+masc,–pl] and [+dat,+neut,–pl]: *-em*; and this marker is different from all the other markers in paradigm 1.

Paradigm 5: noun inflection in Russian (simplified)

	[–pl]			[+pl]		
	[1]	[2]	[3]	[1]	[2]	[3]
[+nom]	-Ø	-a	-Ø	-i	-i	-i
[+acc]	-Ø/-a	-u	-Ø	-i/-ov(-ej)	-i/-Ø	-i/-ej
[+dat]	-u	-e	-i	-am	-am	-am
[+gen]	-a	-i	-i	-ov(-ej)	-Ø	-ej
[+inst]	-om	-oj	-ju	-ami	-ami	-ami
[+prep]	-e	-e	-i	-ax	-ax	-ax

Paradigm 6: German noun inflection, inflection classes [1]-[4]

	[1]		[2]	[3]		[4]	
	Hund$_m$ 'dog'	*Schaf*$_n$ 'sheep'	*Baum*$_m$ 'tree'	*Buch*$_n$ 'book'	*Mann*$_m$ 'man'	*Strahl*$_m$ 'ray'	*Auge*$_n$ 'eye'
nom/sg	Hund-Ø	Schaf-Ø	Baum-Ø	Buch-Ø	Mann-Ø	Strahl-Ø	Auge-Ø
acc/sg	Hund-Ø	Schaf-Ø	Baum-Ø	Buch-Ø	Mann-Ø	Strahl-Ø	Auge-Ø
dat/sg	Hund-Ø	Schaf-Ø	Baum-Ø	Buch-Ø	Mann-Ø	Strahl-Ø	Auge-Ø
gen/sg	Hund-es	Schaf-es	Baum-es	Buch-es	Mann-es	Strahl-s	Auge-s
nom/pl	Hund-e	Schaf-e	Bäum-e	Büch-er	Männ-er	Strahl-en	Auge-n
acc/pl	Hund-e	Schaf-e	Bäum-e	Büch-er	Männ-er	Strahl-en	Auge-n
dat/pl	Hund-en	Schaf-en	Bäum-en	Büch-ern	Männ-ern	Strahl-en	Auge-n
gen/pl	Hund-e	Schaf-e	Bäum-e	Büch-er	Männ-er	Strahl-en	Auge-n

Analysis: natural classes and underspecification:
A common basis of the instances of a given syncretism is sought – a property that the different contexts exhibiting an identical marker have in common. This property characterizes a *natural class* of morpho-syntactic specifications. In the case at hand, [+dat,+masc,–pl]- and [+dat,+neut,–pl] contexts differ only with respect to gender information. Assumption: [+masc] and [+neut] form a natural class. Natural classes can be derived from a *decomposition* of the standard morpho-syntactic features into combinations of more abstract primitive features.

(4) *Decomposition of gender features in German*:
- a. masculine = [+masc,–fem]
- b. feminine = [–masc,+fem]
- c. neuter = [–masc,–fem]
- d. [ ] = [+masc,+fem]

Underspecification:
The idea then is that inflection markers do not have to be characterized by fully specified morpho-syntactic features; they can also be characterized by *underspecified* morpho-syntactic information. For instance:

The marker *-em* is not characterized as [+dat,+masc,–fem,–pl] or as [+dat,–masc,–fem,–pl]. Rather, this marker is characterized by a feature specification that is underspecified with

Paradigm 7: German noun inflection, inflection classes [5]-[8]

	[5] *Planet*$_m$ 'planet'	[6] *Ziege*$_f$ 'goat'	[7] *Maus*$_f$ 'mouse'	[8]I *Drangsal*$_f$ 'distress'
nom/sg	Planet-Ø	Ziege-Ø	Maus-Ø	Drangsal-Ø
acc/sg	Planet-en	Ziege-Ø	Maus-Ø	Drangsal-Ø
dat/sg	Planet-en	Ziege-Ø	Maus-Ø	Drangsal-Ø
gen/sg	Planet-en	Ziege-Ø	Maus-Ø	Drangsal-Ø
nom/pl	Planet-en	Ziege-n	Mäus-e	Drangsal-e
acc/pl	Planet-en	Ziege-n	Mäus-e	Drangsal-e
dat/pl	Planet-en	Ziege-n	Mäus-en	Drangsal-en
gen/pl	Planet-en	Ziege-n	Mäus-e	Drangsal-e

Paradigm 8: Noun inflection in German (simplified)

	$[1]_{m,n}$	$[2]_m$	$[3]_{n,m}$	$[4]_{m,n}$	$[5]_m$	$[6]_f$	$[7]_f$	$[8]_f$
[+nom,–pl]	-Ø	-Ø	-Ø	-Ø	-Ø	-Ø	-Ø	-Ø
[+acc,–pl]	-Ø	-Ø	-Ø	-Ø	-(e)n	-Ø	-Ø	-Ø
[+dat,–pl]	-Ø	-Ø	-Ø	-Ø	-(e)n	-Ø	-Ø	-Ø
[+gen,–pl]	-(e)s	-(e)s	-(e)s	-(e)s	-(e)n	-Ø	-Ø	-Ø
[+nom,+pl]	-(e)	-"(e)	-"er	-(e)n	-(e)n	-(e)n	-"(e)	-(e)
[+acc,+pl]	-(e)	-"(e)	-"er	-(e)n	-(e)n	-(e)n	-"(e)	-(e)
[+dat,+pl]	-(e)n	-"(e)n	-"ern	-(e)n	-(e)n	-(e)n	-"(e)n	-(e)n
[+gen,+pl]	-(e)	-"(e)	-"er	-(e)n	-(e)n	-(e)n	-"(e)	-(e)

respect to gender: [+dat,–fem,–pl].

Observation:
The same situation arises with case features. Consider again paradigm 1. The marker *-es* is employed for both nominative neuter and accusative neuter contexts. This syncretism is in line with a basic Indo-European principle (see (5)), and thus certainly not accidental.

(5) *Reconstructed case system of Proto-Indo-European, singular only*

	*e/o stems		other stems	
	MASC/FEM	NEUT	MASC/FEM	NEUT
NOM	*-*s*	*-*m*	*-*s*/*-∅	*-∅
VOC	*-∅	*-*m*	*-∅	*-∅
ACC	*-*m*	*-*m*	*-*m*	*-∅

The syncretism with *-e* in nominative feminine and accusative feminine contexts in German looks systematic in the same way (the same may also hold for the plural).

Analysis (Jakobson (1962a;b), Bierwisch (1967)):
The cases are decomposed into combinations of primitive features.

(6) *Decomposition of case features in German*:

a. nominative = [–obj,–obl]
b. accusative = [+obj,–obl]
c. dative = [+obj,+obl]
d. genitive = [–obj,+obl]

Consequence:
Nominative and accusative form a natural class.
Genitive and dative form a natural class.
Accusative and dative form a natural class.
Nominative and genitive form a natural class.
Nominative and dative do *not* form a natural class.
Accusative and genitive do *not* form a natural class.

3.3. Alternative Accounts of Syncretism

Side remark:
Deriving syncretism by (feature decomposition and) underspecification is a well-established research strategy. However, there are also other theoretical approaches to syncretism, including those in (7) (none of these alternative approaches is inherently incompatible with underspecification).

(7) *Alternative approaches*:

a. *Paradigm geometry*
Refs.: Johnston (1996), McCreight & Chvany (1991), Plank (1991), Postma (1998), Gallmann (2004).
The main idea is that syncretism are derivable from an appropriate placement of the various paradigm cells (e.g., adjacency of paradigm cells in appropriately revised, or designed, paradigms).
b. *Rules of referral*
Refs.: Zwicky (1985), Corbett & Fraser (1993), Stump (2001)
Rules of referral state the identity of markers but make no further attempt to actually derive it.
c. *Impoverishment rules*
Refs.: Bonet (1991), Noyer (1992; 1998), Halle & Marantz (1993; 1994), Bobaljik (2002), Frampton (2002)
Impoverishment rules are a central building block of Distributed Morphology. Impoverishment rules reduce morpho-syntactic feature specifications on the way from syntax to morphology; morphology then operates on simplified structures, and a *retreat to the general case* results.

4. Underspecification and Competition

4.1. Consequence of Underspecification

Underspecification typically has the effect of producing a *competition* of different markers for one and the same morpho-syntactic contexts.

1. Such a competition can be resolved by invoking an *extrinsic ordering* of inflection markers (alternatively, of rules that introduce these markers).
   Refs.: Bierwisch (1967), Wurzel (1987; 1998), Halle (1994).

2. An alternative (and conceptually far more attractive) concept relies on the notion of *specificity*. Cf. the *Subset Principle* (accompanied by a notion of specificity), the *Elsewhere Principle*, the *Blocking Principle*, *Panini's Principle*, the *Proper Inclusion Principle*, etc.
   Refs.: Kiparsky (1973), Di Sciullo & Williams (1987), Fanselow (1991), Anderson (1992), Lumsden (1992), Noyer (1992), Williams (1994), Halle (1997), Williams (1997), Wiese (1999), Stump (2001).

4.2. A Simple Approach Employing Underspecification

Preliminary assumption:
Assume as given (a) a stem and (b) the smallest set of fully specified morpho-syntactic feature structures for this stem encoding the range of possible word forms. This set includes both features that are inherent to the stem, like (for nouns) inflection class and gender, and features that are variable and non-inherent, like (for nouns) case and number. This information creates a paradigm whose cells need to be filled. For each pair of (a) and (b), the correct word form (or filled paradigm cell) is determined by choosing a compatible inflection marker according to the Subset Principle.

(8) *Subset Principle*:
An inflection marker F is merged with a stem S for a fully specified feature structure M iff (i) and (ii) hold:
   (i) The morpho-syntactic features of F are a subset of the morpho-syntactic features of M.
   (ii) F is the most specific inflection marker among those that satisfy (i).

(9) *Specificity of Inflection Markers*:
An inflection marker F_i is more specific than an inflection marker F_j iff F_i has more (relevant) morpho-syntactic features than F_j.

Note:

- The following analysis combines aspects of the analyses in Bierwisch (1967), Blevins (1995) (most importantly), Wunderlich (1997a), Wiese (1999), Müller (2003), Trommer (2005).
- Assumption: Plural does not have gender features in German.
- Assumption: The morphological exponents are either consonantal or ə; an additional ə with consonantal markers does not have to be morphologically encoded (it is added in the phonological component).

(10) *Marker entries*
   a. /n/ ↔ [+pl,+obj,+obl]
   b. /m/ ↔ [–fem,+obj,+obl]
   c. /s/ ↔ [–fem,+obl]

   d. /r/ ↔ [+obl]
   e. /n/ ↔ [+mask,–fem,+obj,–obl]
   f. /r/ ↔ [+mask,–fem,–obl]
   g. /s/ ↔ [–fem,–obl]
   h. /e/ ↔ [ ]

(11) *Interaction*

dies	masc.sg. [+m,-f]	neut.sg. [–m,–f]	fem.sg. [–m,+f]	pl. [+pl]
nom [–obj,–obl]	**r** s e	**s** e	**e**	**e**
acc [+obj,–obl]	**n** r s e	**s** e	**e**	**e**
dat [+obj,+obl]	**m** s r e	**m** s r e	**r** e	**n** r e
gen [–obj,+obl]	**s** r e	**s** r e	**r** e	**r** e

5. Further Instantiations of Grammatical Categories

Observation:
There is similar evidence for decomposition and underspecification for virtually all (instances of) grammatical categories: number, person, tense, aspect, inflection class, ...

5.1. Numerus und Person im Englischen

(12) *Das englische Verb 'be' im Präsens*

	Singular	Plural
1	am	are
2	are	are
3	is	are

(13) *Unterspezifikationsanalyse*:
   a. /am/ ↔ [1,–pl]
   b. /is/ ↔ [3,–pl]
   c. /are/ ↔ [ ]

Bemerkung: /are/ ist nicht vollständig ohne Spezifikation. Vermerkt muss mindestens sein, dass es sich um eine finite Verbform von 'be' handelt.

(14) *Reguläre englische Verben in Präsens und Präterium*:

	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

5.2. Numerus im Gotischen

(15) *Pronomina, Nomina, Verben im Gotischen*

	Pronomen/Nominativ		*Nomen*/Nominativ	*Verb* ('nehmen'), Präsens	
	1.Pers.	3.Pers.	Gast	1. Person	2. Person
Singular	ik	is	gast	nima	nimiþ
Dual	wit	eis	gasteis	nimoːs	nimand
Plural	weis	eis	gasteis	nimam	nimand

(16) *Numerusmerkmale*:

a. Singular = [+sg,–pl]
b. Dual = [–sg,–pl]
c. Plural = [–sg,+pl]

(17) *Unterspezifikationsanalyse*:

a. /is/ ↔ [1.Pers,Nom,+sg,–pl]
b. /eis/ ↔ [3.Pers,Nom,–sg]

5.3. Genus im Norwegischen

Im Norwegischen (bokmål) gibt es zwei Genera (Neutrum und Utrum) und zwei Numeri (Singular und Plural). Wie im Deutschen gibt es eine starke und eine schwache Deklination der Adjektive.

(18) *Adjektivdeklination im Norwegischen*

STARK	Utrum	Neutrum
Singular	Ø	t
Plural	e	e

SCHWACH	Utrum	Neutrum
Singular	e	e
Plural	e	e

(19) *Unterspezifikationsanalyse*:

a. /Ø/ ↔ [–neut,–pl,+stark]
b. /t/ ↔ [+neut,–pl,+stark]
c. /e/ ↔ [ ]

5.4. Person im Isländischen

(20) *Konjugation im Isländischen*

[A] Schwache Verben, Klasse 1: *krefja* ('fordern')

	Präsens	Präteritum
1.Sg.	kref	krafði
2.Sg.	krefur	krafðir
3.Sg.	krefur	krafði
1.Pl.	krefjum	kröfðum
2. Pl.	krefjið	kröfðuð
3. Pl.	krefja	kröfðu

[B] Starke Verben, Klasse 3: *sleppa* ('entschlüpfen')

	Präsens	Präteritum
1.Sg.	slepp	slapp-Ø
2.Sg.	sleppur	slappst
3.Sg.	sleppur	slapp-Ø
1.Pl.	sleppum	sluppum
2.Pl.	sleppið	sluppuð
3.Pl.	sleppa	sluppu

(21) *Personmerkmale im Isländischen*:

a. 1. Person = [+1,–2]
b. 2. Person = [–1,+2]

c. 3. Person = [–1,–2]

5.5. Person im Wambon

(22) *Konjugation im Wambon (Trans New-Guinea)*

a. andet-*ep*-mbo
essen-1.SG-PRÄT
b. andet-*Ø*-mbo
essen-2./3.SG-PRÄT

(23) *Unterspezifikationsanalyse*

a. /ep/ ↔ [+1,–2]
b. /Ø/ ↔ [ ]

Oder:

(24) *Unterspezifikationsanalyse*

a. /ep/ ↔ [+1,–2]
b. /Ø/ ↔ [–1]

5.6. Person im Hunzib

(25) *Konjugation im Hunzib (Nakh-Dagestanisch)*:

a. də hĩyaa-*č* əcu
1.PRON öffnen-1./2.PRÄS Tür
'Ich werde die Tür öffnen.'
b. mə bok'o.l-*čo* heƛe
2.PRON sammeln-1./2.PRÄS Walnüsse
'Du wirst Walnüsse sammeln.'
c. oλul hĩyaa-*Ø* əcu
DEM öffnen-3.PRÄS Tür
'Sie/er öffnet die Tür.'

(26) *Personmerkmale im Hunzib*:

a. 1. Person = [+1,–3]
b. 2. Person = [–1,–3]
c. 3. Person = [–1,+3]

5.7. Kasus im Tschechischen 1

(27) *Deklination der Nomina im Tschechischen*

	masc1 −anim	masc2 +anim	masc3 +anim	masc4 −anim	fem1	fem2	neutr1	neutr2	neutr3
Singular									
Nom	-∅	-∅	-∅	-∅	-e	-a	-∅	-o	-í
Akk	-∅	-e	-a	-∅	-i	-u	-∅	-o	-í
Gen	-e	-e	-a	-a/u	-e	-y	-e	-a	-í
Dat	-i	-i/ovi	-u/ovi	-u	-i	-ě	-i	-u	-í
Lok	-i	-i/ovi	-u/ovi	-u	-i	-ě	-i	-u	-í
Ins	-em	-em	-em	-em	-i	-ou	-em	-em	-ím
Dual									
Nom					-e	-y		-a	-í
Akk					-e	-y		-a	-í
Gen					-ou	-ou		-ou	-í
Dat					-ám	-ám		-ům	-ím
Lok					-ou	-ou		-ou	-ích
Ins					-ama	-ama		-y	-íma
Plural									
Nom	-e	-i/ove	-i/ove	-y	-e	-y	-a	-a	-í
Akk	-e	-e	-y	-y	-e	-y	-a	-a	-í
Gen	-ů	-ů	-ů	-ů	-í	-∅	-∅	-∅	-í
Dat	-ům	-ům	-ům	-ům	-ím	-ám	-ům	-ům	-ím
Lok	-ích	-ích	-ech	-ech	-ích	-ách	-ech	-ech	-ích
Ins	-i	-i	-y	-y	-emi	-ámi	-y	-y	-ími

5.8. Kasus im Tschechischen 2

(28) *Singular der Deklinationen masc2 und fem1*:

	masc2 +anim	fem2
Singular		
Nominativ	-∅	-a
Akkusativ	-e	-u
Genitiv	-e	-y
Dativ	-i/ovi	-ě
Lokativ	-i/ovi	-ě
Instrumental	-em	-ou

(29) *Kasusmerkmale im Tschechischen*

a. Nominativ = [−obl,−obj,−präp]
b. Akkusativ = [−obl,+obj,−präp]
c. Genitiv = [+obl,+obj,−präp]
d. Dativ = [+obl,+obj,+präp]
e. Lokativ = [+obl,−obj,+präp]
f. Instrumental = [+obl,−obj,−präp]

6. Further Evidence for Morphomic Features

Note:
In some cases it looks like feature decomposition alone does not suffice to account for systematic cases of syncretism because the syncretism spans *two categories*. Arguably, this goes for syncretisms involving feminine/singular and plural in German pronominal inflection (see paradigm 1): However, feminine and plural do not form a natural class in any obvious sense that would be predicted by the distribution of these categories in the syntax.

Another case:
Verb inflection in Boraana Oromo (Afro-Asiatic; Kenya).

(30) *Verb infleciton in Boraana Oromo* (Stroomer (1995))

		aff,main	aff,neg	aff,sub	neg,sub
present/sg	1	-a	-u	-u	-ne
	2	-ta	-tu	-tu	-ne
	3masc	-a	-u	-u	-ne
	3fem	-ti	-tu	-tu	-ne

Observation:
It looks like 3masc and 1 form a natural class, as do 3fem and 2: The syncretisms span gender and person. If these instances of syncretism are to be accounted for via underspecification, the features involved must be non-syntactic and abstract – i.e., morphomic (see Bonami & Boyé (2010) for a general approach along these lines).

7. Theories of Inflection

Stump (2001) devises a useful taxonomy of theories of inflection.

(31) *Stump's taxonomy of theories of inflection*:

incremental	realizational
lexical	inferential

1. *Incremental analysis*:
   Inflection markers add morpho-syntactic features that would otherwise not be present on a word form.

2. *Realizational analysis*:
   Inflection markers do not add morpho-syntactic features; all pieces of morpho-syntactic information is independently available.

3. *Lexical analysis*:
   Inflection markers are associated with (possibly abstract) morphemes that exist independently, as separate objects in the mental lexicon.

4. *Inferential analysis*:
   Inflection markers do not have morpheme status and do not exist independently, as separate objects.

Some theories

(32) a. lexical-incremental:
Lieber (1992), Wunderlich (1996; 1997b;a) (Minimalist Morphology)
b. lexical-realizational:
Halle & Marantz (1993; 1994) (Distributed Morphology)
c. inferential-incremental:
hardly attested
d. inferential-realizational:
Matthews (1991), Anderson (1992), Corbett & Fraser (1993), Aronoff (1994), Stump (2001; 2016), Blevins (2004), Brown & Hippisley (2012) (stem/word and paradigm approaches)

Differences Abstracting away from underspecification, (33) shows different treatments.

(33) a. Lexial approaches (incremental or realizational):
$studentu_{[+N,+dat,+masc,-pl]} \Leftarrow /\text{student}/_{[+N,+masc,class[1]]} + /\text{u}/_{[+dat,+masc,-pl,class[1]]}$
$diesem_{[+N,+dat,+masc,-pl]} \Leftarrow /\text{dies}/_{[+D]} + /\text{em}/_{[+dat,+masc,-pl]}$
b. Inferential-realizational approaches:
$studentu_{[+N,+dat,+masc,-pl]}$
$\Leftarrow$ word form of the stem /student/ for the specification [+dat,−pl]
$diesem_{[+D,+dat,+masc,-pl]}$
$\Leftarrow$ word form of the stem /dies/ for the specification [+dat,+masc,−pl]

Comment
The type of theory sketched above is lexical (i.e., inflection markers exist as separate objects) and realizational (i.e., inflection markers do not contribute new features that the word form would not have otherwise). However, as will become clear, this approach differs significantly from Distributed Morphology.

Note:
Roughly the same distinction as between lexical and inferential theories had already been proposed by Hockett (1954): *item-and-arrangement* approaches vs. *item-and-process* approaches.

8. Empirical Evidence for Realizational Theories

8.1. Extended Exponence

(34) *Extended exponence* (Matthews (1972; 1974)):
The morpho-syntactic properties that are associated with an inflected word, can be realized by more than one morphological exponent in a word.

(35) *Plural formation with diminutives in Breton*:
a. bagig ‘small boat’
b. bagoùigoù ‘small boats’

(36) *Negative preterite forms in Swahili*:
a. tu-li-taka ‘we wanted’

b. ha-tu-ku-taka ‘we did not want’
ku = neg.pret, ha = neg.

(37) *Participle 2 in German*:
a. sprechen
b. ge-sproch-en (3 exponents)

(38) *Standard ways out → extended exponence*:

- *Feature decomposition*:
Upon closer inspection, there is in fact no extended exponence.
- *Contextual features*:
The second exponent only uses the features of the first exponent as secondary, contextual features.
- *Enrichment*:
There is a rule that copies the relevant features prior to morphological realization.
- *Denial*:
Features can be realized more than once without any problems.

(39) *Abstract example*:
Kind-er-n – Kind-PL-PL.DAT
a. PL = [−sg,+pl]
er ↔ [−sg], *n* ↔ [+pl,+obj,+obl]
b. [+pl] ≠ ([+pl])
er ↔ [+pl], *n* ↔ [+obj,+obl]([+pl])
c. Ø → [+pl]/[+pl],[+obj,+obl]__
er ↔ [+pl], *n* ↔ [+obj,+obl,+pl]
d. *er* ↔ [+pl], *n* ↔ [+obj,+obl,+pl]

8.2. Amorphematic Exponence

In many cases a morphological exponent does not look like an affix; here it is a priori difficult to analyze it as a lexical item.

(40) *Umlaut with plurals in German*:
a. Mutter – Mütter
b. Tal – Täler

(41) *Ablaut with strong verbs in German*:
a. werfen – warfen
b. gießen – gossen

(42) *Subtractive perfect morphology in Papago (Uto-Aztecan)* (Anderson (1992, 65), Aronoff & Fudeman (2005, 47)):

Imperfekt			Perfekt		
Sg.		Pl.	Sg.		Pl.
him	'gehend'	hihim	hi:	'ging'	hihi
hi:nk	'bellend'	hihink	hi:n	'bellte'	hihin
gatwid	'schießend'	gagtwid	gatwi	'schoss'	gagtwi
'elpig	'schälend'	'e'elpig	'elpi	'schälte'	'e'elpi

Way out: amorphematic exponence

Assumption:
There are empty affixes with diacritic elements that encode the non-affixial properties.

(43) *Plural markers in German*:
   a. *"Ø* ↔ [+pl,KlasseXY]
      (zero exponent with a floating feature)
   b. *"(e)* ↔ [+pl,KlasseXY]
      (optionally realizable ə with a floating umlaut feature)

(44) Subtractive perfect exponent in Papago:
   $^{[-1]}$Ø ↔ [+perf]

(45) Semantics of the diacritic elements:
   a. *"X* = a vowel undergoes umlaut if it is closest to X and can in principle be affected by umlaut.
   b. $^{[-1]}$Ø = the closest segment to the left of X is deleted.

Note:
Influential analyses of this type have been developed by McCarthy (1981) (for binyanim in Arabic) and Marantz (1982) (for reduplication). Also see Trommer (2011; 2014; 2015) for a recent optimality-theoretic approach.

9. Word and Paradigm Approaches

- All approaches mentioned so far presuppose that inflected words are separable into a *stem* and one or more *inflectional exponent(s)*.
- In strict *Wort and Paradigm Approaches*, this assumption is not made (cf., e.g., Matthews (1991), Blevins (2004)). Here the inflected word is a primitive of grammar. Nevertheless, generalizations can be established over the set of all inflected word forms in a paradigm, and these generalizations can to some extent trace the effects of morphological rules of inflection.

Final remark:
In principle, mixed approaches are conceivable, e.g.:

- Some complex word forms are derived by rules of inflection, others aren't (e.g., weak vs. strong verbs in German or English).

- Some aspects of complex word forms are derived by concatenation of two lexical items; in addition, there can be rules of inflection that affect a stem without lexical material being involved (e.g., plural by affixation vs. plural by umlaut in German).

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