ON PHONOLOGICAL AMBIGUITY

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1. Within the phonological component of the theory of generative grammars problems of phonological ambiguity arise. A phonetic segment will be called phonologically ambiguous, if it cannot be decided on what the underlying abstract phonological (systematic phonemic) representation of this segment should be. This situation has to be kept strictly apart from that where a phonetic segment in some occurrences will be assigned one abstract representation and in some other occurences another. In this case, there will be a unique abstract representation of each occurrence of the phonetic segment, and by applying the phonological rules the phonetic segment will be generated correctly from the postulated abstract representation. In the case of phonologically ambiguous segments there will be more than one abstract representation of the segment from which it can be generated correctly by applying the phonological rules. The reduced vowel in English provides a good example. The vowel of the last syllable of words like *constitution, relaxation, division* allows for more than one abstract representation, all of which would yield the correct and expected results.[1]

2. Before continuing with the discussion of this problem I want to comment briefly on the notion of ambiguity. It has been among the particular concerns of the theory and practice of generative grammar to provide descriptions and explanations of syntactic and semantic ambiguities. A given sentence is called ambiguous if it admits of more than one interpretation. Two or more sentences may be identical on the surface but differ in meaning because they are derived from different underlying phrase-markers. This is called *syntactic ambiguity*. Consider, e.g., the sentence:

The police were ordered to stop drinking after midnight.

Two or more sentences may be identical in surface structure but differ in meaning because more than one lexical reading may be associated with one or more than one

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[1] There seems to be nothing in print on this matter. I can only refer the reader to Chomsky's remark that the occurrence of the reduced vowel "can largely be predicted by extension of the transformational cycle" (Noam Chomsky, "Topics in the Theory of Generative Grammar", in Thomas A. Sebeok [Ed.], *Current Trends in Linguistics*, vol. III [The Hague, 1966], p. 56).

of the terminal elements of their underlying phrase markers. This is called *semantic ambiguity*. Consider, e.g., the sentence:

John prefers light beer.

In both cases of syntactic and semantic ambiguities, the ambiguity will be resolved, that is, with each meaning of an ambiguous phrase there will be associated a unique syntactic description and a unique semantic interpretation.

Thus, phonological ambiguity as described here differs from syntactic and semantic ambiguities in that it is not resolved.

3. Consider the case of some Gothic vowels. Ronald E. Buckalew[2] presented a generative morphology of Gothic where each occurrence of the segment $[\varepsilon]$ is generated from an underlying i, e, or from the sequence ai, each occurrence of the segment $[\mathfrak{o}]$ is generated from an underlying u, o, or the sequence au. I use letter notation as an abbreviative device instead of feature matrices. Here, I will dicuss the derivations of $[\varepsilon]$ from i or ai, and of $[\mathfrak{o}]$ from u or au, only. As time does not permit I cannot relate these statements to traditional phonemic analyses of Gothic.[3] In the analysis refered to, $[\varepsilon]$ and $[\mathfrak{o}]$ usually have as their abstract representations i and u, respectively, when they occur before r, x, x^w, in other cases they will be represented as ai or au. This analysis is based on alternations like *bai—bajoþs, mawi—maujos*. Apart from some marginal exceptions, which I shall disregard, there are some systematic ones. They occur, for instance, in the past tense of the irregular (strong) verbs.

Consider the following verb forms. The table gives in the first column the graphemic notation in a modern transliteration, in the second column the assumed phonetic reading, in the third column, their abstract representations.

1 sg. past	gataih	gatɛx	gataix
1 pl. past	gataihum	gatɛxum	gatixum
1 sg. past	tauh	tɔx	taux
1 pl. past	tauhum	tɔxum	tuxum

As stated above, there are rules that convert i's and u's before x into $[\varepsilon]$'s and $[\mathfrak{o}]$'s of the phonetic representation. There are, as far the problem under discussion is concerned, no environments specified for the rules that apply to ai and au. They will be converted into $[\varepsilon]$'s and $[\mathfrak{o}]$'s of the phonetic representation in all instances. This means that the abstract representations notated as *gataix* and *taux* could, as well, be notated *gatix* and *tux*, and vice versa. The correct phonetic representation would be generated all the same. Now, in this case, there are rather strong motivations to adopt the abstract representation as given in the table above. By these motivations the ambiguity is resolved. It is known that verbs belonging to the same classes but

not containig x (or r or x^w) as stem final consonant display the same alternations $ai \sim i$, $au \sim u$ in the past tense.

1 sg. past	graip	grɛp	graip
1 pl. past	gripum	gripum	gripum
1 sg. past	bauþ	bɔþ	bauþ
1 pl. past	budum	budum	budum.[4]

This systematic correspondence justifies the representation of ⟨gataih⟩ as *gataix* and of ⟨tauh⟩ as *taux*, the representation of the plural forms ⟨gataihum⟩ and ⟨tauhum⟩ as *gatixum* and *tuxum*.

4. One will notice that the abstract representations are, by and large, the forms one would reconstruct for pre-stages of Gothic. Thus, the analysis would support the claim made by generative phonology that the abstract representations change much more slowly than the surface phonetic representations.[5]

There are other cases that cannot be resolved this way. The past tense verb forms show that the segments ε and $\mathfrak{o}$ before r, x, and x^w may have i and u, or ai and au as their abstract representations. In cases like the noun ⟨baur⟩ [bɔr], the adjective ⟨gaurs⟩ [gɔrs] 'sad' there is no way to decide whether au or u should be the abstract representation, except by appealing to etymology which is not allowed. The same is true of the reduplicating syllable occurring in the past tense of a certain class of verbs and consisting of the initial consonant (or consonant cluster in some cases) and the vowel $[\varepsilon]$ as in *hvopan—haihvop, letan—lailot*. As far as the rules have been stated, $[\varepsilon]$ in *lailot* should have as its abstract representation ai, $[\varepsilon]$ in *haihvop* i or ai, without a possibility of deciding between both solutions. Historically, in both cases, $[\varepsilon]$ is to be derived from $*i$. The representations ai and i for $[\varepsilon]$ in *haihvop* are arbitrary, $[\varepsilon]$ is phonologically ambiguous. Historically, this means that Pre-Gothic ai and i have merged not only on the surface but also on the abstract phonological representation.

5. Two contrasting conclusions seem possible. If we admit descriptions containing phonological ambiguities, this would allow in the Gothic example to analyze, among other things, paradigms like ⟨gataih⟩—⟨gataihum⟩ in the same way as ⟨graip⟩—⟨gripum⟩, and by this we would retain a maximum of generalization on the behavior of verb classes.[6] This description of Gothic, however, would contain a number of forms unique abstract representations of which could not be stated, the grammar would contain two (or more) alternative abstract representations on the status of

[2] Ronald E. Buckalew, *A Generative Grammar of Gothic Morphology*, Diss. Urbana, Illinois, 1964.

[3] For bibliographical references see my paper, "The Pre-Gothic Monophthongizations and Wulfila's Graphemic System", (to appear).

[4] Phonetic and phonological representation as *budum* would be acceptable as well.

[5] Cf. Morris Halle, "On the Rule of Simplicity in Linguistic Descriptions", in Roman Jakobson [Ed.], *Structure of Language and its Mathematical Aspects* (Providence, 1961), pp. 89—94; idem, "Phonology in Generative Grammar", in Jerry A. Fodor and Jerrold J. Katz (Eds.), *The Structure of Language: Readings in the Philosophy of Language* (Englewood Cliffs, New Jersey, 1964), pp. 347, 351f.

[6] On generalization cf. Chomsky, l. c., pp. 49 ff. (with literature).

which only arbitrary statements could be made. Alternatively, one would not allow for generalizations beyond a point where phonological ambiguities arise in consequence of such generalizations. Such a grammar of Gothic would generate all segments [ɛ] and [ɔ] uniquely. (This abstract representation would be, by the way, closer to the phonological anlysis of Gothic which is now more and more accepted.) Some subparts of the grammar, e.g. verb morphology, would contain less generalization. And in this part, the grammar 2 would also deviate from traditional textbooks, as they present the same historical analysis that is preserved in the alternative grammar 1 with a maximum of generalization.