

*Umlaut is Phonological
Evidence from Ineffability*

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Goal

- We argue that umlaut is a phonological process (in Limburgian).
- Specifically, it is a case of Spreading induced by a Licensing requirement.
- Evidence comes from ineffability effects.

Umlaut is phonological

Phonology or morphology

Limburgian diminutive umlaut

A phonological analysis

Umlaut: phonology or morphology


- (*i*-)Umlaut is an alternation of stem vowels in certain morphological contexts
- changing a back vowel to a front vowel
- Example (from German): Hund [hunt] ‘dog’ → Hündchen [hyntʰən] (dim.)
- It is believed by many authors that (German) umlaut is “Morpholexical all the way down from OHG through NHG” (Janda)

Possible OT approaches

- Within OT, a morphological approach can take roughly one of two shapes:
 - Anti-faithfulness: A stem back vowel has to change in morphological context x
 - Special markedness: Front vowels are preferred in morphological context x
- A phonological approach can be based on (autosegmental) forces of spreading etc.


Sample morphological analysis

- $*[+BACK]_{Dim}$: No back vowels in the diminutive

hund+dim	$*[+BACK]_{Dim}$	IDENT-[back]
a.  hyntxən		*
b. huntxən	*!	

Sample phonological analysis

- *FLOAT: No floating features

hund+dim	*FLOAT	IDENT-[back]
a.  hyntxən		*
b. huntxən	*!	

Underlyingly front vowels

- If the stem has an underlying front vowel, we do not see umlaut (Kind ‘child’ → Kindchen)
- This provides us with a potential difference between the two types of analysis:
- Under the morphological analysis, the stem already satisfies $*[+BACK]_{Dim}$ underlyingly, hence the winner is ‘perfect’ (satisfies both faithfulness and markedness)
- Under the phonological analysis, *FLOAT may still require satisfaction: either the frontness of the vowel in *Kindchen* stems from the umlaut factor (violating IDENT) or from the stem (violating *FLOAT)
- So far, this theoretical difference has not been tested empirically

Limburgian diminutive umlaut

- Limburgian is a group of West-Germanic dialects spoken in the Netherlands and Flanders
- In these dialects, umlaut applies regularly in two environments:
 - If the plural has no overt ending, then it has an umlauting effect.
 - The diminutive

The plural without overt suffix

Singular

b[u]k

‘billy goat’

b[o:]k

‘book’

k[ɔ]p

‘head’

m[ɑ]n

‘man’

z[ɔu]m

‘hem’

Plural

b[y]k

b[ø]k

k[œ]p

m[æ]n

z[œy]m

More data can be found on the handout

The diminutive

		Diminutive
v[u:]s	'fist'	v[y:]s-ke
b[o:]k	'book'	b[ø:]k-ske
k[ɔ]p	'head'	k[œ]p-ke
m[a]n	'man'	m[æ]n-ke
b[ɔu]m	'tree'	b[œy]m-ke

Other morphological contexts: no umlaut

sl[u:]t	'to close'		sl[u:]ting	'closing'
k[ɔ:]j	'cold, N'		k[ɔ:]jelik	'chilly'
bezw[ɔ:]r	'drawback'		bezw[ɔ:]rlik	'inconvenient'
br[u:]n	'brown'		br[u:]nig	'brownish'
[kʊfi]	'coffee'			

- This can be seen as an argument in favour of a morphological approach

Umlauting can skip a schwa

kl[uə]ster	‘cloister’	kl[yə]ster-ke
compj[u:]ter	‘computer’	compj[y:]ter-ke
m[o:]der	‘mother’	m[ø:]der-ke
[ɑ]nker	‘anchor’	[æ]nker-ke

The umlauted vowel must be stressed

We only find umlaut if the final full vowel is stressed:

kant[uə]r	'office'		kant[yə]r-ke
CD-r[ɔ]m	'CD rom'		CD-r[œ]m-ke
kan[a:]l	'channel'		kan[ɛ:]l-ke
matr[ɑ]s	'mattress'		matr[æ]s-ke

Words without a diminutive

j[u:]d[a]s	‘rotter’
p[u]m[a]	‘puma’
h[o:]m[o]	‘gay person’
[o:]m[a]	‘grandma’
[o:]p[a]	‘grandpa’
k[a]s[a]	‘check-out point’
[o:]per[a]	‘opera’
c[a:]mer[a]	‘camera’

This gap has also been observed for German by a number of authors; e.g. Fanselow and Féry 2003

No solution: ineffability

A	B	C	D
*j[u:]d[æ]s-ke	*j[y:]d[æ]s-ke	*j[y:]d[a]s-ke	*j[u:]d[a]s-ke
*p[u]m[ɛ]-ke	*p[y]m[ɛ]-ke	*p[y]m[a]-ke	*p[u]m[a]-ke
*h[o:]m[ø]-ke	*h[ø:]m[ø]-ke	*h[ø:]m[o]-ke	*h[o:]m[o]-ke
*[o:]m[ɛ]-ke	*[ø:]m[ɛ]-ke	*[ø:]m[a]-ke	*[o:]m[a]-ke
*[o:]p[ɛ]-ke	*[ø:]p[ɛ]-ke	*[ø:]p[a]-ke	*[o:]p[a]-ke
*k[a]s[ɛ]-ke	*k[æ]s[ɛ]-ke	*k[æ]s[a]-ke	*k[æ]s[a]-ke
*[o:]per[ɛ]-ke	*[ø:]per[ɛ]-ke	*[ø:]per[a]-ke	*[o:]per[a]-ke
*k[a:]mer[ɛ]-ke	*k[ɛ:]mer[ɛ]-ke	*k[ɛ:]mer[a]-ke	*k[a:]mer[a]-ke

Ineffability also holds for underlying front vowels!

z[e:]br[a]	'zebra'	*z[e:]br[ɛ]-ke	*z[e:]br[a]-ke
T[i:]n[a]	girl's name	*T[i:]n[ɛ]-ke	*T[i:]n[a]-ke
t[y]b[a]	'tuba'	*t[y]b[ɛ]-ke	*t[y]b[a]-ke
t[y]m[ɔ]r	'tumour'	*t[y]m[œ]r-ke	*t[y]m[ɔ]r-ke

And for front+front combinations!

pos[i]s[i]	‘position’	*pos[i]s[i]-ke
z[e:]n[y]w	‘nerves’	*z[e:]n[y]w-ke
p[e:]n[i]s	‘penis’	*p[e:]n[i]s-ke

And for back + front combinations!

kan[a:]r[i]	kind of bird	*kan[ɛ:]r[i]-ke	*kan[a:]r[i]-ke
red[ɑ]ks[i]	'ed. board'	*red[æ]ks[i]-ke	*red[ɑ]ks[i]-ke
clit[o:]r[i]s	'clitoris'	*clit[ø:]r[i]s-ke	*clit[o:]r[i]s-ke

The only solution is codeshifting (to Dutch)

j[u:]d[a]s-je

z[e:]br[a]-tje

pos[i]s[i]-tje

h[o:]m[o]-tje

sj[e:]m[a]-tje

p[e:]n[i]s-je

[o:]per[a]-tje

t[y]b[a]-tje

clit[o:]r[i]s-je

c[a:]mer[a]-tje

t[y]m[ɔ]r-tje

First problem (of two)

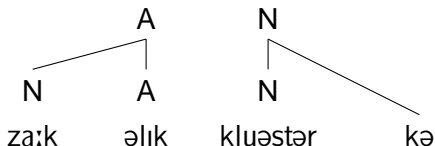
- In Limburg, umlaut targets stress. So the relevant morphological constraint should say:
 - *[-BACK]_{Dim}: No back vowels in stressed position in the diminutive
 - Now, it is difficult to see how non-local umlaut can be blocked. What excludes forms like *j[y:]d[a]s-ke.
- This holds true in particular for morphological approaches of the antifaithfulness flavour

Second problem

- The fact that *zebra*, *positie*, *kanarie* do not have a diminutive just like *oma* shows that something happens to front vowels in umlaut context just like to back vowels
- This fact has so far not been observed in the literature
- However, it is very damaging to a morphological approach, because in such approaches nothing happens to underlying front vowels
- This holds true in particular for morphological approaches of the specific-markedness flavour
- We now proceed to present a phonological account

A phonological analysis

- We assume that morphemes are not constraints, but structure
- Diminutives are similar to inflectional suffixes in that they are not morphological heads. Real derivational affixes are heads.



Predecessors working with rules are Bach and King (1970), and also Ross (1967). We also borrow from autosegmental approaches based on floating features: Hamans (1985), Lieber (1987, 1992), Wiese (1987, 1996ab), Yu (1992), Lodge (1989), Rennison (1989), Fery (1994).

Phonology- morphology mapping

- Vowels in the adjoined position (inflectional suffixes) are structurally poor (schwa = featureless vowel). This is also true for the diminutive.
- The adjoined position deprives a nuclear head of its licensing capacity. Accordingly, a Place Node is not licensed when it is located in the adjoined position. (Consequently, only a schwa can be located in the adjoined position).

Why only diminutives and flexion show umlaut

- The only strong argument for a morphological analysis seemed to come from the fact that umlaut only happens for some morphemes
- However, a Place Node located in a derivational affix is nicely licensed.
- The same is true for the Place nodes located in roots (underived environments).
- This explains why there is no umlaut in any of the derivational affixes listed before, and why there is no umlaut in underived environments.
- We thus actually have a more principled explanation of why umlaut happens in the contexts where it does

Licensing the Coronal feature

- LICENSE-[Cor]: Coronal must be licensed
- Licensing cannot happen in the diminutive, because this is an ajoined position
- Therefore Cor has to spread towards the stem
- Schwa can be (should be) skipped, because it does not have a Place node
- Why must Coronal spread to the stressed vowel?
- HEAD=HEAD: The head of a harmonic span should be the head of a foot.

See McCarthy 2004 for span theory.

Binarity

- Why must the stressed vowel be adjacent to the diminutive suffix?
- BINSPAN: A feature span is (maximally) binary.
- BINSPAN explains why an umlauted vowel in the stressed syllable is adjacent to the diminutive suffix. Recall *j[y]d[ɛ]s-ke.
- Intervening vowels (other than schwa) cannot be skipped, because they do have place nodes. Recall *j[y]d[ɑ]s-ke.
- A vowel's underlying quality does not matter. Recall *z[e]br[ɛ]-ke, *z[e]br[a]-ke; *pos[i]s[i]-ke, etc.

See Topintzi & Van Oostendorp 2008 for evidence for BINSPAN from Greek and other languages.

Ineffability

- Ineffability is a classic puzzle for OT; there are various alternative solutions available
- It is not very relevant for us which solution is chosen
- For our present purposes, we will keep to the solution of Prince & Smolensky (1993/2004): there is one so-called ‘null-parse’ (\emptyset), satisfying all markedness constraints but violating a constraint MPARSE.

See Wolf and McCarthy forthcoming for a more recent implementation of this mechanism.

Conclusion

- We have provided some new arguments in the ongoing debate on the status of umlaut in West-Germanic
- In particular, we have provided evidence that roots with underlying front vowels are also sensitive to some ‘change’ as a result of umlaut
- This is difficult to account for in a morphological approach, since there it would seem that underlying front vowels don’t need to change (or are blocked from changing)
- We have in this way demonstrated that forms which cannot be pronounced can give us information about the structure of words which can be