

Ablaut and Umlaut

What they have in common, what distinguishes them.

Elisabeth Rieder & Anita Schenner

The aim of this paper is to discuss the main properties of New High German Ablaut and Umlaut in the light of concepts that were recently developed within the framework of Government Phonology. It will be shown that Ablaut and Umlaut, although both are instances of process morphology, can not be viewed as the same phenomenon.

1. Introduction

New High German (henceforth NHG) Ablaut and Umlaut are both morphophonological processes. Both are realized on the surface as vowel alternations. Both have a grammatical function. Nevertheless, it is assumed that Ablaut and Umlaut are different grammatical tools. In this paper we will take a closer look at various synchronic properties of the two processes and investigate which characteristics they share and which not.

The theoretical framework for the following analysis is Government Phonology (Harris & Lindsay 1995, Kaye, Lowenstamm & Vergnaud 1985, 1990) under the strict CV-skeleton hypothesis (Lowenstamm 1996).

The paper is organized as follows: in section 2 we are going to give an overview of recent theoretical developments concerning Ablaut phenomena from a universal perspective and the implications for the theory of NHG Ablaut. In section 3 a synchronic analysis of NHG Umlaut is presented. For a thorough understanding of the mechanism at work also a short diachronic background is provided. Section 4 concludes the paper. It recapitulates the main characteristics of Ablaut and Umlaut and gives an account of their relevant differences and similarities.

2. Ablaut

Ablaut is viewed here, put briefly, as a context-free non-arbitrary vowel alternation with grammatically distinctive character.

As was already noted by Kuryłowicz (1956, 1968), Ablaut is a derivational process: the apophonically derived form is a non-arbitrary output. But whereas Kuryłowicz acknowledges the derivational link between two forms related by apophony, he does not postulate any restriction on the possible set of vowel pairs that can be in an apophonic relation. Such a restriction to the possible vocalic participants in apophony exists in recent approaches to apophony (Bendjaballah 1995, 1999, Guerssel & Lowenstamm 1993, 1996, Ségéral & Scheer 1998). Furthermore a universally valid regularity is postulated. This non-arbitrariness or regularity of the morphophonological alternation in question is captured in the so-called Apophonic Path.

2.1. The Apophonic Path

Originally, the Apophonic Path was formulated by Guerssel & Lowenstamm (1993, 1996) to account for vowel alternations that occur in Classical Arabic (henceforth CA) verbal morphology.

(1) CA Measure I¹

| Root | Active Perfective | Active Imperfective | Gloss | Alternation |
|------|-------------------|---------------------|----------|-------------|
| Drb | Dar <u>a</u> b-a | ya-Dri <u>b</u> -u | 'beat' | a ~ i |
| lbs | lab <u>i</u> s-a | ya-lba <u>s</u> -u | 'clothe' | i ~ a |
| ktb | kata <u>b</u> -a | ya-ktu <u>b</u> -u | 'write' | a ~ u |
| kbr | kabu <u>r</u> -a | ya-kbu <u>r</u> -u | 'grow' | u ~ u |

As can be seen in (1), CA apophony seems to be a rather opaque system. Input *a* yields output *i* and input *i* output *a* (called 'polarity' by Guerssel & Lowenstamm) irrespective of whether one takes the perfective or the imperfective forms as the base form. Furthermore one and the same input can have two different outputs, that is input *a* can have output *i* and *u*, assuming that the direction of derivation is perfective to imperfective, or input *u* can have output *a* and *u*, assuming the opposite direction of derivation, imperfective to perfective ('opacity').

Guerssel & Lowenstamm stipulate the existence of another underlying vocalic element in CA apart from the three surface vowels [a, i, u]. This fourth vocalic element is the null set *0*. Two assumptions make the apophonic system of CA transparent. The form *Daraba* carries this underlying *0*, which on the surface is filled by propagation of the vowel to its left. The

¹ Examples are quoted in their 3rd person masculine singular forms.

imperfective, the morphologically more complex form, is derived from the perfective.

(2)

| <i>Root</i> | <i>Active Perfective</i> | <i>Active Imperfective</i> | <i>Gloss</i> | <i>Alternation</i> |
|-------------|--------------------------|----------------------------|--------------|--------------------|
| Drb | Dar ḡ b-a | ya-Dr i b-u | 'beat' | 0 ~ i |
| lbs | lab i s-a | ya-lb a s-u | 'clothe' | i ~ a |
| ktb | kat a b-a | ya-kt u b-u | 'write' | a ~ u |
| kbr | kab u r-a | ya-kb u r-u | 'grow' | u ~ u |

Input *0* yields output *i*, input *i* output *a*, input *a* output *u* and input *u* output *u*. This series of alternations can be represented as an apophonic path:

(3) Apophonic Path: $0 \rightarrow I \rightarrow A \rightarrow U \rightarrow U$

With the formal instrument of the Apophonic Path, the derived vowel is predictable without any ambiguity from the source vowel, i.e. only the source vowel is a lexical entry. It is concerned with alternations of quality only, traditionally termed 'qualitative Ablaut' in Indo-European studies. Alternations in quantity, traditionally termed 'quantitative Ablaut', are not considered to be of an apophonic origin in this framework.

The apophonic path is crosslinguistically unique. It proved to be a valuable instrument for analyzing morphologically conditioned vowel alternations in such diverse languages as e.g. Kabyle Berber (Bendjaballah 1995, 2001), Beja (Bendjaballah 1999), Nepali (Boyé 1996), French and Spanish (Boyé 2000).

2.2. Ablaut in New High German

Ségéral & Scheer (1998) applied the Apophonic Path to one of the most well-known apophonic systems, that of German strong verbs.

The stem vowel of NHG strong verbs alternates in different morphological categories. This morphophonological alternation is supposed to date back to proto-Indoeuropean times. Ablaut is not a productive process in NHG. NHG strong verbs constitute a closed class with about 170 members. Ségéral & Scheer's analysis of NHG Ablaut is carried out on a purely synchronic level.

(4) Examples of NHG strong verbs²

| <i>Present</i> | <i>Preterite</i> | <i>Past Participle</i> | <i>Gloss</i> | <i>Surface Alternation</i> |
|----------------|------------------|------------------------|--------------|----------------------------|
| | | | | <i>s</i> |

² Here only examples of Ablaut classes are quoted which can be analyzed rather straightforwardly. For the analysis of the more obstinate cases, cf. Ségéral & Scheer (1998).

| | | | | |
|--------------------|------------------|----------------------|--------|-----------|
| s <u>in</u> gen | s <u>a</u> ng | ges <u>u</u> ngen | 'sing' | i ~ a ~ u |
| schw <u>i</u> mmen | schw <u>a</u> mm | geschw <u>o</u> mmen | 'swim' | i ~ a ~ o |
| bi <u>e</u> gen | bo <u>g</u> | geb <u>o</u> gen | 'bend' | i ~ o ~ o |
| he <u>l</u> fen | ha <u>l</u> f | geh <u>o</u> lfen | 'help' | e ~ a ~ o |
| me <u>l</u> ken | mo <u>l</u> k | gem <u>o</u> lken | 'milk' | e ~ o ~ o |

As can be seen in table (4), the complex vowel system of NHG calls for a theoretical extension to the apophonic theory presented in the previous section. A complex segment like [e] or [o] consists of two fused elements, *A.I* and *A.U* respectively. It has to be clear which part of a complex vowel participates in an apophonic operation. Ségéral & Scheer (1998) propose a distinction between possible entering elements and parasitic elements. An entering element is the input to the first step of an apophonic derivation, i.e. the lexically recorded source vowel, whereas a parasitic element is an element that 'contaminates' the participant of the apophonic operation on the surface. This parasitic element is of a non-apophonic origin, e.g. an Umlaut process etc.. An entering element cannot be a parasitic element and vice versa, that is entering and parasitic elements are in complementary distribution.

A and *U* are parasitic elements in NHG which leaves only *O* and *I* as possible entering elements. In the present both *A* and *U* occur as parasitic elements. In the preterite only *U* occurs, due to an *U*-containing consonantal environment. In the past participle only *A* occurs, due to a historical vowel harmony process, namely *A*-Brechung.

In the light of the considerations above the alternations in (4) can be analyzed as being instances of only one underlying alternation, $I \rightarrow A \rightarrow U$.

(5)

| <i>Present</i> | <i>Preterite</i> | <i>Past Participle</i> | <i>Gloss</i> | <i>Underlying Alternation</i> |
|--------------------|------------------|------------------------|--------------|-------------------------------|
| | | | | ^s |
| s <u>in</u> gen | s <u>a</u> ng | ges <u>u</u> ngen | 'sing' | I ~ A ~ U |
| schw <u>i</u> mmen | schw <u>a</u> mm | geschw <u>o</u> mmen | 'swim' | I ~ A ~ U |
| bi <u>e</u> gen | bo <u>g</u> | geb <u>o</u> gen | 'bend' | I ~ A ~ U |
| he <u>l</u> fen | ha <u>l</u> f | geh <u>o</u> lfen | 'help' | I ~ A ~ U |
| me <u>l</u> ken | mo <u>l</u> k | gem <u>o</u> lken | 'milk' | I ~ A ~ U |

The application of the Apophonic Path to the system of NHG strong verbs shows that even in this non-productive system only the present form is lexically recorded. The other forms are derived according to the Apophonic Path.

3. Umlaut

Another phenomenon of vowel alternations in NHG is Umlaut. NHG Umlaut occurs in different environments, only in some of them regularly. Derivational as well as inflectional processes are potential environments for umlaut to

surface. (6) lists derivational processes involving umlaut in NHG, (7) inflectional ones:

(6)³

| <i>Affix</i> | <i>Process</i> | <i>Base</i> | <i>Derivation</i> | <i>Gloss</i> |
|--------------|-------------------|-------------|-------------------|------------------------------------|
| -chen | N > N(diminutive) | Haus | Häuschen | 'house' > 'little house' |
| -lein | N > N(diminutive) | Mann | Männlein | 'man' > 'little man' |
| -ling | N/A > N(m) | dumm | Dümmling | 'stupid' > 'stupid chap' |
| -erich | N(f) > N(m) | Gans | Gänserich | 'goose' > 'gander' |
| -e | A > N(abstract) | gut | Güte | 'good' > 'goodness' |
| Ge- | N/V > N(mass) | Strauch | Gesträuch | 'bush' > 'bushes' |
| -in | N(m) > N(f) | Hund | Hündin | 'dog' > 'bitch' |
| -er | V > N(agent) | backen | Bäcker | 'bake' > 'baker' |
| -lich | N/V/A > A | Mann | männlich | 'man' > 'manly' |
| -ig | N/V/A > A | Wasser | wässrig | 'water' > 'watery' |
| -isch | N/V/A > A | Hohn | höhnisch | 'scorn' > 'scornful' |
| -eln | N/V > V | Zunge | züngeln | 'tongue' > 'to let its tongue out' |
| -ern | V/A > V | rauchen | räuchern | 'smoke' > 'smoke, fumigate' |

(7)

| <i>Affix</i> | <i>Process</i> | <i>Base</i> | <i>Inflection</i> | <i>Gloss</i> |
|---|----------------|-------------|--------------------|---------------------------------|
| -er | N(sg) > N(pl) | Haus | Häuser | 'man' > 'men' |
| -e | N(sg) > N(pl) | Sau | Säue | 'pig' > 'pigs' |
| comparative and superlative forms of A | | groß | größer grössten | 'big' > 'bigger' > 'biggest' |
| subjunctive II of strong V | | schwamm | schwämme | 'swam' > 'swam' |

Historically umlaut was a phonological process. In Old High German suffixes containing palatal segments caused assimilation of the base-vowels they attached to. The vowels [a], [o] and [u] turned into their umlauted versions [e], [oe] and [ue] - back vowels became front ones. This was a regular and productive process as long as suffixes still bore secondary stress. But in the course of time, the stress patterns of German changed. Suffixes lost their ability to bear stress which resulted in the lenition of the suffix vowels. This so-called "Schwaisierung" went hand in hand with the morphologisation

³ N (noun), V (verb), A (adjective), m (masculine), f (feminine), sg (singular), pl (plural).

of the umlaut process. Umlaut was no longer triggered by once palatal suffixes directly, but occurred in specific morphological environments (at first still depending on the simultaneous occurrence of once umlaut triggering suffixes) or took place by analogy. Still, only one vowel of the base was affected, the main stressed one. In NHG only some suffixes have productive status with respect to umlaut formation. Diminutive formation of nouns via the attachment of *-chen* or *-lein* is nearly always accompanied by Umlaut of the stem vowel. But in general, the once phonological operation has lost its productive status with the continued morphologisation.

In NHG, umlaut is caused by morphological or syntactic environments. The alternation of the base vowel can still be analyzed phonologically: in autosegmental terms, a floating element *I* is the phonological trigger at Deep Structure which, added to the vocalic segments [a, u, o] of the base, derives their umlauted versions [ae, y, oe].

| | | |
|---------|------|----------------------|
| (8) <ä> | [ae] | A . I |
| <ü> | [y] | U . I |
| <ö> | [oe] | [o] ⁴ . I |

Umlaut can be analyzed as part of a universal process called mutation (cf. Lieber 1987). Mutations, by definition, are local processes. No spreading rules⁵ apply. Only one element is affected by the mutation process. Floating elements (or features) on an autonomous tier are triggers of the mutation process. For NHG umlaut, the phonological element *I* serves as trigger, the affected element is the main stressed element of the base.

Though locality is universally claimed for mutation processes and NHG umlaut perfectly fits into this frame, we would rather claim that locality or non-locality is defined as a language specific parameter. There are various languages where umlaut is not strictly local⁶ but still behaves well with respect to other main characteristics of universal mutation processes.

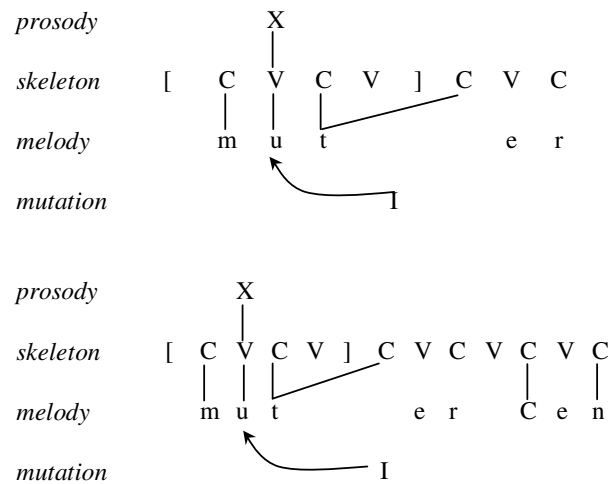
- (9) Representation of Sg. *Mutter* 'mother' - Pl. *Mütter* 'mothers', Dim. *Mütterchen* 'little mother':

| | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|
| <i>prosody</i> | | | X | | | | | | |
| | | | | | | | | | |
| <i>skeleton</i> | [| C | V | C | V |] | C | V | C |
| | | | | | | | | | |
| <i>melody</i> | | m | u | t | | | e | r | |

⁴ For complex segments cf. section 2.2

⁵ For a definition of spreading (and other autosegmental) rules cf. McCarthy 1979 and also Lieber 1987.

⁶ As was pointed out to us by Jan G.Kooij (personal communication), in Roermond (a Dutch variant in the area of Limburg), umlaut can affect more than one vowel in the stem. The ending *-ke* in the following examples is the diminutive suffixes which productively triggers umlaut of stem vowels: e.g. *piano* > *piaeneuke*, *kano* > *kaeneuke*.



Several autonomous tiers interact simultaneously in the above representations. The phonological segments of bases and suffixes reside on the melody-tier. They are associated with C and V positions of the skeleton tier. Prosodically prominent segments associate with markers (X in the representation above) at the prosody-tier. A fully specified (associated) skeletal string is input for the phonetic output (or spell-out) and results in a pronounceable sequence of a language L. Umlaut in NHG is a morphological process. The floating *I* resides on a separate morphological tier, the mutation-tier. In specific derivational and inflectional environments it is activated and associates to the prosodically most prominent vocalic segment at the skeletal level. *A*, *U* and the complex segment [o] are potential candidates for Umlaut in NHG. The addition of an *I* element leads to their respective umlauted versions, as explained above. Non-associated material of the melody-tier is realized as schwa or oppressed completely at the phonetic level.⁷

4. Ablaut and Umlaut

As was shown in the sections above, Ablaut is a derivational process that lacks any contextual conditioning, i.e. there is no phonological trigger for the

⁷ For a detailed account of the representation of NHG Umlaut, cf. Rieder (2000).

apophonic derivation. There is one, and only one, universally valid regularity, the Apophonic path, according to which apophonic alternations can take place.

Umlaut in derivational and inflectional word formation is represented as an autonomous morpheme, the floating element *I*. This phonological trigger fuses with the main-stressed vocalic segment of the base which results in the various umlauted versions of the base vowels.

The major difference between Ablaut and Umlaut is that Umlaut involves a floating element, whereas Ablaut does not. This floating element, *I*, is in itself the phonological trigger as well as part of the surface form of the derivational output. Put differently, input *I* is present in the output as *I*. In Ablaut on the other hand, the input element is replaced by the respective output element. If Ablaut were achieved by a floating element, a parallel behaviour of the triggering elements in both processes would be expected, but such a parallel behaviour is clearly not the case in NHG.

The formation of the subjunctive of NHG strong verbs illustrates this case:

(10)

| <i>Present</i> | <i>Preterite</i> | <i>Subjunctive</i> | <i>Gloss</i> | <i>Surface Alternation</i> |
|--------------------|------------------|--------------------|--------------|--------------------------------|
| | | | | <i>s</i> |
| s <u>i</u> ngen | s <u>a</u> ng | s <u>ä</u> nge | 'sing' | i ~ a ~ ä |
| schw <u>i</u> mmen | schw <u>a</u> mm | schw <u>ä</u> mmen | 'swim' | i ~ a ~ ä |
| m <u>e</u> lken | m <u>o</u> lk | m <u>ö</u> lke | 'milk' | e ~ o ~ ö |

In the derivation of the preterite forms from the present, the apophonic source vowel, *i* and *e* in (10), transforms into its apophonic output *a* respective *o*. By contrast the relation between the preterite forms and the subjunctive clearly shows that the base vowel mutates. The alternations *a* ~ *ä* and *o* ~ *ö* are results of fusion operations with the floating element *I*. As can be seen, in Umlaut the source vowel is part of the derived vowel, whereas in Ablaut the source vowel is not.

To sum up, NHG Ablaut and Umlaut are both instances of process morphology, but there are different mechanisms at work.

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