Structural Cumulativity in German Umlaut

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Summary: A central argument for the purely morphological status of German Umlaut (fronting of stem vowels in specific stem+affix combinations) is the fact that umlaut is not completely predictable, but exhibits significant subregularities (Köpcke 1988, Embick and Halle 2005), a pattern typical of 'soft' tendencies in the lexicon. In this talk, I show that the different arbitrary classes of roots and affixes postulated in morphological approaches such as Wurzel (1970) can be substantially simplified if they are reinterpreted purely phonologically as containing different amounts of floating vocalic features along the lines of Lieber (1987, 1992) and Wiese (1994, 1996). Combining different morphemes containing floating material leads to a gang effect for featural faithfulness constraints in Harmonic Grammar (Pater 2009). Umlaut thus provides a new type of evidence for cumulative effects involving only faithfulness constraints (Farris-Trimble 2008, Jesney 2015). **Data:** The basic empirical observation is that there are two classes of umlaut-inducing affixes, 'umlaut-enforcing' affixes as the diminutive suffix *-lein* which induces umlaut in virtually every stem and 'umlaut-triggering' affixes as adjectivizing *-lich* that do so only with specific stems, which in turn leads to a corresponding partition of stems in 'umlaut-prone' ones that exhibit umlaut before all umlaut-triggering affixes such as *Arzt* 'doctor' and 'umlaut-reluctant' stems such as *Amt* 'office' that only umlaut before umlaut-enforcing affixes.

	U-enforcing Affix	U-triggering Affix
U-prone Stem	Ärzt-lein	ärztlich
U-reluctant Stem	Ämt-lein	amt-lich

Analysis: Wurzel (1970) encodes these classes by diacritic morphological features, where appropriate combinations of feature values trigger word formation rules executing actual umlaut. I propose to capture Wurzel's original insights by encoding the propensity of morphemes to participate in umlaut by floating [-b(ack)] features on stems *and* affixes reconciling the positions of Lieber (1992) and Wiese (1996). U-prone stems and U-triggering affixes have one floating [-b] feature, umlaut-enforcing affixes two, and U-reluctant stems lack floating [-b]. Assigning to the constraint IDENT [back] (protecting underlying backness of segments) a weight higher than that of MAX [back] (which only applies to floating features, cf. MAX FLOAT in Wolf 2005, 2007), but lower than its multiples, predicts that a single floating [–back] is too weak to lead to realization (a), but any morpheme combination involving more than one instance of [-back] leads to overwriting since a single violation of IDENT allows to avoid multiple MAX violations which effectively cumulate (b,c,d) (affix material in blue).

a. **amt-lich Input: = b.**	ID[b] w=1.5	Mx [b] w=1	H
i. ‡̀ +b -b -b	-1		-1.5
☞ ii. +b -b -b		-1	-1

b. **ärzt-lich Input: = b.**	ID[b] w=1.5	Mx [b] w=1	H
☞ i. ‡ +b -b -b -b	-1		-1.5
ii. +b -b -b -b		-2	-2

c. **Ämt-lein Input: = b.**	ID[b] w=1.5	Mx [b] w=1	H
☞ i. ‡ +b -b -b -b	-1		-1.5
ii. +b -b -b -b		-2	-2

d. **Ärzt-lein Input: = b.**	ID[b] w=1.5	Mx [b] w=1	H
☞ i. ‡ +b -b -b -b -b	-1		-1.5
ii. +b -b -b -b -b		-3	-3

Finally I show that more complex differentiation between floating features and weights also allows to derive finer distinctions between morphological patterns capturing implicational relations

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