

Fission and Impoverishment in German Verb Inflection

1. *Goals* I pursue two main goals in this talk. First, I show that an approach to German verb inflection in terms of Distributed Morphology (Halle & Marantz (1993; 1994)) that relies on fission and impoverishment can derive all instances of syncretism in a simple and maximally general way, thus providing further evidence for these two operations as means to capture systematic mismatches of morphology and syntax. Second, I address the question of whether this analysis can be transferred from a post-syntactic approach to inflectional morphology based on late insertion, to a pre-syntactic approach based on Agree-driven Merge (as assumed for syntax in Chomsky (2001; 2005)).

2. *Data* There are three verbal inflection classes in German (see (1)): strong conjugation, weak conjugation, and the suppletive verb *be*. These paradigms exhibit four instances of syncretism (i.e., systematic marker homonymy) that call for a principled explanation. (i) The inflection markers for 1.SG.PAST and 3.SG.PAST contexts are identical in all classes. (ii) The inflection markers for 1.PL and 3.PL contexts are identical in all tenses and classes. These two instances of syncretism are well known and uncontroversial. The situation is slightly more involved with the remaining two instances of syncretism: (iii) The marker for 3.SG.PRES is *t*, and the very same markers shows up in 2.PL.PRES contexts in the two main inflection classes in (1). (iv) Finally, the marker for 2.SG contexts (*st*) is identical to the marker for 3.SG.PRES contexts (*t*), except for the initial *s*. I contend that this strongly suggests a subanalysis of the marker *s-t* into two separate items. Of these four cases of syncretism, only (i)-(ii) have been addressed before (Wiese (1994), Wunderlich (1996), Eisenberg (2000), Frampton (2002)); and only Frampton derives them as the general, system-wide properties that they arguably are (rather than as the result of individual inflection marker specifications of an arbitrary nature); (iii)-(iv) have not yet been addressed at all (except for a few tentative remarks on (iii) in Bierwisch (1961)).

3. *Background* I assume a standard Distributed Morphology approach in which post-syntactic insertion of (often underspecified) vocabulary items into functional morphemes is regulated by the Subset Principle (Halle (1997), among others): Insertion applies to the most specific inflection marker that fits into a given syntactic context. The notion of specificity adopted here is based on both quantity and quality of the features on vocabulary items (Lumsden (1992), Noyer (1992)); the relevant feature hierarchy is *Tense* > *Number* > *Person*. Next, person categories (1., 2., 3., and – irrelevantly in German – 1.INCL) are decomposed into combinations of the more primitive features [± 1], [± 2], as in (2) (see Noyer (1992), Wiese (1994), Frampton (2002)). It follows that 1./3. person form a natural class (characterized by [-2]), as do 2./3. person ([-1]), but not 1./2. person. Thus, syncretism is predicted to affect 1./3. and 2./3. categorizations, but not 1./2. categorizations, and this is exactly what we see in the syncretism patterns in (1). Finally, the locus of insertion of verbal inflection markers in German is T, which has formed a complex word with V (be it by syntactic raising or by lowering, within or after syntax; Embick & Noyer (2001)).

4. *Analysis* The distribution of syncretism in (1) strongly supports the concepts of fission (as in Noyer (1992), Frampton (2002), Müller (2005); also cf. Halle & Marantz (1993)) and impoverishment (see Bonet (1991), Halle & Marantz (1993; 1994), Noyer (1992; 1998), Bobaljik (2002), Frampton (2002), Harley (2004)). First, assuming T in German to be subject to fission, vocabulary insertion can apply iteratively, in accordance with the Subset Principle, until either all morpho-syntactic features of T are discharged, or no vocabulary item is left that can be inserted; this makes a subanalysis of *s-t* possible. Second, the two post-syntactic impoverishment operations in (3) neutralize syntactic person feature distinctions in morphology, and thus ensure that the syncretisms (i)-(ii) can be derived as system-wide patterns (also cf. Frampton (2002)). Crucially, given fission of T and impoverishment as in (3-ab), (4) can be assumed to be the complete inventory of verbal inflection markers in German, with all instances of syncretism derived. In this approach, */t/* is a general marker for [-1] contexts (2./3. person). It is inserted into 2.SG contexts *after* the more specific marker */s/* (which discharges only [$+2, -pl$]), yielding *s-t*; */t/* is also inserted into 3.SG.PRES and 2.PL contexts (this correctly derives syncretism (iii) by underspecification of a vocabulary item, not as a system-wide pattern); and the only reason why */t/* does not show up in 3.PL contexts is because impoverishment rule (3-b) has deleted [-1] (*/t/* does in fact co-occur with */n/*, yielding *n-t*, in 3.PL.PRES contexts in Middle High German, as predicted if (3-b) is confined to past environments here).

5. *Alternative* Given optimal design considerations, one might expect inflectional morphology to rely on elementary operations as they have been assumed for syntax. The pre-syntactic, non-lexicalist approach outlined in Alexiadou & Müller (2005) dispenses with post-syntactic insertion of inflection markers in favour of Agree-driven Merge in the numeration that is triggered by (possibly trivial: Aronoff (1994)) inflection class features on stems acting as probes. The numeration lacks structure but provides just enough information for inflection to apply, via lexical subarrays that underlie extended projections (or phases if the latter include TP; Richards (2004)). Functional morphemes provide the context for Agree-Merge of underspecified inflection markers with stems; Subset Principle/specificity effects follow from general restrictions on Agree (Chomsky (2001)). This approach integrates crucial features of Distributed Morphology (including the distinction between abstract functional heads like T that are active in syntax, and concrete vocabulary items like *s-t* that are only active in morphology); it can also be shown to be compatible with certain morphological operations applying post-syntactically (e.g., many of the displacement cases in Embick & Noyer (2001)). However, among many other questions, it is far from clear how impoverishment and fission can be expressed in such a pre-syntactic approach. I will sketch solutions to these problems based on the present analysis of German verb inflection: Pre-syntactic impoverishment must make features inaccessible for morphology without actually deleting them (because they are relevant in syntax); and pre-syntactic fission requires an assumption about class feature probes in the numeration that has sometimes been made for *wh*-feature probes in multiple *wh*-movement languages in syntax: Checking of certain probes does not necessarily result in their immediate deletion, so that they can trigger further Agree operations. The upshot will be that both concepts can be expressed in a pre-syntactic approach, but there is a price to be paid.

(1) a. *Weak conjugation*
glauben ('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. *Strong conjugation*
rufen ('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 conjugation*
sein ('be')

	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

(2) *Decomposition of person features:*

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

(3) *Impoverishment rules for German verb inflection:*

- a. $[\pm 1] \rightarrow \emptyset / [-2, -pl, +past] _$
- b. $[\pm 1] \rightarrow \emptyset / [-2, +pl] _$

(4) *Vocabulary items:*

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

(5) *Vocabulary insertion into impoverished Ts in German*

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

References

- Alexiadou, Artemis & Gereon Müller (2005): Class Features as Probes. Ms., Universität Stuttgart and Universität Leipzig. To appear in Asaf Bachrach and Andrew Nevins (eds.), *Paradigms*. Oxford University Press.
- Aronoff, Mark (1994): *Morphology by Itself*. MIT Press, Cambridge, Mass.
- Bierwisch, Manfred (1961): Zur Morphologie des deutschen Verbalsystems. PhD thesis, Universität Leipzig.
- Bobaljik, Jonathan (2002): Syncretism without Paradigms: Remarks on Williams 1981, 1994. In: G. Booij & J. van Marle, eds., *Yearbook of Morphology 2001*. Kluwer, Dordrecht, pp. 53–85.
- Bonet, Eulàlia (1991): Morphology after Syntax. PhD thesis, MIT, Cambridge, Mass.
- Chomsky, Noam (2001): Derivation by Phase. In: M. Kenstowicz, ed., *Ken Hale. A Life in Language*. MIT Press, Cambridge, Mass., pp. 1–52.
- Chomsky, Noam (2005): On Phases. Ms., MIT, Cambridge, Mass.
- Eisenberg, Peter (2000): *Grundriß der deutschen Grammatik. Band 1: Das Wort*. Metzler, Stuttgart.
- Embick, David & Rolf Noyer (2001): Movement Operations after Syntax, *Linguistic Inquiry* 32, 555–595.
- Frampton, John (2002): Syncretism, Impoverishment, and the Structure of Person Features. In: *Papers from the Chicago Linguistics Society Meeting*. Vol. 38, pp. 207–222.
- Halle, Morris (1997): Distributed Morphology: Impoverishment and Fission. In: B. Bruening, Y. Kang & M. McGinnis, eds., *Papers at the Interface*. Vol. 30, MITWPL, pp. 425–449.
- Halle, Morris & Alec Marantz (1993): Distributed Morphology and the Pieces of Inflection. In: K. Hale & S. J. Keyser, eds., *The View from Building 20*. MIT Press, Cambridge, Mass., pp. 111–176.
- Halle, Morris & Alec Marantz (1994): Some Key Features of Distributed Morphology. In: A. Carnie, H. Harley & T. Bures, eds., *Papers on Phonology and Morphology*. Vol. 21 of *MIT Working Papers in Linguistics*, MITWPL, Cambridge, Mass., pp. 275–288.
- Harley, Heidi (2004): The Importance of Impoverishment. Ms., University of Arizona.
- Lumsden, John (1992): Underspecification in Grammatical and Natural Gender, *Linguistic Inquiry* 23, 469–486.
- Müller, Gereon (2005): Syncretism and Iconicity in Icelandic Noun Declensions: A Distributed Morphology Approach. In: G. Booij & J. van Marle, eds., *Yearbook of Morphology 2004*. Springer, Dordrecht, pp. 229–271.
- Noyer, Rolf (1992): Features, Positions, and Affixes in Autonomous Morphological Structure. PhD thesis, MIT, Cambridge, Mass.
- Noyer, Rolf (1998): Impoverishment Theory and Morphosyntactic Markedness. In: S. Lapointe, D. Brentari & P. Farrell, eds., *Morphology and its Relation to Phonology and Syntax*. CSLI, Palo Alto, pp. 264–285.
- Richards, Marc (2004): Object Shift and Scrambling in North and West Germanic: A Case Study in Symmetrical Syntax. PhD thesis, University of Cambridge, Cambridge, UK.
- Wiese, Bernd (1994): Die Personal- und Numerusendungen der deutschen Verbformen. In: K.-M. Köpcke, ed., *Funktionale Untersuchungen zur deutschen Nominal- und Verbalmorphologie*. Niemeyer, Tübingen, pp. 161–191.
- Wunderlich, Dieter (1996): Minimalist Morphology: The Role of Paradigms. In: G. Booij & J. van Marle, eds., *Yearbook of Morphology 1995*. Kluwer, Dordrecht, pp. 93–114.