Tonal Accents in Low German
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James Matisoff in his 1970 paper on glottal dissimilation and the Lahu high-rising tone has suggested that, if it could be proved that tonal contrasts are always secondary developments in the history of languages, it would be of the greatest typological interest. His examples from Lahu phonology show the complex tonal system in that language to have arisen from purely segmental circumstances. I will argue in this paper that the origin of the tonal accents in Low German and in the Scandinavian languages can be explained on the basis of segmental circumstances as well, and that they may be considered as secondary in the historical development of these languages. In Matisoff's analysis of Lahu, he concludes that it is the initial and/or final consonant which triggers the development of tonal contrasts and that such consonants are those segments which are most susceptible to change or loss. I will argue that in Low German and Scandinavian languages the segmental circumstances involve only vowels and diphthongs and that it is the redundant tonal transition in centering diphthongs which becomes distinctive when such diphthongs monophthongize. The sources of the centering diphthongs themselves will be looked for in terms of changing timing of disyllabic sequences.

I will examine the evidence in Low German dialects since the data offers what appear to be several intermediate stages in the process of tonogenesis. Parallel or similar developments in Scandinavian languages will be mentioned where appropriate.

Tonal accents in Low German dialects have attracted more attention from dialectologists than other linguists, perhaps because they are not as spectacular as the Danish stød or the musical accents of Norwegian and Swedish. The tonal accents of Low German occur in the North Saxon dialects of the Lower Elbe, that is, those nearest Denmark. The grammars call these accents "overlong" or Schleifton. Seelman describes them as involving a steep pitch drop in the vowel which he expresses in musical terms as at least a major third.

Within the grammar, the accents occur before final voiceless lenis sounds, namely, /v, z, d, g/ or a vowel in monosyllabic morphemes which have suffered apocope. The vowel which carries the Schleifton was originally long or lengthened in an open syllable before apocope occurred. Keller considers the Schleifton to be an allophone of the lost final reduced vowel since it "occurs in dialect where New High German, with which all speakers are conversant, has schwa." Schleifton can occur before fortis consonants only if these consonants do not belong to the same morpheme; therefore, in verb forms which have

suffered syncope the tonal accent occurs: 1st sg. pres. ik gääv' 'I give', 1st pl. pres. wi gääv't 'we give', 2nd sg. pret. du bleev'st 'you stayed', etc. (The apostrophe indicates the presence of Schliefton).

In terms of morphological categories, the tonal accents can occur in the singular of many feminine nouns of the ô- and n-classes, the singular of a few masculine n-class nouns, the plurals of many nouns with a former -e suffix, in some adjectives of the former ja- class, in some words with a former adverbial ending in -e, and in some verbal forms as already mentioned.

It would seem from this description, taken from Keller, that the tonal accent is a compensation for the final vowel lost in apocope. However, there exists other data which suggests that the solution is not quite so simple.

In Erich Seelmann's 1908 description of the Low German dialect of Prenden, spoken near Berlin, he notes that the tonal accent is optional: it arises in emphatic or excited speech and occurs when a centering diphthong is monophthongized, especially before nasals and liquids. In the Prenden dialect apocope has not occurred so that the tonal accent cannot be said to be a compensation for a lost final schwa or other vowel. There also exist a number of Frisian dialects, spoken on the north coast and in the northern coastal islands of The Netherlands, which have the Stosston in open-syllable lengthened vowels in words without apocope. It may also be noted that in the Jutish dialect of Danish described by Ringgaard the stød alternates with a schwa vowel in apocopated words. It seems clear that those dialects which have centering diphthongs do not have tones while those which have monophthongized these centering diphthongs do have tonal accents or stød. Clearly there must be a relationship between these phenomena.

Since centering diphthongs are contrastive in the Prenden dialect, as in many other dialects where they occur, it seems clear that they acquire tonal accent when monophthongized in order to continue to contrast with those long monophthongs with which they would otherwise merge. A similar development has taken place in the South Dutch dialect of Maaseik where short vowels lengthened in open syllables contrast by tonal accent to the old long vowels which do not have any tonal accent.

Observations of the correlation between tonal accents and short vowels lengthened in open syllables led Erich Seelmann to propose a solution to the problem of open-syllable lengthening in order to explain the tonal accents. He hypothesized that in disyllabic sequences with one medial consonant, i.e., when the first vowel was in an open syllable, the "end syllable accent weakened," causing the "accent" in the first vowel to become a Schleifton, after which a schwa-like "overshort" vowel appeared at the end of the first vowel, leading to the formation of a

full long vowel or a centering diphthong. Agathe Lasch in her Middle Low German grammar essentially follows the same line of reasoning.

Open syllable lengthening of short vowels occurred in all the Germanic languages in varying degrees. The primary difficulty in explaining open syllable lengthening is that CVCV words in older stages of Germanic appear to be stable, yet in later stages the first vowel is lengthened. Since the word accent is assumed to occur on the first syllable of native Germanic words and the position of the accent has not changed in CVCV words with lengthened first vowels, there seems to be no very clear phonetic explanation for the development. Peter Skautrup, writing about Danish, proposed that the lengthening was caused by a change in timing of the sequence such that the second syllable lost duration which was acquired by the first vowel. Seelmann seems to recognize that the reduction of the second vowel is related to the lengthening in his remark about the "weakened accent of the end syllable." English scholars such as Richard Jordan also suggested that the reduction of the final vowel was involved; however, along with most scholars of Germanic languages, he conceived of the relationship as an "increasing force of the accent" on the first vowel, that is, the accentual force of the second vowel was somehow transferred to the first vowel, causing it to lengthen.

Although "increasing force of the accent" is too vague a formulation to be useful, the phrase does suggest that we should look to the internal organization of CVCV words for a solution to the problem. Recent work by Ilse Lehiste suggests that such internal organization does exist in terms of stable vowel duration ratios in disyllabic words. In her 1971 article on the temporal organization of speech, Lehiste reports on a study indicating that in English the vowel of a CVC sequence is more closely related to the following consonant than to the preceding consonant in terms of negative correlation. Negative correlation is defined as holding between the durations of two successive segments if an error is made in the duration of one segment and the error is largely compensated for in the following segment. Such negative correlation "suggests that articulatory events are programmed...not in terms of single phonemes, but in terms of higher-level articulatory units."

Lehiste also studied disyllabic sequences, using the words steady, skiddy, skitty, spoken in the Midwestern variety of General American where the medial consonants would be normally pronounced with a flap. In these words the flap could not be said to be more closely related to the preceding or following vowel, based on negative correlations. Since Lehiste interprets the medial flap itself to mean that the articulatory program of such disyllables must obligatorily encompass the whole CVCV sequence, the negative correlations appear to be a

confirmation of that assumption.

More important to the argument of this paper is Lehiste's discovery of a constant vowel duration ratio, i.e., a negative correlation between the vowels of the CVCV sequences skiddy/skitty, even though skiddy was longer in absolute duration than skitty due to the voicing of the underlying medial consonant. Lehiste says, "The duration of the second vowel is adjusted to the duration of the first, and the sequence of two vowels constitutes a unit of programming at some higher level." In brief, she has discovered the principle of internal organization of disyllabic sequences in English.

If we extend Lehiste's discovery to the analysis of the problems involved in open syllable lengthening, we find it to be very useful.

First: We can see at once why the formulation of the change in length in open syllables as a function of accent was unsatisfactory. Accent, in itself, although it has been recognized as an organizing principle by Galton and Ladefoged, cannot tell us how a sequence subordinated to accent is organized. It should really be considered a "cover term" denoting groups of other features as suggested by Ladefoged in discussing the hierarchy of features in general.

Second: Lehiste's discovery gives us a positive and measurable means of testing Skautrup's hypothesis about a change of timing in disyllabic sequences that acquire open syllable lengthening. It certainly seems more useful to consider the change in terms of duration than in terms of "increasing accent force." If CVCV sequences are organized as a single unit of articulatory programming, then internal changes in vowel duration ratios will involve changes in the negative correlations, i.e., compensation will occur in one segment or the other. Lindblom (quoted by Lehiste, 1970) in working with Swedish, suggests that vowel reduction is due to timing, i.e., that a lack of sufficient duration results in the vowel in question being unable to reach its target of height and tonality. Although Lehiste remarks that Lindblom's hypothesis does not account for certain differences in quality between vowels in stressed and unstressed syllables in languages like Russian, the hypothesis may be viable for short vowels in open final syllables, that is, for the second vowel in CVCV words. I am not considering the possible motivation for a change in timing but it should be observed that loss of length in final syllables is characteristic of Germanic languages, including Gothic. Gothic, for example, has short final vowels corresponding to long final vowels in Indo-European and has no final vowels in words with short final vowels in Indo-European.

Third: The discovery of vowel duration ratios suggests a phonetic explanation of vowel lengthening itself. The concept of what actually happens when a vowel lengthens has not been

clear: How does a vowel lengthen? By simple prolongation? If so, when is the lengthened vowel recognized as distinctively long? How important is quality? What about the former contrast between long and short vowels in open syllables which lengthening obscures?

That the contrast of long and short vowels in open syllables remains important after open syllable lengthening occurs may be inferred from the development of the vowel systems of Germanic dialects: in the very conservative Westphalian dialects of Low German old long vowels and lengthened vowels still contrast. The lengthened vowel reflexes are centering diphthongs while the old long vowels have diphthongized with high closing finals, e.g., iu, ui, ai, au, etc. The same development occurs in Faroese dialects. In the West Norwegian dialect of Aurland the lengthened vowels are monophthongs but the old long vowels are diphthongs. In Frisian dialects the lengthened vowels are monophthongs with tonal accent or Stosston while the old long vowels are monophthongs without tonal accent except in exceptional circumstances. In the Dutch dialect of Maaseik the distinction between old long and lengthened vowels is maintained solely by tonal accents versus lack of tonal accents. In the North Saxon dialects the analogy would seem to break down since any vowel - old long or lengthened - which occurs before a final lenis unvoiced consonant has the tonal accent. However, since the same development occurs in dialects of Franconian, it appears that the identification of certain old long vowels with the lengthened short vowels in positions which are reflexes of old open syllables is a secondary development, according to Wiesinger. In English it is inferred that the vowels lengthened in open syllables were at first phonetically distinct from the old long vowels with which they later merged since, according to Dobson, careful Middle English poets such as Chaucer and Gower avoided rhyming long and lengthened vowels.

If we maintain that the lengthened vowels were necessarily phonetically distinct from the old long vowels because the contrast continued to be important, we must surmise how this contrast could be maintained in the face of changing negative correlations. Based on the conservative dialects of Westphalia and the Faroe Islands, the transition dialect of Prenden, and the tonal dialects of North Saxon, I suggest the following development. When the timing of the CVCV sequence changed for reasons that will not concern us, it appears that the final vowel lost duration. I suggest that the initial vowel compensated for this lost duration by delaying termination of the vowel by the addition of a schwa-like neutral speech sound, thus preserving the shortness of the distinctive vowel quality while accommodating the change in length of the second vowel. Since vowels have intrinsic pitch, the change in pitch between the distinctive portion of the lengthening vowel and its schwa-

like final portion would be a redundant accompaniment of the centering diphthong which this process created. Therefore, when the centering diphthong monophthongized, the redundant pitch change between the two components of the diphthong could become distinctive in order to continue to maintain the contrast of old long and lengthened vowels.

It has been suggested by Ringgaard that the pitch change is caused by a retraction into the first syllable of the original pitch change between the first vowel and the second reduced vowel in Danish words with apocope. However, this explanation would not fit the situation in Prenden where the centering diphthongs acquire tonal accent when monophthongized, whether or not there is a reduced vowel in the next syllable. Further, in Prenden the lengthened vowels have merged in the centering diphthongs with low-mid initial component while the centering diphthongs with high first component are reflexes of MLG eu and ô; therefore, it would appear that it is the structure of the diphthong itself, not the environment, which determines the appearance of the tonal accent. This analysis is dependent, of course, on the assumption that those vowels with which the new monophthongs would otherwise merge do not change their quality or their quantity (which is the situation in Prenden).

Since the first indication in documents that open syllable lengthening in Low German has occurred appears in the 12th century, I would like to account for the stability of the centering diphthongs in dialects such as those of Westphalia. It is known that the North Saxon dialects were once also characterized by centering diphthongs which monophthongized in the 16th century. I suggest that with the appearance of the schwa-final in the first vowel in response to the reduction of the second vowel to schwa, the two schwa elements became related by a new vowel duration ratio which stablized the new sequence of lengthened vowel plus reduced vowel and thus prevented apocope. On the other hand, in North Saxon where apocope has occurred, I suggest that as the final vowel further reduced in duration, the redundant pitch change in the centering diphthong of the first syllable became increasingly prominent and began to substitute for the centering diphthong. As the final reduced to zero, the pitch drop in the first syllable intensified until, in Danish and Frisian dialects, the final pitch level of the falling tone became low enough to cause laryngealization: thus, the stød or Stosston came into existence. That the development to stød is not a necessary stage is shown by the apocopated words in North Saxon which still have steeply falling tonal accents. The fact that centering diphthongs in Prenden can monophthongize with accompanying tonal accent suggests that apocope may be developing optionally in the dialect although Seelmann doesn't mention such a development.

Is it possible to extend this analysis to the tonal accents

of Norwegian and Swedish? I think it can be done.

First, we notice that it is the East Norwegian and the Central Swedish dialects which have the distinctive tonal accents. Northern Norwegian dialects, Finnish dialects of Swedish, Icelandic, Faroese, and possibly the Western dialects of Norwegian do not have these tonal accents. Second, these tonal accents occur only in words of more than one syllable and in only those words which in Danish can never have stød but, in isolated dialects of Southeast Jutland, can have tonal accents. Third, Icelandic, Faroese, and the Western dialects of NOrwegian have extremely complex diphthongization patterns while in the dialects of East Norwegian and Central Swedish which have the tonal accents, the old long vowels and the lengthened vowels are monophthongal. Fourth, it is the East Norwegian and Central Swedish dialects which acquired "syllable balancing", i.e., the development of CVCV words with a kind of vowel harmony between the vowels which apparently made such words quite stable.

How can we relate these facts to the development of tonal accent from the pitch changes within a centering diphthong? I suggest that the Norwegian and Swedish dialects with tonal contrasts may have developed them in response to the loss of length in the second syllable of a heavy disyllabic sequence rather than the loss of length in the second syllable of a light disyllabic sequence as in Danish, North Saxon and Frisian. Although the tonal accents are generally assumed to have been present in Old Norse in polysyllabic words, there is no clear explanation for the lack of these accents in the most conservative modern representatives of Old Norse, namely, Icelandic and Faroese. Some linguists have proposed that the tonal accents arose as a result of the loss of length of the second syllable, i.e., the syllable following the initial accented syllable, but have not proposed a phonetic implementation of the change.

I suggest that after the period of syncopation (ca. 900 AD) brought a heavy first syllable into juxtaposition with a second heavy syllable or a sequence of two light syllables, a duration ratio was established between the two elements. Benediktsson expresses this relation by saying that the first syllable had primary stress and the second syllable had secondary stress. When the duration of the second element (either a heavy syllable or a sequence of two light syllables) was reduced, the vowel of the first heavy syllable responded by delaying termination in the same way as in light disyllabic disturbed sequences, i. e., by acquiring a schwa-like final. Since those dialects which developed tonal accents in these positions also had developed "syllable balancing" where optimal vowel duration ratios tended to delay final vowel reduction in CVCV words, the retention of a tonal reflex of former heavy disyllabic sequences was not hampered. It follows, then, that heavy sequences contrasted

with light disyllabic sequences in the original language but that later changes in the duration of final elements of these phonological units discouraged the retention of the original contrast in terms of tonal accents since such a retention would require three accents: one for the heavy sequence, one for the light sequence, and one for monosyllables. That such a development was not impossible is illustrated by the existence of three accents in the Norwegian dialect of Oppdal where apocope is occurring in a tonal dialect and in isolated dialects of Danish in Southeast Jutland which have plain accent, stød, and tonal accent in contrast.

In summary, my argument not only proposes that the tonal accents of Low German, Frisian, Danish, Norwegian and Swedish are secondary developments, it also pinpoints the development in terms of specific segmental conditions, i.e., the rise of distinctive tonal accent from the redundant pitch change of a centering diphthong when it is monophthongized. Therefore, the explanation of these accents parallels that of Matisoff in his analysis of Lahu tonogenesis except that it deals with the interrelationships of vocalic elements instead of the interrelationships of vowels with consonants.

In addition, the development of tonal accents in Germanic dialects offers support for Ilse Lehiste's theory of phonological units larger than the syllable. If such phonological units exist, they may be expected to take part as such in historical change. If we look at the tonal accents of Norwegian and Swedish as reflexes of former heavy disyllabic sequences and the stød and tonal accents of Danish and Low German as reflexes of former light disyllabic sequences, we have in effect proved her point.

Finally, the analysis has been made without recourse to the concept of stress, but only in terms of changing duration and changing pitch or fundamental frequency patterns. Therefore, the analysis offers support for the proposal of Ladefoged that some features act as "cover terms" for groups of other features.

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