A BRIEF PAPER ON GERMAN UMLAUT[1]

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In memory of Emmon Bach

1 Introduction

In this paper, an attempt is made at making sense of German Umlaut in a framework where the pieces of words are put together by the same mechanisms as put together the pieces of sentences (Borer 2005, Embick & Marantz 2008 and references therein). Efforts conducted along such lines are easily recognizable by the use of characteristic devices: roots, categorizing heads, movement, probes, goals, etc. In this introduction, I would like to draw attention to something more general and fundamental.

When we talk about sentences, we ask whether they are 'good' (meaning grammatical) or 'bad' (meaning ungrammatical, deviant). We never ask whether sentences 'exist' or whether we 'know' them. But when we talk about words, we ask just those questions: does this word 'exist'? Do you 'know' that word?

What would it mean to be able to answer that last question? Does it mean that for any word, we should be able to positively say whether it exists or does not exist? How could this be done? Is *precisionism* a word of English? Who decides?

I conducted a modest experiment with 22 native speakers of English (citizens of the UK, the USA, Canada, Australia, India). I asked them whether *atramentous* is a word of English and whether they could assign it to a specific part of speech. All admitted to not knowing *atramentous* (meaning 'ink like, black as ink') though all agreed that if such a word existed it would have to be an adjective. Then, I asked them whether *neuronic* and *neuronous* were English words. Not only was the rejection unanimous, the answer was offered in almost dogmatic fashion, "No! *neuronal* is the word!!!". But I forcefully insisted that, in addition to *neuronal,* neuroscientists routinely use both *neuronic* (true) and *neuronous* (false) for distinct purposes. My assertion was accepted as true without discussion.

I believe this shows two things:

1. We have no idea what words exist beyond the words we already know.

2. We will accept any new noun, adjective or verb the moment we are told it matches something in the world, p*rovided that new word is well-formed.*

I conclude that asking whether a noun, adjective or verb exists is no more meaningful than asking whether a sentence exists. The important question for a syntactic theory of word formation is whether an item conforms with the general pattern of the language, not whether it is listed in popular or scholarly dictionaries, or even part of the vocabulary of speakers in everyday life or on the workplace.[2]

The relevance of these commonplace remarks will soon become clear.

2   Overview and Issues

German Umlaut has been extensively described and discussed in the literature, and no attempt will be made here to provide a new or exhaustive description of the phenomenon.[3] On the contrary, the operation of Umlaut will be very parsimoniously illustrated in this paper, just enough to allow the reader unfamiliar with the relevant data to form an opinion on the proposal developed therein. Suffice it to say that under specific circumstances, a suffix can cause the fronting of a back vowel or diphthong in the stem of its complement. This is illustrated in (1).[4]

(1)   'Stem'   Suffix   'Stem'+Suffix
                                                                and Umlaut

   Mann   'man'   [man]   +lich Adj]   männlich   'manly'   [mɛnlıç]
   gross 'big'   [gro:s]   +erComparative]   grösser   'bigger'   [grö:sər]
   Kuh   'cow'   [ku:]   +e Plural]   Kühe   'cows'   [küə]
   Haus   'house'   [haws]   +erPlural]   Häuser   'houses'   [hɔyzər]

I submit that all the suffixes in (1) cause Umlaut by virtue of being endowed with a floating prosody noted 'I', as in (2).

(2)   <<< I

                    +lich ₐdⱼ]

The suffixes of German fall into three categories with respect to Umlaut:

   a)   some always trigger Umlaut
   b)   some trigger Umlaut, but unpredictably
   c)   some never trigger Umlaut

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[2] Thus, *gloriosity* (of blocking fame, cf. Embick & Marantz (2008)) is a perfectly fine English word. Whether it matches something in the world is a question about the world, not about grammar.

[3] Similarly, the bibliography of this paper is not meant in any way to do justice to the richness of the literature on German Umlaut beyond Anderson (1986), Bach &King (1970), Féry(1994), Klein (2000), Lieber (1980), Lodge (1989), Rennison (1989, 2015), Wiese (1987, 1996a, 1996b), Wurzel (1984), Yu (1992), Zwicky (1967)

[4] /aw/ and /a/ are eventually realized as [ɔy] and [ɛ], respectively.In the remainder of this paper, the German data will be quoted according to the orthographic conventions of the language.

The first type can be exemplified by plural marker +*er*. If *Xer* is the plural of *X*, the rightmost vowel of *X* in *Xer* (other than schwa) is always a front vowel. An example appears in (3).

(3) Rad 'wheel'   Räder 'wheels'

The second type, the sporadic umlauters, will be exemplified by one single example, adjective forming +*lich*. Its puzzling behavior can be observed in (4), where +*lich* umlauts the stem vowel of the first noun, but not of the second.

(4) Mann 'man'   männlich 'manly'
     Amt 'government office'   amtlich 'official'

Note that no special privilege immunizes *Amt* against Umlaut. On the contrary, both *Amt* and *Mann* form +*er* plurals of the type exemplified in (3) above, and *both* plurals (not just the plural of *Mann*) display Umlaut. This is shown in (5).

(5) Singular   Plural

     Amt   Ämter
     Mann   Männer

Finally, the third type includes suffixes such as e.g.+*bar* (ex. *kostbar* 'precious') or +*schaft* (ex. *Verwandschaft* 'kinship') which never cause Umlaut. There is very little to say about those, except they just do not have the relevant Umlaut-triggering property shown in (2).

Clearly, the sporadic umlauters such as +*lich* offer a challenge of the most vexing type: when they will, or will not cause Umlaut appears to be entirely unpredictable.[5] This unpredictability has led some students of German word formation to conclude that further investigation of the synchronic status of Umlaut was basically pointless.[6]

Recently, Jonathan Kaye and Markus Pöchtrager have forcefully argued that Umlaut cannot possibly be phonological (Kaye 2015, Pöchtrager 2014). One of the points they make is as in (6).

(6) i. rules apply

     ii. evidence such as in (4) and (5) or fn.4 shows that Umlaut is neither phonological nor rule-governed

The idea is that if a process affects *Mann+lich* and returns *männlich*, it should return *ämtlich* when it affects *Amt+lich*. But a crucial assumption underlies this reasoning, viz. +*lich* faces the same configuration when it attaches to *Mann* as when it attaches to *Amt*.

I will argue that nothing forces such an assumption. Specifically, I will argue in support of (7).

(7) The environment for the application of Umlaut was met in the derivation of *männlich*, but not in the case of the derivation of *amtlich*.

In sum, I have no problem with calling German Umlaut non-phonological.[7] I do have a problem with the view that it would have the same status as say, English *man/men*, *foot/feet*,

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[5] Janda (1998) provides a spectacular example: *Busch* 'bush' undergoes Umlaut before Plural marker +*e*, but not before adjectival +*ig* while *Tag* 'day' undergoes no Umlaut before +*e* though it does before +*ig*. Thus, *Busch/Büsche/buschig* vs. *Tag/Tage/tägig*.

[6] W.U. Dressler (p.c.), Janda (1998).See Wiese (1996a,b) for a different view.

[7] Compare German Umlaut and Lowering Harmony in Tigré (Lowenstamm & Prunet, 1998).

etc. The conjecture that English has an active process of Umlaut is entirely implausible partly because of counterevidence such as *book/*beek*, *root/*reet* and the like, but much more importantly because English has no exceptionless Umlauters. German does. Moreover, the number of relevant occurrences of regular and sporadic Umlaut in German is simply enormous. Therefore, I want to explore the possibility that such alternations are grammatically governed, even if non-phonological.

Before I put forth a formal proposal for the expression of (7), I would like to draw attention to two properties of Umlaut which strongly suggest that the phenomenon is not nearly as fortuitous and intractable as might have been surmised from merely considering the contrast between *männlich* and *amtlich*.

Property 1
Umlaut applies under strict structural adjacency. Thus, +*lich* triggers Umlaut on *Vater* 'father', hence *väterlich* 'paternal'. But when *Vater* and +*lich* are separated by an intervening morpheme, say +*schaft* (cf. *Vaterschaft* 'fatherhood'), +*lich* becomes incapable of reaching *Vater*, thus *vaterschaftlich*, not **väterschaftlich*. Failure of +*lich* to umlaut *Vater* in this case is not another instance of its unpredictable behavior. Indeed, no case is attested of +*lich* (or any other Umlauter) reaching a target across an intervening morpheme.

Property 2
Umlaut hits 'low'. That is, its target must be the most deeply embedded object in the morphological representation, thus once more *väterlich* with successful Umlaut. Importantly, 'bottommost' here is not equivalent to 'linearly leftmost'. Indeed, the bottommost object may be complex. Consequently, it should be said, strictly speaking, that Umlaut targets the head of the bottommost object, thus *zweistöckig* 'two-storeyed' from *zwei* 'two' and *Stock* 'storey'; or *tatsächlich* 'actual' from *Tat* 'fact' and *Sache* 'matter, thing'; or *Reichtümer*, the plural of *Reichtum* 'abundance, fortune' from *reich* 'rich' and +*tum* 'dom' (cf. *kingdom*).

Clearly, structural factors play a major role in the description of Umlaut. Unsurprisingly, they are more likely to shed light on what regular and sporadic umlauters share and don't share than the sterile observation that a dichotomy obtains. Now, suppose one asked the question in (8).

(8)   What other property distinguishes sporadic from regular umlauters?

A closer look at the profile of a regular umlauter, plural +*er*, provides the beginning of an answer: +*er* exclusively attaches to unsuffixed complements (cf. *Amt/Ämter*, *Mann/Männer* above). For instance, the respective plurals of *Obrigkeit* 'authorities' (obr-ig-keit) or *Wissenschaft* (wiss-en-schaft) are *Obrigkeiten* and *Wissenschaften*. They could never be **Obrigkeiter* or **Wissenschafter*. This feature causes +*er* to meet the two properties of Umlaut described above: a) the complement of +*er* will always be as low as can be; b) +*er* will always be adjacent to its own complement or to the head of its own complement. I submit that the positional properties of +*er* are directly related to its behavior as an exceptionless umlauter. The strongest version of the connection between such positional properties and umlauting appears in (9iii).

(9)   i.   +er Plural] is endowed with the Umlauting property in (2)

ii. +er Plural] never attaches to a suffix

iii. it follows that +er Plural] is an exceptionless umlauter

If (9iii) is accepted, the behavior of sporadic umlauters can now be construed as in (10).

(10) i. When a sporadic umlauter does trigger Umlaut, it is located in the same position as +er [Plural].

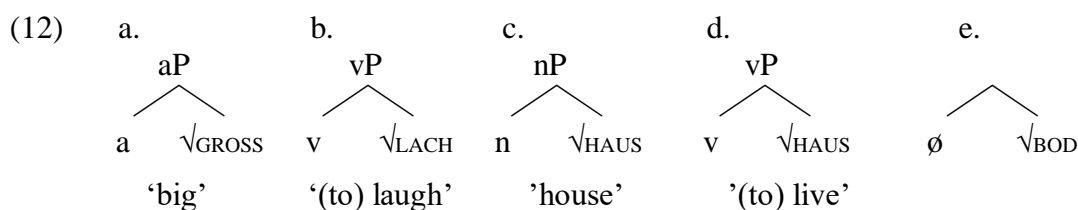ii. When a sporadic umlauter does not trigger Umlaut, it is located in a different position from +er [Plural].

This is schematically represented in (11): in (11a) both +*lich* and +*er* occupy a low position and both trigger Umlaut, viz. *männlich* and *Männer*; in (11b) +*lich* occupies a higher position (inaccessible to +*er*) and causes no Umlaut.

(11)   a.   b.

     lich[Adj]   Mann   lich[Adj]
     er[Plural]   *er[Plural]
                                    schaft   Mann
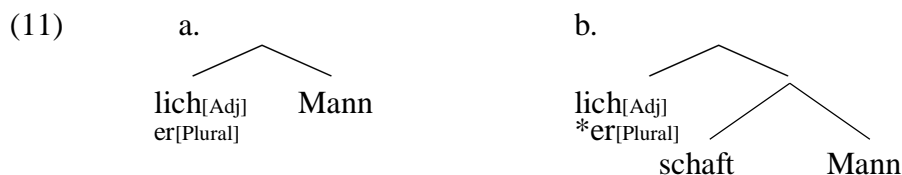
The next section is devoted to the presentation of the theoretical apparatus relevant to the implementation of the view just put forth.

3 Some Tools and a Proposal

Following Borer (2005), Embick (2010), Embick & Marantz (2008) and others, I assume that the grammar of a language involves the presence of two lists. The first list is a list of uncategorized roots. Examples of such roots in the case of German are √GROSS, √LACH, √HAUS, √BOD. Roots acquire categorial membership upon merger with one or more of a set of categorizers, *n* (noun), *v* (verb), or *a* (adjective). Resulting structures are shown in (12).

(12)   a.   b.   c.   d.   e.
      aP   vP   nP   vP
    a √GROSS   v √LACH   n √HAUS   v √HAUS   ø √BOD
     'big'   '(to) laugh' 'house'   '(to) live'

(12a,b) require little comment, as they merely show how roots √GROSS and √LACH merge with *a* and *v* to form adjective *gross* 'big' and verb *lach* '(to) laugh', respectively. (12c,d) show how root √HAUS has merged with both *n* and *v* to form a noun 'house' and a verb 'to live frugally or without any comfort'. Accordingly, *gross*, *lach(en)*, *Haus* and *haus(en)* are recorded in the second list, the list of 'actual words'.[8] Finally, (12e) illustrates a case of selectional inertia: root √BOD has not been selected by a categorizer.[9] As a result, no verb, adjective, or noun *bod* is known to us. Of course, the natural question to ask is: why would we suppose the existence of a root √BOD in the first place if no corresponding 'word' *bod* is recorded in the second list? This interesting question will be returned to momentarily.

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[8] Of course, that second list has no more theoretical status than a list of 'actual' sentences.
[9] It is strictly for graphic clarity that selectional inertia is noted in (12e) as if the root had been selected by a null categorizer. No claim such as can be found in De Belder & v. Craenenbroeck (2011) is intended here.

An important observation made in connection with structures of the type exemplified in (12) is that the first *merge* may or may not give rise to compositional meaning, but further *merges* regularly culminate in compositionality, cf. Embick (2010). To see this, consider the paradigm in (13):

(13) Kunst 'art'   kunst
      künstlich 'artificial'   [[kunst]lich]
      künstlichkeit 'artificialness' [[[kunst]lich]keit]

Typically, the combination of *Kunst* and +*lich* produces an adjective the meaning of which is not necessarily compositional (presumably, compositionality would have derived a meaning akin to that of *artistic*). Non-compositionality, it is argued, can be observed when the relationship between two ingredients is local. By contrast, further *merges* systematically result in compositionality. The meaning of *Künstlichkeit* clearly vindicates the claim.

I part ways with the authors mentioned at the beginning of this section on an important issue, exponence. Most, if not all, students of word formation subscribe to the idea that, by and large, most derivational suffixes are exponents of a grammatical category, its Saussurean *signifiant*. Thus, +*schaft*, +*keit*, +*ung* are exponents of nominality, +*lich*, +*ig*, +*isch* are exponents of adjectivalness, etc., a view forced by all frameworks I am familiar with. But, frameworks countenancing roots and categories offer other options. Here, capitalizing on such options, I draw from Lowenstamm (2015) and propose something completely different from the usual view, viz. (14).

(14) i. suffixes are not categorial exponents

      ii. suffixes are themselves roots

The difference appears in (15) with alternative representations of *männlich*. In (15a), the classical position is represented in the form of a perfect positional fit between the suffix and the category of which it is reputed to be the exponent.[10] In (15b), I have represented the position advocated in this paper: 1) suffix +*lich* is NOT the exponent of category *a*, 2) +*lich* is a root.
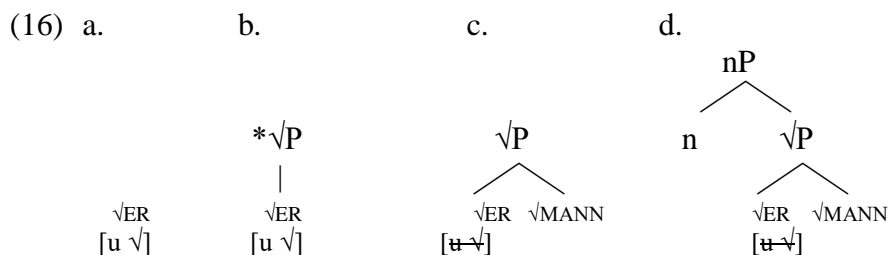
(15)   a.   b.
            aP   aP
           / \   / \
          a   √MANN   a   √P
          ↕   / \
         lich   √LICH   √MANN

Being the received view, (15a) requires little comment. On the other hand, the unusual scheme described in (15b) certainly requires demonstration. The rest of this section is devoted to such a demonstration.[11]

If bound morphemes such as suffixes are roots, they must be 'bound' roots, cf. Selkirk (1982). I propose to represent their boundedness by means of an uninterpretable feature as in (16) with the case of plural +*er*.

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[10] The double-pointed arrow in (15a) is meant to exclusively represent the fit between the affix and the category, regardless of whether the mechanism responsible for bringing about the fit is bottom-up or top-down, cf. Lowenstamm (2015) for discussion.

[11] See Faust (2012) for discussion and development of this idea on the basis of an extensive fragment of Modern Hebrew phonology and morphology.
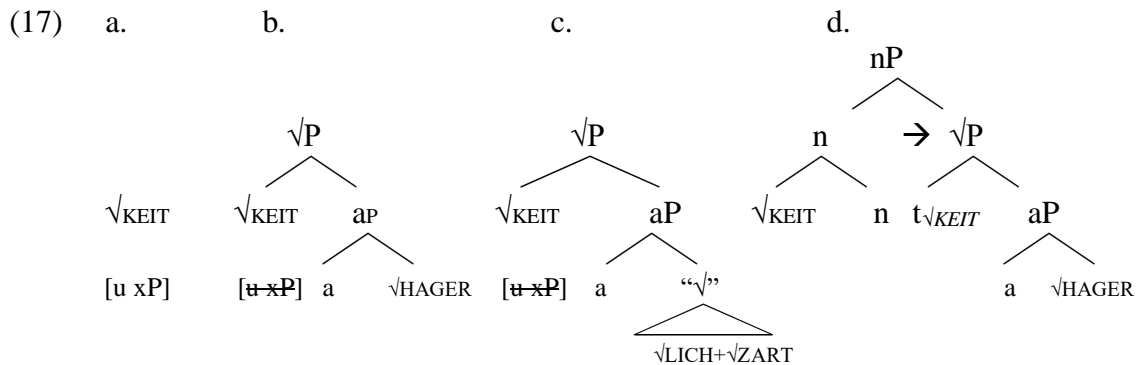
(16) a.   b.   c.   d.

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                                                                          nP
                                                                        /    \
                         *√P              √P                    n       √P
                          |              /  \                          /  \
       √ER             √ER          √ER   √MANN            √ER   √MANN
       [u √]           [u √]          [u̶ √̶]                   [u̶ √̶]
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Suffix √ER carries an uninterpretable feature [u √], as shown in (16a) which causes it to seek a suitable complement, another root. In the absence of such a complement, it cannot project to the phrasal level and further construction of structure cannot be contemplated, (16b). On the other hand, when √ER merges with a complement of the required type, it rids itself of its uninterpretable feature and projects at the phrasal level, (16c). The complex root formed in (16c) can now be categorized, i.e. it can be selected by a category-defining head and further mergers can take place. The reader will remember that √ER is an exceptionless umlauter. We return to this aspect of its behaviour below. For the time being, our exclusive concern is to establish that the selectional behavior of affixes can be characterized in terms of the proposed machinery, i.e. merger triggered by the need to check uninterpretable features. Crucially, Umlaut plays no role in that characterization. Ultimately, it will be shown to follow independently from a) the selectional requirements of affixes and b) the phasal mechanism.

At the outset of this subdiscussion plural √ER was described as a suffix that only attaches to an unsuffixed complement. We are now in a position to capture the notion 'suffix σ exclusively attaches to an unsuffixed base': a suffix corresponding to that definition can only attach to a root.

We now turn to a different aspect of the selectional behavior of suffixes. Some suffixes only attach to categories. For instance, noun forming +*keit* exclusively selects full-fledged adjectives, thus *Hagerkeit* 'gauntness' from adjective *hager* 'gaunt', (17).As depicted in (17a), suffixes of that type will carry a [u xP] uninterpretable feature, x standing for a variable ranging over {a, n, v}. Two comments are necessary at this point.

First, as just pointed out, the fact that a suffix carries a [u √] feature causes it to select an unsuffixed complement exclusively. By contrast, a suffix carrying a [u xP] uninterpretable feature is intrinsically incapable of discriminating in that fashion. Rather, it is solely sensitive to the properties of the head of its complement and entirely oblivious to the contents of the complement of the latter. Concretely, this means that +*keit* – if correctly defined as a selector of aP's - will be incapable of discriminating on the basis of the complexity of the adjective it attaches to.[12] This appears to be correct, since +*keit* selects plain adjectives such as *hager* (17b) and complex adjectives as well, such as *zärtlich* 'tender' ([[zart]lich]), thus deriving *zärtlichkeit* 'tenderness', (17c).

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[12] A famous example of precisely the opposite is mentioned in Aronoff (1976). English +*al* attaches to X+ment if X is not a verb (e.g. *segment*), but not if X is a verb (e.g. *employmental*). Cf. Lowenstamm (2015) for critical discussion and a solution.

(17)   a.   b.   c.   d.

$$\text{nP}$$

(trees with nodes: √P, √KEIT, aP, n, √P, t√KEIT, aP, etc.)

a. √P — √KEIT, [u xP]

b. √P — √KEIT [u̶ x̶P̶], aP (a, √HAGER)

c. √P — √KEIT [u̶ x̶P̶], aP (a, "√" — √LICH+√ZART)

d. nP — n (√KEIT, n), → √P (t√KEIT, aP (a, √HAGER))

A substantial claim is thus made in the system advocated so far. It is recorded in (18).

(18) i. 'suffix σ exclusively attaches to an unsuffixed base' is possible selectional behavior

ii. 'suffix σ exclusively attaches to a suffixed base' is not possible selectional behavior

Secondly, there is something truly paradoxical in (17b), namely the fact that functional structure has been embedded under lexical structure. On the one hand, this cannot be avoided if a) suffixes are roots as I claim, and b) certain suffixes indeed select 'words'. I submit that the violation of canonical structure inherent in (17b,c) is immediately resolved by left-adjunction of the offending head root to the immediately dominating categorizer *n*. This is shown in (17d): upon left-adjunction of √KEIT to *n*, it is now *n* that heads the √P as indicated by the rightward pointing arrow, in conformity with canonical structure.

   Finally, a third type of selectional behavior will be recognized, the combination of both types just reviewed. √LICH raises a problem with respect to exactly what it selects. Consider the data in (19).
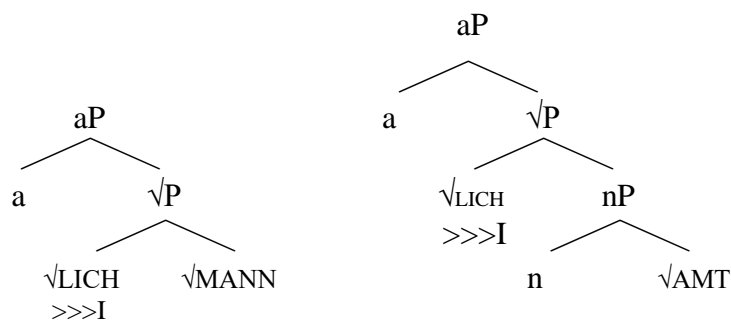
(19) a. Mann   'man'   männlich 'manly'

b. Mannschaft   'team'   mannschaftlich 'teamlike'

Clearly, √LICH selects nouns as attested by *Mannschaft*. If it selects nouns, it must be incapable of distinguishing between suffixed and unsuffixed nouns, *per* (18). Thus, when no suffix intervenes between √LICH and the base it attaches to, as in *männlich*, it could equally well be attaching to the noun Mann or to root √MANN. Which is it? It is at this point that the Umlaut conundrum which so puzzled the phonologist becomes the morphologist's ally, and presumably the learner's as well. Indeed, it is precisely when √LICH, attaches to an unsuffixed base that it displays its ambiguous behavior, sometimes umlauting (20a), sometimes not (20b).

(20)   Mann   männlich
       Amt   amtlich

I submit that the Umlaut difference in (20) reflects a difference in the level targeted by √LICH: the target in (20a) is √MANN; the target in (20b) is [nP √AMT]. This is graphically represented in (21), this time with √LICH equipped with its umlauting property (noted >>>I).

(21)

$$
\begin{array}{cc}
\text{aP} & \text{aP} \\
\quad a \quad \surd\text{P} & \quad a \quad \surd\text{P} \\
\quad\quad \surd\text{LICH} \quad \surd\text{MANN} & \quad\quad \surd\text{LICH} \quad nP \\
\quad\quad {>}{>}{>}\text{I} & \quad\quad {>}{>}{>}\text{I} \quad\quad n \quad \surd\text{AMT}
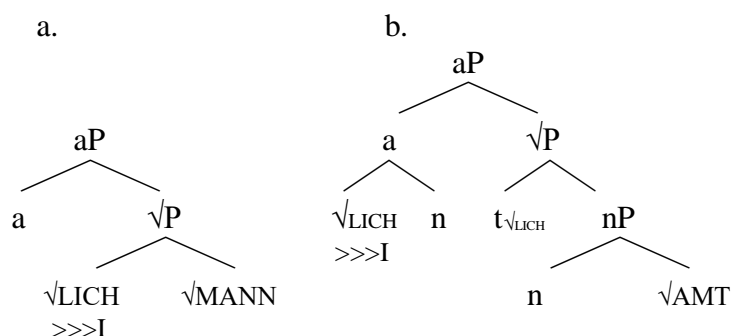\end{array}
$$

The phasal mechanism can now interpret the structures in (21).

I assume a version of phasal interpretation as in Marvin (2003) whereby each phase head triggers the spellout of its complement. Following Embick (2010), I assume moreover that the two relevant phases are those headed by aP since both contain the two partners of √LICH. As things stand in (21), √LICH is likely to be interpreted during the same interpretive phase as its partner in both (21a) and (21b). However, as the reader will have noted, (21b) incorporates a violation of the canonical order of projections inasmuch as √LICH dominates an *nP*. But after the operation of the repair strategy which left-adjoins √LICH to the head of *aP*, √LICH finds itself outside the scope of spellout of the adjectival phase and will be realized independently of √AMT. This is shown in (22b).

(22)   a.   b.

$$
\begin{array}{cc}
\text{aP} & \text{aP} \\
\quad a \quad \surd\text{P} & \quad a \quad \surd\text{P} \\
\quad\quad \surd\text{LICH} \quad \surd\text{MANN} & \surd\text{LICH} \quad n \quad t_{\surd\text{LICH}} \quad nP \\
\quad\quad {>}{>}{>}\text{I} & {>}{>}{>}\text{I} \quad\quad\quad n \quad \surd\text{AMT}
\end{array}
$$

√LICH and √MANN are spelled out together in (22a). √LICH, releases its umlauting property and *männlich* is derived. On the other hand, √LICH and √AMT in (22b) are spelled out at different phases. The umlauting potential of √LICH remains unspent and *amtlich* surfaces.

4 Conclusion

In this note, I have argued that German Umlaut is amenable to analysis under a slightly more sophisticated view than is usually assumed of how the relevant ingredients combine. In the process, I also hope to cause analysts to relax a bit. Indeed, most attempts at tackling Umlaut seem to view the task at hand as involving something along the lines of (23).

(23) i. Predicting whether Amt+lich will result in *amtlich* or *ämtlich*

   ii. Ruling out *ämtlich*
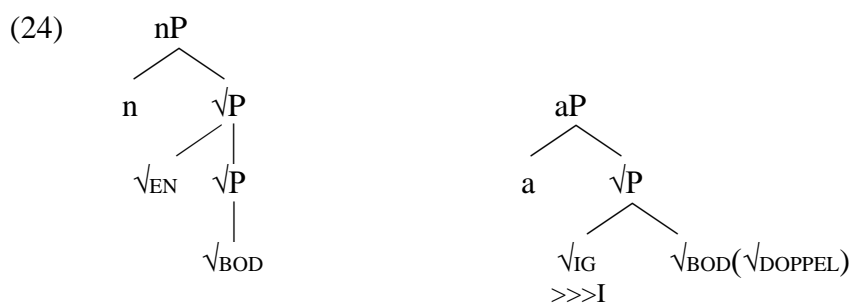
   iii. Ruling in *amtlich*

In reality, there is nothing to predict, to rule in or out! Rules apply! Indeed, *ämtlich* is perfectly well-formed. The problem with *ämtlich* is thus not its ungrammaticality. The

problem, rather, is simply that it is not in use, not known to speakers, not attested, etc. But any speaker finding out that *ämtlich* is used in another region, generation, profession, or social class other than his/her own would readily accept it. There is nothing surprising in that, given that the set of words we use is always vastly inferior to the set of well-formed words. To put things differently, Umlaut is entirely predictable, what is not predictable is what words out of the set of possible words will actually be in use at any given time. Before deciding that my answer is too glib, the reader is invited to consider what would count in favour or against my stance. Suppose counterfactually that *mannlich* and *ämtlich* were in use but not *männlich* and *amtlich*. We would have the exact same problem: why those two but not the other two. Clearly, what is required in order to establish that unattested *ämtlich* is no less likely than attested *amtlich* are cases where both options (Umlaut and absence thereof) are realized *for the same item*. Simple pairs such as *sachlich* 'factual, objective' from *Sache* 'thing, matter' as opposed to *sächlich* 'Neuter gender (as opposed to Feminine and Masculine)' are not terribly numerous, though the latter clearly shows that absence of Umlaut goes hand in hand with compositional meaning. But German productively creates compound adjectives, a rich source for what we are looking for. Thus, consider *flachnasig* (from *flach* 'flat' and *Nase* 'nose'), crucially without Umlaut. *Flachnasig* denotes exactly what can be expected under compositionality, viz. a flat-nosed creature. This sharply contrasts with *hochnäsig* (from *hoch* 'high' and *Nase*), crucially with Umlaut, which means 'pretentious'. Another example is *vertraglich*/*verträglich*, from *Vertrag* 'contract'. Expectedly, *vertraglich* is fully compositional and means 'contractual' while *verträglich* means 'good-natured'. A minimal pair such as *rotznasig* and *rotznäsig* from *Rotz* 'snot' is another example: both can be glossed as *snotty*, but *rotznasig* without Umlaut is fully compositional and describes an otorhinolaryngological condition, whereas *rotznäsig* with no Umlaut and non-compositional meaning describes the attitude of an arrogant individual. This last example is especially interesting because it lends itself to an experience the result of which can easily be replicated. It appears that not all speakers are familiar with both *rotznasig* and *rotznäsig*. Indeed, perhaps unsurprisingly, more speakers are familiar with the compositional item, *rotznasig*, than are with both *rotznasig* and *rotznäsig*. Speakers of this last group will recognize *rotznasig*, but will express uncertainty, even skepticism about *rotznäsig*. Some will even emphatically deny its existence, especially when they realize that the question emanates from a non-native speaker. But, when assured in sufficiently persuasive fashion (preferably by another native speaker) that many use *rotznäsig*– crucially in non-compositional sense - to mean 'arrogant', they readily accept the fact. Many more such examples can be found, cf. Lowenstamm (in preparation).
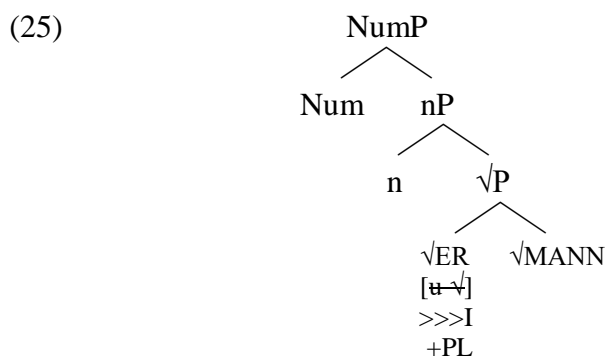
Appendix

Appendix 1 Root √BOD

Earlier, I mentioned that no word such as *bod* is known in German, though a root √BOD does exist. I claim that root √BOD underlies the noun *Boden* 'ground'. I submit that +*en* is a root adjunct as shown in (24a). Yet, adjectival suffix √IG can select √BOD directly, in effect peeling off the adjunct layer. Both Umlaut and non-compositionality ensue: *doppelbödig* 'ambiguous'

(24)

```
        nP                                    aP
       /  \                                  /  \
      n    √P                               a    √P
          /  \                                  /  \
        √EN   √P                             √IG    √BOD(√DOPPEL)
              |                              >>>I
             √BOD
```

Appendix 2 Root √ER

It was argued above that the structure of an +er plural is as indicated in (16) repeated in (25), this time after selection by the Num head.

(25)

```
         NumP
        /    \
      Num     nP
             /  \
            n    √P
                /  \
             √ER    √MANN
             [u→ʉ]
             >>>I
             +PL
```

While *Männer* is certainly plural, +*er* is not the exponent of the Num head. Rather, it was argued, +*er* is part of the complex root represented in (25).[13] Evidence for that claim comes from the fact that a complex root such as in (25) can be directly selected by adjectival √IG, e.g. *blätterig* 'leafy' from *Blätter* 'leaves', pronounced [blɛtər]. Strikingly, *blätterig* can be pronounced [blɛtrik]. The fact that √IG has been capable of triggering syncope shows that all three ingredients, √BLATT, √ER, and √IG are realized in the same phase.

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[13] In a sense, it could be said that *Männer* is a *pluraletantum* that happens to have a corresponding singular, in contradistinction with *Wissenschaften* 'sciences' which is the true plural of its singular.

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