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The non-grammaticality of phonetics

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Abstract: Here I observe that the grammatical system that constitutes our knowledge of language and formulates how syntactic and phonological structures may be constructed on the basis of context and the categories and their colligational information stored in the lexicon of signs does not contain a phonetic level. Indeed, what phonetics describes does not contribute to this grammatical system, but belongs to an interface where it implements phonological structures as a set of articulatory movements; and, reversing the interface, the sounds they create can be scanned by our auditory apparatus for indication of those distinctions in sound and their location that can be used to differentiate signs. These articulations and the functioning of the specifically auricular apparatus are capacities that differ from the purely mental capacity that is our knowledge of grammar and its use. One indication of this is precisely the lack of any grammatical motivation for the recognition of a determinate phonetic level, something not always acknowledged by phonological theories. This situation is illustrated here with reference to so-called 'vowel harmony' and to the prosodic contribution to the characterization of '*i*-umlaut' and 'breaking' in the development of Old English.

Keywords: grammar versus implementation; vowel-harmony; prosodies; Old-English umlauts; phonological theories

1 Introduction

My starting point for what is concluded here can be seen as the assumption of Saussure as described in Joseph (2012: 236,237).*

> In the *Mémoire*, the phoneme is not conceived of as a sound as such, but a unit within a system. Phonemes will find their material substance in sound, but that is not their essence. The essential thing is how they function relative to the other units in the same system. Whatever their exact sound happens to be is accidental, contingent. … The reality of language, Saussure would insist, lay not in sound, not in the muscular movements needed to produce sound, not in the vibratory acoustics of their transmission and perception – but in form, understood as mental patterns,

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> ultimately cerebral traces, socially shared, that made it possible to produce and recognize substance as meaningful language.

(Saussure [1879]). I am not concerned with the other 'Saussurean dichotomies' described by Lyons (1977: §8.2), some of which are also controversial. What immediately follows, however, is an attempt to formulate, communicate, and resolve what one might otherwise call 'the language substance paradox' that an account of grammar overtly based on substance, such as is advocated in Anderson (2011a, 2022), might be said to introduce. The apparent 'paradox' arises as a consequence of adopting such a substantive view of linguistic structure, the view that linguistic structure is based on the substances (or mental patterns) it represents – though, of course, the usage of a language may lead to the conventionalizing of aspects of representation, such as in the development of subjecthood. The apparent paradox is that phonetics is seen as not part of substance-based grammar, even though the former is concerned with the articulation of speech sounds and the acoustic differences associated with different articulations, substantive differences. I shall argue, however that the 'paradox' is only apparent. Let us look at how it arises, and why it shouldn't, and doesn't, before looking at the importance of the phonology/phonetics distinction in formulations of the location of contrastivity in phonological structure. This is illustrated here particularly in accounts of the history of English but with consequences for the study of language and language change in general.

2 A non-paradox

I am assuming, then, that grammar, in an inclusive sense, gives an account of linguistic knowledge, which includes the ability to assemble linguistic structures on the basis of what is stored in, or can be provided by redundancy specifications in, the lexicon. I do not distinguish between 'competence' and 'performance', which distinction introduces a mode of evasion of evaluation of claims about language; but I recognize mis-performance as something for researchers to be aware and wary of. The major distinction I would make is between the information that the language user can extract from the lexicon and the creation of non-mutational syntactic (content) and phonological (expression) structures that, with the help of awareness of context, are assigned at the interfaces between these three components: the lexicon, content plane, and the phonological plane.

My main objective here is not to advocate any particular theoretical framework, however, and I avoid grammatical particularities as much as possible. Nevertheless, in what follows I shall assume a 'substance-based' grammar: both syntax and phonology are based on mental substance, conceptual and perceptual, and they give

it a particular structure. This is not just because I would advocate such a grammar – though I do (cf. e.g. Andor [2018]) – but because this sharpens the apparent paradox. And, as we proceed, I shall introduce some, I hope useful, notation drawn from such a framework – as illustrated in Anderson (2011b, vol. III: particularly chs.2–4; 2022).

In terms of such a substance-based view of grammar, I contend that the study of how linguistic knowledge and the linguistic structures that are its artefacts do not include the study of how language structures are made audible, via vocal articulation; and, indeed, the extraction of linguistic structure by hearing via the aural mechanism is also not part of grammar: articulatory/auricular/phonetics is not part of grammar. Nor are 'transcriptions' or acoustic records part of grammar. It is possible to conceive of this theoretical position as 'paradoxical': a grammar based on substance does not include the study of the substance by which linguistic representations are implemented or recognized. I suggest that this 'paradox' is not such; and the clue to that is in a comparison of the substances. This position is not paradoxical because the substance of grammar is conceptual and perceptual, mental, while that of what is described by phonetics is operational; it is an interface that involves motor control of the vocal tract that provides audible implementation of phonological structure or the recognition of linguistic structure in the sounds that are registered auricularly via the ear tube. These are quite distinct capacities from knowledge and use of grammar as such. Phonology represents, in the first place, contrasts in the internalization of perceived sound that differentiate among signs, more specifically those contrasts belonging to the expression pole of the sign, particularly the minimal sign, or word.

As well as with lexical contrasts, phonology is also concerned with extralexical contrasts, particularly in tone and its placement, that signal (conceptual) content distinctions, such as emphasis and questioning, as well as the adjustments to minimal signs in sequence to do with the placement of sentential accentuation and of word-boundary phenomena such as attachment of an unstressed initial syllable to an accented syllable ending the preceding sign. In *Move around the corner?*, *a-* and *the* form part of the feet governed by the accented *move* and *-round* respectively and the latter are part of the tone group headed by the primary/tonic accent on *corn-*, which bears the tone that signals interrogation. This is no place to elaborate the phonological representations I would suggest (drawn from e.g. Anderson's [2022] grammar of English), but perhaps this brief description will have conveyed something that is helpful.

Phonology represents sound images, such that there is typically an arbitrary relation between the expression and content poles of the sign, though there have been various different kinds of attempt at 'sound symbolism' (see e.g. Colman [2014: §5.4.2] and the references given there). And the content pole and syntax represent

conceptualisations, but are often also perceptual, at least figuratively, particularly metaphorically or metonymically, in dealing with non-concrete, particularly mental domains. As a familiar example, thoughts may be represented as part of the content of the brain or even head, as in *I just can't get that out of my head* – or, perhaps more picturesquely, Dashiel Hammett's *I woke next morning with an idea in my skull*, at the beginning of ch.IX of his *Red Harvest*. These are suppletive, not merely supplementary, figures; they are instrumental in the expression of thought in speech.

In this way language is indeed the principal 'language', or carrier, of thought. Artificial, or philosophical 'languages', or 'syntaxes', are simplifications of 'real' language (often naively believed to be 'improvements' on the latter). Much language use is thus not implemented; much 'communication' and interaction is with our selves, often silently, without even requiring, to ensure this, the intervention of a strict librarian. Given the prevalence in language of envisualization and figurativeness, including iconicity, much content as well as expression is ultimately perceptually-based, unless conventionalized in usage. Extra-lexical content and expression structures are erected on the basis of the contents of the lexicon, i.e. as anticipated, at the interfaces that feed hierarchized and sequential content and expression structures.

Language users select from the lexicon signs that are equipped with valencies that allow them to be assembled into self-standing units. But at the same time, such units may be self-standing only by virtue of encyclopaedic knowledge and/or awareness of the context, both situational and textual. For an (obvious) instance, many answers – e.g. *Tomorrow*. – can be understood only in context. Language, however, helps contextualization by supplying deictic and referential signs, which may often be supplemented by 'literal', gestural deixis. Semantically-based syntax and perceptually-based phonology are substantivally based, as is phonetics, but differ in focus, in the substance represented; I thus do not in agreement with Hale and Reiss (2000) and others who would deny substance to phonology. That substance is typically implemented in sound, but there are other media available, involving graphic and gestural, in many cases parasitic upon phonetics.

3 Linguistics, grammar, and phonetics

So much for grandmothers and egg-sucking. I want to contrast vocal implementation and auricular extrapolation of phonological representation of content-expounding contrasts with the complex mental status of grammatical structure and what it manipulates, and its determinate stratification into levels. Stratification arises principally in the differentiation of the content and expression planes, but it also arises from the order in the interfaces in which representational properties such as

hierarchization (e.g. by the dependency relation) and sequencing are introduced. There is, however, as Kaye (1995) affirms (vainly, in its effect on many researchers), no phonetic level of grammatical representation. Unfortunately, for him and others, such a recognition leads, perversely, to the regarding of many phonetic events as part of phonological 'derivation'.

The content of what implements phonological elements in sound can be variously detailed, as indicated in alternative 'transcriptions', a variety partially concealed by the traditional distinguishing of 'broad' and 'narrow' transcriptions, which embody arbitrary conventions, without systemic status; spectrograms and other instruments also may be of varying definition. The non-determinateness of articulatory implementation is complemented by the reception by hearers of sound of varied definition and detail, from which contrasts may be extracted.

But determinate levels and particularly planes arise only when contrast is expressed by the poles of signs and the extra-lexical structures of syntax and phonology. Signs are learned conceptual entities; but, as observed, their implementation involves quite different capacities, motor control (articulation) and hearing (audition). David Abercrombie wisely entitled his 1965 collection of papers *Studies in Phonetics and Linguistics*. But I would have had to reassure him that my intention here is not to demean what he makes the former discipline in his title; my aim is merely to remind us (possibly unnecessarily) of a crucial difference in what these two disciplines, particularly if distinguished as grammar versus phonetics (regarding both as linguistic disciplines), are concerned with, and a consequent limit on the domain of grammar.

Studies of the history of English and other languages are particularly susceptible to confusion of phonology and phonetics, and concerning the location of contrast. Thus, for instance, Hogg's (1992) description of various 'sound-changes' reconstructed as having occurred in pre-Old English or historical Old English confuses the nature of the change. Hogg adopts what he terms a 'phonemic theory' (1992; preface, p. viii), and his notation distinguishes between contrastive forms and phonetic in terms of inclusion within // rather than within [ ], though he does sometimes relapse into an indeterminate italic notation, as in representation of the *i*-umlaut 'sound-change' in '**gaduling* > *gædeling*' (p. 124), with the pre-historic (so not testified orthographically) form distinguished by the asterisk. *I*-umlaut is introduced in more detail on his p. 121 as involving historical sequences such as */gɑduling/ > */gɑdyling/ > */gædyling/ >/gædeling/ = *gædeling 'companion'*, where the different stages separated by '>' are apparently interpreted as phonemically different, involving changes in the system of contrast at particular vocalic positions. But all that the reconstructed successive first three representations suggest is a suprasegmental expansion of the phonetic implementation of the typically vocalic secondary feature that I label

(following Anderson [2022: ch.12]) {i} (a feature implemented in the area of 'high front unrounded', in articulatory terms).

Overall in the above history, we have a change from **i** as associated with a vocalic segment, as represented by {V{i}} (the final one in this morphologically derived word stem), to association with the node governing the whole stem, and eventually a weakening of the medial vowel; but there is no evidence of how these are ordered, unless we assume that this first kind of 'harmonic' change, or 'spreading', must take place segment by segment. However, the medial vowel reduction may precede or follow the 'harmony', since a reduced segment need not express or block a 'spreading' the **i**-vowel quality. And the 'spread' of the feature need not appeal to the intermediate stages in Hogg's sequence; indeed, there is no evidence for these intermediates. Either way we have the development of a prosody, a change from intrasegmental segment to suprasegmental status for **i**: a change in location of the contrast.

I shall look more formally at what is happening in *i*-umlaut in §4. But firstly I shall look at a related but more spectacular synchronic phenomenon, prompted by Hogg's comment on *i*-umlaut (p. 121, again) that 'There is, therefore, no reason to suppose that we are dealing with anything other than a type of vowel harmony'.

4 Vowel harmony versus prosody

Phonology versus phonetics is an important distinction which, however, is often blurred by students of language. 'Phonological spreading', for instance is often attributed to the 'vowel-harmony' systems discussed in relation to a number of languages, but I shall suggest that this 'spreading' is associated not with phonology but with articulatory implementation. I shall illustrate this with respect to a simple hypothetical but typical 'vowel-harmony' system.

I take 'vowel-harmony' to involve a prosody in a variant of the Firthian sense (1948) – the 'word prosodies' of Lass (1984: §10.2.3). A certain feature (or feature value, if you prefer) characteristic of vowels is manifested throughout a word form in my (hypothetical) example, but certain segments, especially non-vowels, may render it more or less opaque at that point. Phonologically there is a single contrast, the presence versus absence of the prosody; its 'spreading' – better, implementation in 'real' time – over the stretch of sound subordinate to the prosody-bearing tonic (root) node of the word is manifested in articulation, but there remains only one contrast, that between the prosody and its absence. Implementation does not change this; it is not a grammatical phenomenon.

We might store such an expression form in the lexicon as in (1), where the square brackets mark the boundary of the expression pole of a minimal, or word-stem, sign consisting of a variably large set of segments, where only the relative order of the

syllables and their provisional content need be specified (though this is not relevant here).

(1) [{i}{{B}{V}{C}{D}{E}{F}…}]

{i} is the prosodic phonological feature, representative of common prosodic features. And it is extrasegmental: it lies outside the set of segments, represented here by arbitrary capitals, whatever they might be. In the interface between lexicon and lexical phonology these segments are linearized and project a dependency structure in which {i} is attached to the tonic, the head of the word form, stem or full word, depending on the language.

Let's say, for simplicity of illustration, that we take the second segment here at its possible face value in (1) – 'V' – as a vowel, and that this vowel supports that word-form head, so that we have, whatever else, the subjoined (unsequenced) dependency structure in (2) above the V of (1), where from the top we have a tonic (intonation-carrying) head {V}, an ictus (foot), a syllabic, and a rhymal {V} (which are all potential prosody-carriers, though here we are concerned with a prosody-bearing tonic).

(2)
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{V{i}}
  |
{V}
  |
{V}
  |
[…{V}……]
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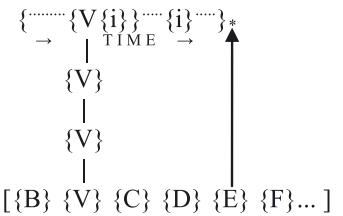
{V} is a major category, one of those features that alone or in combination represent the major categories that determine the basic distribution of segments; {i} is a minor feature, often subclassifying a {V}. The rest of the structure need not concern us, so far. The prosody is a feature of the tonic, the node that carries 'primary accent' and bears a tone when the word is pronounced in isolation. A non-intonational minor feature of the word head and its articulation are expressed (other thing being equal) throughout the word-form, though some segments may be more or less opaque to it, with the typically most transparent being vowels, as suggested by the traditional nomenclature.

However, it is likely that this whole configuration in (2) will be stored, or at least the set of segments, their syllabic structure, and the value of tonic-prosody. (1) Provides the non-redundant set of contrasts, one of which is extra-segmental with respect to the word structure, without specifying the redundant tonic selection, which is erected in the interface between lexicon and lexical phonology, in which accentuation and sub syntactic sequence are assigned. Figures (1) and (2) simplify the lexical representations, of course, by ignoring any indication of syllable sequence

and presence of segments within onset or rhyme, which, unlike sequence within onset and rhyme are not redundant (see Anderson [2011c: part III], and Anderson [2022: chs. 6, 11–13]). But these absences are not pertinent to our concern with the 'spreading' phenomenon and its status.

There is another factor in a number of 'harmony' systems. There may be a segment type, varying in different systems, that is not just (relatively) opaque, but 'blocks' the prosody from being manifested in the following sequence of segments, i.e. in segments that are articulated after it. And appeal to articulation is the point of my illustration. For 'blocking', as with 'spreading' itself, applies to the implementation of the prosody, which is in real time. It is not a phonological phenomenon: what is phonological here is the presence of the prosody, which can contrast with its absence in distinguishing lexical items, however far its implementation extends within an item. The possibility of 'blocking' is a by-product of implementation of the prosody, in the form of a particular articulation, which, as occurring in time, can manifest the 'blocking' of the prosody in the course of its implementation, as diagrammaticized in a simple way in (3), where {E}, whatever its value, is a 'blocker'; and, once more, in the hierarchy of {V}s, each is subjoined in dependency to the one above, and {i} is representative of the secondary features that may subclassify vowels, whatever else.

(3)



The tonic vowel is the root of the dependency tree, other aspects of whose structure are not specified here. The upper dotted horizontal marks the path of implementation of the prosody {i}, starting at the beginning of the phonological, or expression, pole of the lexical item; and the upward arrow indicates the implementation of the 'blocker', i.e. {E}.The 'blocking' belongs to phonetics; it does not introduce a contrast, which is a property of phonology, specifically in this case the tonic node; here we have combination of a prosodic contrast and segmental contrasts and their phonetic implementation, involving 'blocking' of the implementation of the prosody in the present case. If readers prefer, or demand, 'real time' to be matched with 'real examples', they may consult the extensive survey in van der Hulst (2018), which also provides further complications in implementation. These include interaction between the implementations of different word prosodies, or the possibility of more minor differences,

such as the location of the tonic node within the lexical item – though the 'real-time spreading' is still from the beginning of the first accessible segment of the relevant (tone) group, comprising the head and its subordinates.

There is also a brief discussion along the present lines of two familiar 'harmony' systems in Anderson (2011a: §4.2). But that account does not insist on the implementationary nature of the 'spreading', and, 'retro-perversely'(!), uses a different terminology from the present description. But we can extract from that and other accounts of the Finnish system a 'real' analogy for the simple hypothetical situation just described, but without complications such as 'blocking' or 'opacity', or many complexities found elsewhere, as again illustrated in van der Hulst (2018).

The often cited Finnish word *pöytä* 'table' can be said to 'contain' the prosodic feature {i}, and it contrasts in this respect with *pouta* 'fine weather', which lacks {i}. The former item differs from the latter in the presence of an **i** attached to the word tonic. In the lexicon this could be stored in the manner of (1) (though sequence of syllables is stored, and within syllables is redundant, apart from whether they belong to onset or coda), with the prosodic feature outside the set of segments, as in (4).

(4) {i { {C{ {u}}}, { {V{a.u}}, {V{u}},{C}, {V{v}} } }

Lexically, *pouta* would lack the **i**, and so fail to show 'harmony'. In the lexical phonology structure of *pöytä*, but not *pouta*, {i} will be attached to the lexical tonic at the interface to lexical phonological structure, as in the artificial example (2) suggested above.

We have been looking at word prosodies. There are also, of course, prosodies associated not just with phonological nodes but also with lexical-derivational or inflectional structure, and sometimes a diachronic segmental 'trigger' of the prosody can be identified and may remain as such, for a period at least. There is evidence for the diachrony of at least some prosodies that involves a rather more intricate picture than the synchronic presence of a word 'harmony' perhaps suggests.

For instance, there was introduced in §3, a suffix-induced prosody in pre-Old and Old English and other languages that I shall again represent as {i} (implemented as 'high front unrounded' in articulatory terms), which is introduced by the presence of certain suffixes both derivational and inflectional, though Campbell (1959: §192) too suggests that it, traditional i-umlaut, 'may be a mere vowel harmony' – whatever he may imply by that, particularly the 'mere'.

5 'Umlaut' as a prosody

The development of the umlaut variety of prosody described by Barbara Strang (1970: 387–8) is manifested in the history of the derived form in Old English spelled

cyning, 'king'. One might, in the notation of Anderson (2022: ch. 6), represent the development of the pre-prosodic suffixed form lexically, again crudely, as in (5).

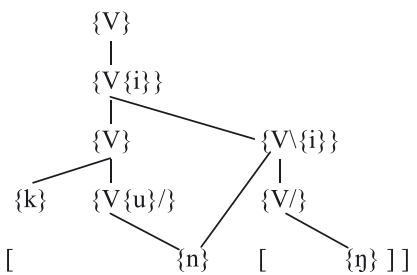
(5) a. [{k}{V{u}/}{n} [{V{i}/{ŋ}]] → b. [{k}{V{u}/}{n} [\{i} [{V/} {ŋ}]]]

On the left, in (5a), {V{u}/} is transitive (or 'checked' or 'short' or 'lax', if the reader prefers), so taking a following complementary consonant rather than an optional adjunct; its transitivity is marked notationally by an immediately following '/', as shown in the representation. This first (transitive) vowel segment has a secondary feature {u} (high back rounded, in articulatory terms). The characters of the other (non-vocalic) symbols (such as {ŋ} – segment or cluster?) are immaterial, as simply 'place-holders', at this point. The outer square brackets in (5a) again enclose the word form/stem, and the suffix has its own brackets included within the outer brackets. The two vowels belong to distinct local contrastive systems.

The first step in the change towards a prosody, in the representation in (5b), is the assimilation of the first, accented, accented vowel to the quality of the suffix, creating the possibility of a prosody, with an outer and an inner bracketing of the suffix. Simple {i} is excluded from the innermost bracketing in the suffix. This and the immediately preceding'\' mark {i} as inviting a prosody: it is not simply part of a vowel segment within the suffix; and the '\{i}' notation specifically 'asks for' a governing {i}. This is the diachronic mechanism of umlaut.

This results in a morphophonological prosody, triggered by the presence of the (in this case, derivational) suffix with the potential for projecting a prosody. A segmental feature has come to be implemented as prosodic: this status is represented more transparently in the partial dependency tree in (6), where the suffixal vowel is attached to the preceding ictus.

(6)



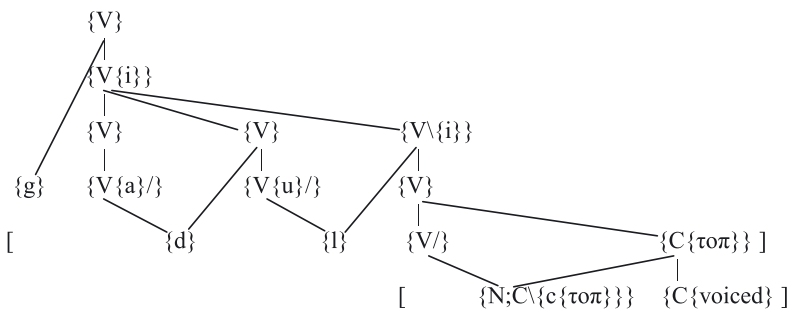
At the interface with the lexico-phonological interface a suprasegmental (lexical) phonological structure is erected, and the prosodic feature is attached to the nearest governing {V}, the ictus that in this instance governs the vowel of the base, as indicated in the more extended dependency structure of lexico-phonological representation of (6), which displays both adjunction (the undergoing of sequenced

government) to the ictus and its subjunction to the tonic {V}, as do the ictus and the syllabic and the rhyme, of course. And there is also mid-foot ambisyllabicity: the mid-foot consonant satisfies the transitivity of the first vowel and the (unmarked) initial-maximalism of the following syllable.

The structure in (6) ignores other aspects of the morphology of the form. The spelling of the first vowel in *cyning* represents the implementational combination of {u} and {i}: the {u} is heard as a step closer to {i}: the combination {u,i} is high-front-rounded in articulatory terms. The prosody is implemented on any compatible segment between the source vowel and the target vowel of the assimilation: a so-called 'harmony', again an implementational phenomenon. See too Anderson (2011a: §4.4.1), for instance. But for a more comprehensive account of *i*-umlaut in the context of other developments in Old English see Colman (2005).

In trisyllabic feet where the first two syllabics lack an inherent {i} feature the whole foot is still subject to such a prosody. We thus find the of our old friend with the spelling *gædeling*, 'companion', with the remains of 'double umlaut' (Campbell [1959: §203]), where the first two syllabics are usually reconstructed as having {V{a}} and {V{u}} as their pre-prosodic ancestors. At this prehistoric stage the prosody can be reconstructed as in (7), where again non-active consonants are abbreviated as a simple traditional transcription, except that I have opened out the final cluster, headed by the less sonorous consonant (thus, qualitatively more differentiated from the syllabic), to which we shall return.

(7)



The first vowel is heard as {a;i} (**a** dominates over **i**, giving a 'fronted' {a}, spelled *æ*), since there is a contrast with {i;a}, spelled *e*; and the second vowel again is perceived as the simple combination {u,i}.

There are also two ambisyllabicities following the tonic accent in (7). And the medial syllable is subsequently reduced, reflected in the spelling; this is not unexpected, given that its 'transitive' vowel shares its complement with the onset of the following, final, syllable as well as sharing its onset with the complement of the first vowel, thereby fulfilling onset maximization; the vowel thus occupies a classic

position for diachronic 'weakening', or reduction, of a vowel to occur. A reduced vowel is plausibly regarded as opaque to the prosody, and, anyway, the reduction of this vowel apparently post-dates the triggering of the prosody. In the coda of the last syllable, as normally in any consonant cluster, the more sonorous consonant, a nasal, depends on the less, the more plosive-like and more differentiated from **V**.

I note too in relation to (7) the 'further' (consonantal, or coda) prosody involving the final cluster. The content of the final coda prosody and its trigger, where {τοπ} is a variable over (articulated) 'place-agreement' and {V;C{c}} is a place-neutral nasal, and the coda is interpreted as consisting of two rather than one consonant – unlike in the stop-gap representation in (6). If the third syllable in (7) is argued to have a non-primary accent (whose presence is contentious, particularly since the 'evidence' for this is metrical and the latter is based on utterance prominence, not lexical accentual structure), the placement of the vocalic prosody and its trigger would need to be adjusted. I observe in passing that reduced vowels, represented as {V</>}, may or may not have a satisfied transitivity, depending on whether or not a suitable following coda consonant is available.

When/if the {i}-suffix involved is lost, as it is in *bec*, the nominative/accusative plural (and genitive and dative singular) of *boc*, 'book', one might expect the prosody to disappear. But the manifestation of the prosody in the implementationally transparent formerly intervocalic consonant as well as the vowel quality is retained: thus *bec* 'books' is usually interpreted as phonologically ending in a palatal consonant of some sort; Campbell (1959: §428) and others indicate this with a dot over the *c* graph. The rhyme segments are collectively contrastive: indeed, the rhyme apparently bears a prosodic {i}, and it is inflectionally contrastive. We have a paradigmatic prosody associated with the rhyme of forms of this item. *Boc* 'book', consistently in nominative/accusative singular forms, is interpreted as lacking 'high unrounded frontness', or (better) {i}, throughout its rhyme. The prosody is 'triggered' by particular inflectional values; it too is morphophonological, but inflectionally, not derivationally. In forms like *king* the prosody has subsequently been segmentalized and installed as a member of the major transitive-vowel subsystem.

Sometimes the prosody is apparently neither derivational nor paradigmatic, but a simple rhyme prosody, without a 'trigger', as in *bæc*, 'back', or pic, 'pitch' (Campbell [1959: §428]); however, as Fran Colman has pointed out to me, historical *bæc* has lost any prosody it might have had (Campbell [1959: §434]), as has the plural of *book* – though in this case apparently as the result of morphological analogy. Compare *bæce* 'beech tree'.

Adze in modern English exhibits a coda prosody of voicing, attached to the head of the coda, realized as the plosive. But this is taking us further off on a side-issue: the prevalence of prosodies in phonology and thus of persistent articulations in the implementation of phonology. Implementation does not involve simply the

identifying of so-called 'allophonies' – i.e. polytopical contrastive units, involving contrasts that occur in different positions – as well as the filling in of redundancies. The 'filling-in' of these, however, takes us back to the main points here, the non-grammaticality of phonetics, and thus the lack of a principled point at which to stop filling in non-contrastive implementational details as part of grammar, i.e. the lack of a non-arbitrary phonetic level.

6 'Breaking'

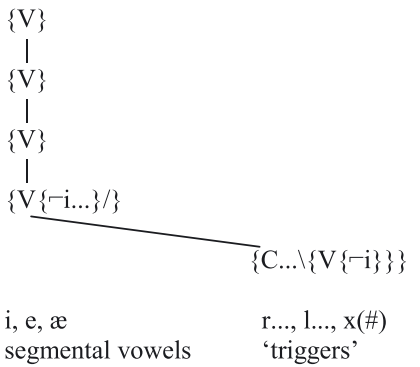
Another prosody, whose implementation is more contentious, involves the consequence of the Old English 'sound-change' that is usually rather prematurely labelled as 'breaking', though the only thing that is uncontroversially 'broken' is the spelling of the syllabic concerned (with two successive vowel graphs): hence the continuing 'digraph controversy' in studies of Old English. We are concerned in this case with forms such as (in these examples) a transitive (short) monosyllabic *feoh* 'cattle' and *bearn* 'child' and with similar intransive (long/tensed) vowels. The vocalic phonetic implementations are contentious, given doubt concerning the precise scope of the 'backness' rhyme prosody that seems to be involved and the phonological or phonetic interpretation of the digraphs: is the 'backness' projected by the coda initiation realized as the second component of a diphthong, or as a feature of the rhyme or even a diacritic of the backness of the (initiation of the) coda or a glide to it?

Hogg (1992: ch. 5, section II) defends the traditional 'diphthongal' interpretation, with his usual confusion about bracketing: as in 'The short vowel /e/ is regularly broken to /ĕu/' (p.88), even though the proposed diphthongization is conditioned by the context. The tradition is also defended by Kuhn and Quirk (1953, 1955) and Kuhn (1961), in response, particularly, to Stockwell and Barritt (1951, 1955, 1961). Other alternative views have been offered by Daunt (1939) and Hockett (1959).

A similar dilemma is associated with the later 'back umlaut' phenomenon said to be exemplified by *heofon* 'heaven'. The 'backness' prosody here is projected by the vowel of the following syllable and it affects only transitive ('short') vowels as well as being dialectally more restricted. Perhaps again the positing of a prosody is as far as we can safely conclude here on the basis of the available evidence, unless the spelling is simply diacritic. What we lack in this case too is clear evidence of how the front rhyme vowel interacts with the back prosodic vowel it is assigned in accordance with an equivalent of the structure for traditional breaking given in (8) below. Compare Lass's passing suggestion of 'breaking before back vowels' (1994: 51) as a title for the immediately above phenomenon, given the shared problems of interpretation with traditional 'breaking'.

We can sketch out the assignment of the prosodic value in traditional breaking of transitive vowels as in (8), perhaps, where a non-front feature ({⌐i}, with '⌐', as an absence marker) is added to the rhyme that the coda depends on, a representation that ignores the head of the coda in the case of the liquids (as well as the onset).

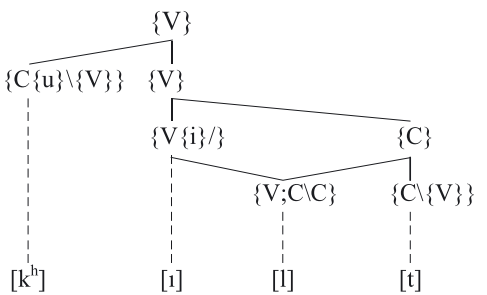
(8)



With 'back umlaut' the trigger is the back vowel of a syllabic adjoined to the rhyme head, as in the *i*-umlaut of (6); but again the implementation of the affected vowel is apparently uncertain. This is another context where a reconstructional notation must be capable of admitting incompleteness in our interpretation: in such instances different interpretations are difficult to evaluate; the value of the affected vowel is similarly contentious. And again a prosodic development replaces segmental implementation. But 'breaking before back vowels', rather than the structure in (8), however, is a simple parallel to the fuller representation in (6), but involving {⌐a} rather than {i}, would be appropriate.

In outlining these prosodic histories in this and the proceeding section, I have simplified the structural representations. Compare a full phonological syllable in Modern English in (74a) of Anderson (2022: 85), given here as (9), with a rough transcription to help the reader, where [k^h] is in contrast with [g] (as in *guilt*), and they are neutralized as [k] after initial [S] (as in *skill*).

(9)



The uppermost {V} is the syllabic and the lowest is the rhyme, complemented by the immediately preceding consonant in the coda; and the intermediate {V} is introduced by the plosive modifying the rhyme head. The higher consonant in the coda is the less sonorous, which the lateral is therefore subordinate to. There is no prosody, but there is a distinct system of contrasts at each position.

The claimed non-grammaticality of phonetics does not entail a denial that differences in implementation are one kind of indication of variation among and within social and/or localized groups of speakers. Phonetic phenomena are also important among factors promoting language change. And the evolution of the implementational capacities involved facilitated the innovation of language itself, having rendered our ancestors 'language-ready' (see e.g. Hurford [2014], in the tradition of Darwin and Saussure). But they are not part of grammar, and there is no determinate phonetic level of representation. Even the lower limit of the capacity to discriminate perception of sound varies among language users. On the other hand, much use of language, as the primary medium of thought, is silent, unimplemented phonetically – or, indeed, visibly, graphically or gesturally – though, not uncommonly, (intended) solitary reading is accompanied by lip movements, at least. An extreme manifestation of non-implementation is instanced by the affliction of tinnitus.

7 The failure of theories of synchronic phonology

What I have just presented is an illustration of areas where the domain of phonology is often misrepresented: the (synchronic) spreading of 'harmony', for example, is not phonological. Defining the domain of phonology is a perennial problem, though its character and justification for it may be and often are neglected. The classical concept of the 'littera', for instance, which persisted in discussions of phonology, or 'pronunciation', in the centuries that followed until the twentieth century, and even presently (though rarely acknowledged, but see e.g. Lass and Laing [2012: note 7]), is disastrous to attempts at the gaining of any understanding of the domain of phonology.

The littera is a complex unit consisting of a graphical shape, a phonic value, and a name. In application its value is not necessarily phonologically relevant, given its segmental unit status and the bi-unique relation between shape and value. The littera cannot cope with neutralization and prosodies, for example; and, as utilized, its value is not necessarily contrastive in particular cases. As a consequence of these limitations it encourages the tendency for spelling to become conventional, lagging

behind 'sound-change'. For a fuller discussion of these limitations and their consequences for phonological theory see Anderson (2014: §1).

This conformity to written forms also contaminates 'phoneme theory'. As Swadesh (1934: 35) makes clear, approvingly, phonemics can be argued to provide the basis for an optimal alphabetic orthography. But phonemics is thus not a theory of phonology, since, in wishing to achieve the equivalent of littera economy, it fails to recognize neutralization of contrasts in particular places in the poles of expression, requiring distinct symbols to indicate this. And it fails to characterize prosodic contrasts, which, as argued above, need to be recognized as non-segmental, not littera size, as well as failing to recognize segmental componentiality, which is associated with the preceding limitations.

Phonemics fails as phonology (Anderson [2014: §2]), as does the classical 'generative phonology' of Chomsky and Halle (1968) and descendants, which even extends the domain of the failure with its confusion of lexical phonological contrasts and morphophonological alternations (Anderson [2014: §3]). The introduction of 'feature geometry' (e.g. Clements and Elizabeth [1995]) further intrudes, in terms of this 'geometry', the representation of phonetic considerations in phonology. 'Optimality theory' (e.g. Lombardi ed. [2001]; Prince and Smolensky [2004]) also preserves much of the confusion of earlier generative phonology and adds even more confusion among the morphophonological, the phonological, and the phonetic, in terms of focus on the genesis of the selection of a language's constraints from the (allegedly) universally available set. These constraints may include implementational considerations, as in Pater's (1999, 2001) problematical '*NC$_{\circ}$', which in the words of Lombardi (2001: 6) 'penalizes a cluster of a nasal and a voiceless stop'.

And confusion between the phonological and the phonetic prevails in other recent literature, as in discussions of 'vowel harmony'. As we have seen in §2 above, the 'spreading' of a feature (value) through temporally successive vowels is not a phonological phenomenon; rather, a single contrastive feature associated with a word form is implement phonetically, in articulation, over the sequence subordinate to it, with varying perceptibility. And 'articulatory phonology' (e.g. Browman and Goldstein [1992]), indeed, is a contradiction, and paradoxically devoted almost entirely to phonetics. So too 'laboratory phonology' (in e.g. Cohn, Fougeron, and Huffman eds. [2011]).

The mixture of synchrony and diachrony of Anderson and Jones (1977), apart from suffering from the influence of generative phonology, does not distinguish consistently between phonological changes and phonetic; this is not excusable in view of the observation that many traditional 'sound-changes' are diachronically complex, involving phonetics, as in the assimilation of umlaut, and then, with possible loss of the conditioning environment, phonologization of a new contrast or at least a new instance of one. And much of the 'dependency phonology' of Anderson

and Ewen (1987: Part II) is concerned, without acknowledgement as such, with the articulatory implementation of a wide range of only potentially contrastive elements. So too with van der Hulst's (1994, 1995, 2020) 'radical CV phonology'.

'Government phonology' and its descendants (as described in Harris [1994], Kaye [1995], and Harris and Lindsey [2000], for example) have misinterpreted phonology in opposed directions, with, on the one hand, emphasis on the mysterious abstract properties, 'charm' and 'licensing', and 'empty' categories or positions, as well as a sense of 'government' that does not seem to relate to traditional (non-Chomskyan) usages, and, on the other hand, incorporating as phonological what are diachronic implementational phenomena such as fortition/lenition. As a slightly more recent variant ('CVCV') manifestation of this tradition, see e.g. Scheer (2004).

More positively, Anderson (1992a, 1992b: particularly §5.3) discusses syntactic phenomena he suggests to be analogous to phonological prosodies, as anticipated in Anderson (1965). But these are crucially different from phonological prosodies, in that while the 'implementation' of a putative syntactic prosody such as 'agreement' or 'tense' is grammatical, expounded within the grammar, phonological prosodies are implemented by articulation, and conveyed by the auriculary mechanism, i.e. extra-grammatically.

8 Conclusions

I have offered here (and see too Anderson [2014], if the reader is in the mood) a rather a baleful view of recent treatments of phonology and, indeed, their history; and it is little comfort that, as briefly expressed in the preface to Anderson (2022), the current state of investigations of syntax and lexical structure and change therein, is characterized, since the 'generative' disaster, by waves of informal contentious jargon, is even worse.

Phonology, I assume, is concerned with certain differences in perceived sound, contrasts that can differentiate among the expression poles of linguistic signs and sentences. The role of the phonologist is the location of systems of contrast. Some contrasts are associated with segments. But the set of such segmental contrasts varies with position in the syllable. And absence at one position of a contrast attested elsewhere can be said to involve neutralization of a contrast; the phonic quality of the neutralized segment may be more or less similar to one or both of those of the neutralized segment types, but it cannot be assigned to either phonologically. And some contrasts are associated with suprasegmental nodes, phonological or morphological or at the form or representational pole level of the sign; and beyond that there is association of tones with pre-utterance (implementation-ready) tonics.

Phonetics is concerned with the operation through time of vocal articulations and of the hearing mechanism, which can involve co-articulation and co-auriculation of prosodic contrasts with segmental contrasts, and their interaction. And there is no limit to the detail of articulation other than the audibility requirement, which may vary in different circumstances. There is no well-defined 'phonetic level' comparable with the various mental levels of linguistic representation associated with grammatical knowledge and use, though phonetics may contribute to speaker identification and in social identification.

And, as indicated above, assuming the non-grammatical status of phonetics is not to deny that articulation and our hearing apparatus don't have a crucial role to play in language change and, relatedly, in language acquisition, as well as there being phonetic phenomena that are not explored here (except in the mention of speaker identification), that convey non-grammatical information. The expression of some word forms may represent an attempt to mimic different natural noises, such as characteristic animal noises. Concerning effects on language change, however, certain combinations of segment types and of (subsegmental) features are easier to pronounce or hear differentially; these may be less or more relevant to particular languages, but they can be the basis of recurrent constraints. Hubmayer (1986), for instance, explores the potential phonetic basis for a range of phonological developments in English. These constraints can be in competition, however, and different choices made in different varieties of language; the constraints are violable, roughly as envisaged in segmental optimality theory (e.g. Lombardi [2001]) – though without our assuming that there is a currently well-defined universal set of them.

The constraints of optimality theory do not belong to phonology as such, though they may be reflected in prosodies such as that of 'place of stricture' in nasal + voiceless-plosive codas, as in English *hump/hunt/hunk*, though in violation of Pater's *$NC_{\circ}$ (1999, 2001). More insistently reflected in phonological structure, however, is the overall mechanism of the pulses of speech production, which results in the pervasiveness of some variant of the phonological skeleton that I invoked in my illustrations in §2, and our perception of relative sonority. This mechanism is also the basis for the typical differences between onsets and codas, for instance, as well as in the preferred locations for the development of lenition/fortition and of ambisyllabicity. But processes like lenition/fortition are themselves phonetic, unlike some of their potential results; and the nodes of the dependency skeleton, on the other hand, host phonological contrasts, as well as there also being non-phonological (morphological, lexical-item) domains for prosodies.

Reactions to my title have ranged from observations that what it claims is 'well-known' to an (implied) insistence that phenomena such as the spreading of

'harmony' and fortition/lenition and as-/dis-similation and the elusive notion of 'cliticization' and, indeed, 'sound-changes' in general are phonological (rather than implementational) phenomena with, certainly, possible consequences for morpho-phonological structures). Insistence that these phenomena are part of grammar, rather than (diachronic) phonetics is pervasive. This suggests to me that the phonology/phonetics distinction, and even, if you will, whether there is any, warrant some close attention, particularly (in my limited experience) in accounts of 'sound-changes' in English and its ancestors. Prosodies can have a prominent role in this, including in helping to express the limits of what it seems can be reconstructed. My present conclusion here is that both grammar and phonetics are disciplines that are concerned with language, but the former does not include the latter.

To me it is surprising that such a view has not been given proper attention in recent years: it is in essence not novel; it is, indeed, well-documented. Compare, for instance, Morpurgo Davies's account (1998: 248) of the view of Paul (1920: 15):

> given the absence of a collective mind or psychology and given the fact that minds cannot directly influence each other, the task of communication is given to the physical element of language, which has as its main function that of allowing contact between the two different psychological organisms and consequently guaranteeing continuity in time and space. It follows that any study of language will have to investigate both psychological and physical features. All sorts of conclusions depend on this: first, in Paul's view, the only possible analysis of psychological factors is through introspection; secondly, on the physical side, the most obvious factor is acoustic. It follows that in either case analysis must concentrate on contemporary speakers; the importance of living languages is re-emphasized once again. Even more important, since the content of *Vorstellungen* (ideas, representations) cannot be communicated as such, transmission of information requires by the receiver an act of re-creation, the results of which will depend on the mental and physical organization of each individual …There is a return here to Humboldt's creativity, but as much from the point of view of the hearer as from that of the speaker.

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