

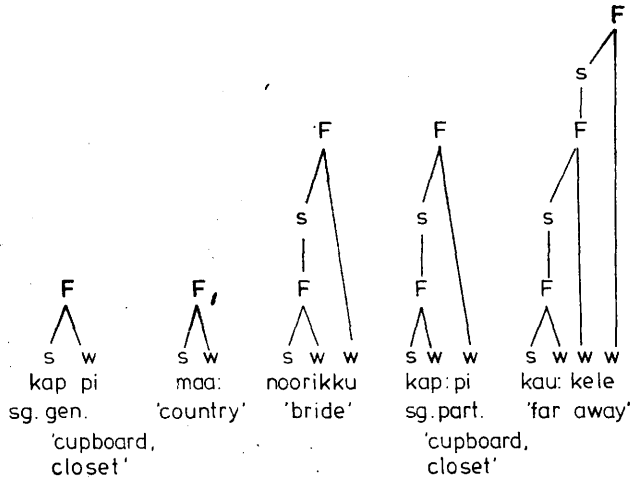
## Adjacent Stresses in Relation to Overlength

0. Clarification of the phenomenon of three degrees of length within the framework of metrical theory has recently been attempted by A. Prince (1980). His investigations focussed on the systematic properties of the third (overlong) degree (henceforth Q3) in the light of a foot-based theory. These systematic properties, as Prince describes them, are seven in number: i. Q3 occurs only in stressed syllables; ii. any final syllable that bears word-stress is overlong (from this it follows that all monosyllables are overlong); iii. a Q3 syllable seems to invite an immediately following stress; iv. from the sequencing constraints of Q2 and Q3 segments (I. Lehiste 1965), it follows that overlength is a phonological property of syllables. In Prince's framework overlength is a metrical property of syllables; assuming that the nuclear tone is realized over the unit foot, the foot-hood of the Q3 syllable captures the whole contour; vi. in grade alternation the principal effect of the strong grade is to assign foot to syllables (syllables with complex rhymes — VV, VC, VVC — will end up overlong); vii. the appearance of Q3 in the weak grade, in the case of conflation (loss of medial C gives  $\# [F[\sigma CVV]]$ ), becomes understandable (536—537). Prince's conclusions, which are based upon a thorough analysis of Estonian quantity relations, affirm that these systematic properties of Q3 are the consequences of the fact that Q3 syllables are feet in metrical structure. This follows directly from the essential assumption of the metrical theory of stress (M. Liberman & A. Prince 1977). According to this, distinctions of relative prominence reflect the binary branching relational structure that organizes a string of syllables into a hierarchy of phonological units (Prince 1980: 518). A foot (or a stress-foot, cf. Selkirk 1980) is a metrical category intermediate between the syllable and the word.<sup>1</sup> Within the foot the metrically strongest syllable is stressed (Prince 1980, 522).

0.1. To exemplify the metrical structure of Estonian words, Prince's examples (529—30) are reproduced as on p. 46.

From a study of these structures it becomes evident what it is that constitutes the difference between various degrees of length. For certainly Q3 is the metrically strongest syllable; it is a foot (not only part of a foot) and naturally occurs in the stressed syllables only. In addition Prince formulates the attractive and convenient Basic Grade Principle rule, which is supposed to account for the fact that although F (foot) generally tends to be disyllabic, in this spe-

<sup>1</sup> E. Selkirk (1980) refers to these as prosodic rather than metrical categories, cf. pp. 563 fn.



cial grammatical condition (strong grade) it is forced to be monosyllabic (538):

#### *Basic Grade Principle*

For M (= „word”) in the Strong Grade the strongest syllable is F.

That is, in Estonian Q3 appears in the strong grade; in Lappish, the grammatical condition for the formation of a monosyllabic F is somewhat different, as we shall see shortly.

1. As Prince's main concern is to advance a plausible explanation of the various (above mentioned) properties of Q3 as a consequence of the metrical structure of the Estonian words, he does not consider it necessary to go into details as to how these metrical factors actually enter the morphophonology of the grammar. This is to be seen, for example, in the above BGP rule, in which the question as to where and when to assign this rule, remains deliberately unanswered. Prince merely states (without going into details): „We will assume that the BGP is true of a very early stage of phonological derivation” (539).

1.1. What follows below is an attempt to utilize, in the area of morphophonology, Prince's fascinating findings concerning the most likely universal properties of Q3 stemming from its metrical characteristics. It will be argued that there are good reasons for assuming that, in Lappish, occurrences of Q3 are conditioned directly by prosodic rather than grammatical factors. This assumption will be elaborated on the basis of the reinterpretation of the third systematic property of Q3. It will be pointed out that an examination of Lappish data, concerning the distribution of Q3 syllables, rather suggests that it may be necessary to devise an essentially different interpretation of the above mentioned systematic property of overlength concerning the directionality and interdependency of the main stress in the Q3 syllable and that of the stress in the following syllable.

2. The clearly observable three-way contrast in length, both in Estonian and Lappish, has for a long time obliged linguists to seek an explanation beyond the segment. The fact that distributions of length reflect syllabic rather than segmental features was expressed by V. Tauli (1954, 1968, 1972). I. Lehiste claims in several works (particularly 1965, 1970, 1978) that it is essential to recognize the phonological hierarchy of segment, syllable, two-syllable unit and word, in order to understand the distribution of the various quantities in Estonian. The idea of the disyllabic unit occurs also in E. Itkonen's thesis on analysing Lappish quantity relations (1946).<sup>2</sup> In his article P. Ravila (1961) indicates the basic differences between Finnish and Lappish, concerning the quantitative characteristics of these two languages. Again, his conclusions point in the same direction.<sup>3</sup>

2.1. The new approach expressed by Prince, in his hypothesis concerning metrical theory, has benefited a great deal from previous research which has sought to find explanation for quantity distributions beyond the segment. However, his foot-based theory is essentially different in two respects. First, it would assign a different content to these disyllabic units, in seeking to explain their behaviour pattern on the basis of their metrical structure. Thus I. Lehiste's correct assumption concerning these disyllabic units, with the recognition of the significance of the special metrical structure, the foot, gives these disyllabic units a deeper content. Second, it represents a totally different approach; for while the former assumptions are conceived in a „bottom-up” fashion, Prince asserts the validity of the contrary direction, arguing that a higher order analysis need not depend on the completion of a lower order analysis (Prince 1980, 556—557). This amounts to recognizing the role and significance of the unit foot as a very early stage of phonological derivation.

To relate these questions to the phenomenon of three degrees of length in Lappish should thus prove to be of considerable interest.

<sup>2</sup> »In bezug auf den Stufenwechsel müssen wir also konstatieren, dass die gegenseitigen Beziehungen des Vokals und des nachfolgenden Konsonantismus auf der Grenze der ersten und zweiten Silbe prinzipiell andere als auf der Grenze der 2. und 3. Silbe sind. Hätten im letzteren Fall Vokal + Konsonantismus ein ähnliches festes Ganzes wie im ersteren Fall gebildet, so hätte der auf den Vokal der 2. Silbe folgende Konsonant immer im Stammkonsonantismus die schwache Stufe ausgelöst, also auch dann, wenn die 2. Silbe offen war. In die Ursachen dieser Doppelheit wollen wir uns hier nicht vertiefen — die Aufhellung der Frage setzt eine Lösung aller mit der ursprünglichen finnisch-lappischen Akzentuation verknüpften Probleme voraus —; jedenfalls dürfen wir es wohl als ausgemacht betrachten, dass die starke Stufe vor einem auf der Grenze der zweiten und dritten Silbe stehenden Einzelkonsonanten zunächst darauf beruht, dass der genannte Konsonant, wie man es aufgefasst oder empfunden hat, den Vokal der dritten Silbe verdeckt und den Vokal der zweiten Silbe offen lässt, mit anderen Worten auf der Silbenteilung, die nach der Ansicht Panconcelli-Calzias eine blosse Erdichtung ist« (pp. 17). I. Lehiste (1965) regards E. Itkonen's interpretation as providing support for the theory advocating the recognition of the psychological reality of the importance of these disyllabic units.

<sup>3</sup> „Puhtaassa kvantiteettikielessä ei voi esiintyä enempää kuin kaksi fonologisesti relevanttia kvantiteettiastetta. Jos kuitenkin äänteen kvantiteettiaste on liittynyt painoon sekä sävelkulkuun ja jos se lisäksi on kiinteässä riippuvuussuhteessa erityisesti seuraavan tavun kvantiteettiin, voi muodostua kolmekin erilaista kvantiteettistruktuuria, jotka ovat foneemisessa oppositiiossa toistensa kanssa. Tällöin ei kuitenkaan ole ratkaisevana tekijänä yhden foneemin kvantiteetti, vaan kokosestrukturi, jonka osana se on” (my emphasis; pp. 350).

3. Consonant gradation in Lappish extends to all consonants and consonant clusters.<sup>4</sup> The gradation can be quantitative and/or qualitative, though mainly the former. These word-internal changes occurred as direct consequences of the fact that the following syllable was closed or open. It has long been clear that the reasons for the gradation phenomenon are basically prosodic.<sup>5</sup>

In Lappish, just like in Estonian, the original phonetic environment of the gradation has undergone drastic change. However, the gradation processes survive and play an essential role in the grammar of both of these languages.

3.1. The occurrence of Q3 can be observed today in the Pite, Lule, Norwegian, Inari and Skolt-Lappish dialects.<sup>6</sup> Lappologists have long recognized that this overlong grade is not organically related to the alternations of the strong (resulting in Q2 length) and weak (representing Q1 length) grades. While the alternations of these two latter grades, as pointed out above, are historically related to the closeness vs. openness of the following syllable, the occurrence of the overlong grade is connected with the phenomenon of contraction. Whether the appearance of the overlong grade can be traced back to the Old Lappish period is questionable.<sup>7</sup> What is important synchronically, though, is that the occurrence of the overlong grade plays a noticeable part in the alternation of consonant length; together with the differently originating consonant gradation process, it plays an important role in the morphophonology of the above mentioned Lappish dialects. We will now take up the question as to whether the occurrences of Q3 synchronically are due to the operation of not grammatically but prosodically motivated rules.

4. Before going into details concerning the crucial significance of the prosodic factors in connection with the occurrences of Q3, let us first point to one of the difficulties to be faced during the course of a segmental analysis in relation to the applicability of a phonological rule, while also giving some indication of its applicability in relation to wordinternal quantitative factors.

4.1. In Skolt-Lappish there is a general rule which affects wordfinal short vowels. The operation of this rule results in either the reduction or the dropping of the vowel in question. As the conclusions to be drawn from this phonological process are not affected by whichever way the rule operates, for the sake of simplicity let us formulate here the apocope rule only (which, of the two, seems likely to be the more frequent, cf. Korhonen et al. 1973).

(1)

$$\left[ \begin{array}{c} V \\ + \text{ short} \end{array} \right] \rightarrow \emptyset / \text{ \_\_\_\_\_\_ } \#$$

<sup>4</sup> There is no gradation in South-Lappish dialects.

<sup>5</sup> «Die auf die hauptbetonte Silbe folgende Silbe hat, wenn geschlossen, stärkeren Druck gehabt, als wenn sie offen war, und diese der geschlossenen Silbe zuteil gewordene Steigerung der Intensität hat als Kontrasterscheinung im Anfangsteil des Phonems eine Schwächung der Intensität bewirkt, die sich darin äusserte, dass das zwischen den Silben stehende konsonantische Element schwächer und unvollkommener artikuliert wurde als vor offener Silbe» (E. Itkonen 1946, 1).

<sup>6</sup> M. Korhonen 1969, 236.

<sup>7</sup> See Korhonen (1969, 237) for literature on the history of overlength in Lappish.

E.g. *kie'tt* 'hand' from underlying /kie'tta/<sup>8</sup>, *kõll* prs. sg. 3. 'hear' from underlying (kulla),<sup>9</sup> *kõg'tt* 'Lappish tent' from underlying (koa'tte). This is a phonetically well-motivated, productive rule. However, there are surface strings with a wordfinal short vowel which seem to be unaffected by this general rule, e.g. *kie'tte* sg. ill. 'hand', *ku'lle* impf. pl. 3. 'hear', *kõä'tta* sg. ill. 'Lappish tent'. As these would appear to be obvious candidates for undergoing the apocope rule, that they fail to do so requires explanation.

4.1.1. During the course of a segmental analysis, there are at least two approaches among attempts to account for those wordfinal short vowels not undergoing this general rule. According to the first approach, as rule (1) affects only wordfinal short vowels, it might seem obvious to assume that all of these surface vowels not subject to this rule are underlyingly long. This assumption would entail either (i) a restriction of the rule, so as to make it applicable only to non-derived short vowels, or (ii) positing a vowel shortening rule affecting underlying long vowels before the application of the apocope rule. Both of these conditions would unnecessarily obscure the naturalness of this general rule. According to the second possible approach, the rule is morphologically conditioned, and thus will not apply in the sg. ill., impf. pl. 3. etc. Neither of these possibilities is persuasive, however; besides, they fail to take into account the apparent coincidences between wordinternal quantity relations and the applicability vs. non-applicability of the apocope rule. To accept either approach would mean failing to recognize differences between the relevant wordfinal vowels from a quantitative point of view. Such differences are important, because they may be seen as pointing toward significant correspondences suggesting interdependencies between wordinternal quantitative relations and those wordfinal vowels not undergoing rule (1).

4.1.2. A closer inspection of the morphemes with wordfinal vowels not undergoing this rule reveals a striking fact, one to which there is no exception: namely, that all of these morphemes have a Q3 syllable preceding the final syllable which contains the vowel resistant to rule (1). One of Prince's observations concerning one of the systematic properties of Q3 comes to mind (specifically, the third): that Q3 appears to invite an immediately following stress. Thus in accordance with Prince's observations, a Q3 syllable attracts secondary stress in the syllable immediately following. There is then some basis for assuming that the reason why rule (1) does not apply on the string *kie'tte*, for example, must be connected with the different distribution of stress, in comparison with /kie'tta/ where the last syllable is stressless. In Skolt-Lappish, the main stress falls automatically on the first syllable in non-compound words. In words with two or more syllables the last syllable has weak secondary stress, while the other syllables have strong secondary stress.<sup>10</sup>

<sup>8</sup> The Lappish data presented here are from the Paatsjoki dialect, cf. T. I. Itkonen (1931, 1958).

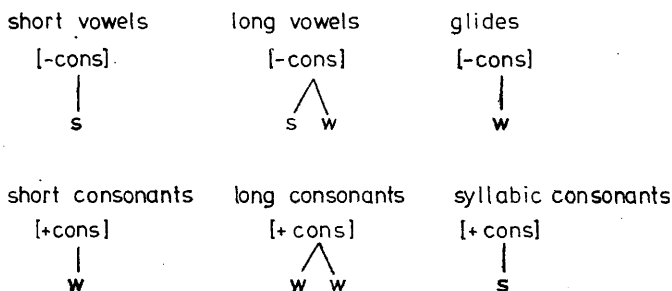
<sup>9</sup> In the derivation of *kõll* a metaphony rule is responsible for the quantitative changes of the vowel in the first syllable.

<sup>10</sup> M. Korhonen et al. (1973, 23-24).

4.2. As indicated above, the third degree in Lappish was brought about historically by phonological processes in the following syllable, termed contraction. According to E. Itkonen's thorough analysis of East Lappish quantitative systems (1946, 190) the contracted vowel in the open syllable is always longer than the corresponding non-contracted vowel. Further, although Itkonen does not make a connection here between quantity and stress, he does conclude that the contracted vowel in the open second syllable is more stressed than a non-contracted vowel in the same position. Closed second syllables at one time used to be longer when they contained a contracted vowel, though the length of the vowels — second syllabic contracted and non-contracted — in the closed second syllable had become equal. Let us now relate these historically justifiable facts to the present assumptions of metrical theory.

4.3. Prince indicates that a distinction must be made between languages that are „prosodically archaic, segmentally innovative”, and others „prosodically innovative, segmentally archaic” in status (1980, 546). Estonian could be classified as being in accordance with the former criteria, whereas Finnish would seem to accord with the latter. The Lappish case seems to bear out — and indeed, as we shall see later, amplifies more concretely — Prince's assumption concerning the status of the two contrasting language types. We shall now discuss in more detail the Lappish segmental innovations in the perspective of prosodic consequences. Further, we shall affirm that it is possible to find evidence of archaic prosodic status in Lappish, thus entitling Lappish also, together with Estonian, to be regarded as a prosodically archaic, segmentally innovative language.

4.3.1. In his paper, W. Leben (1980) emphasizes the problems which may come about by treating length as a purely segmental feature. By pointing out difficulties concerning the analysis of Hausa long consonants, he adduces convincing arguments for treating length as a property of metrical level with quantitative units *s* and *w*. In order to capture the metrical properties of segments of various length, he assumes the following metrical structures of the segments:<sup>11</sup>



In Lappish, because the second syllable is longer in the case of the presence of a contracted vowel, this difference in length could have been manifested in the kind of differences Leben had suggested concerning metrical length. This has significant consequences for the metrical structure of the two-syllabic string.

<sup>11</sup> pp. 502.

The difference, then, between syllables containing a contracted vowel and those with a non-contracted vowel could be reflected in metrical terms as follows:

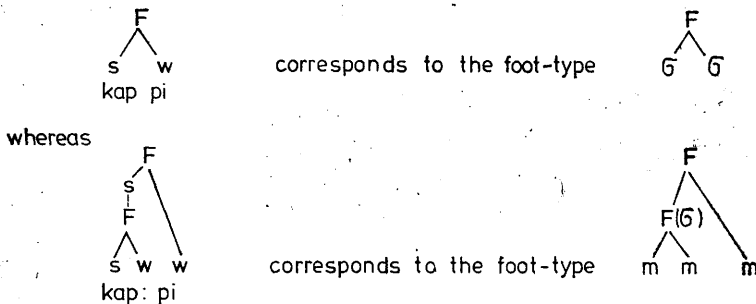


In the above, (a) reflects the metrical structure of a contracted vowel, (b) reflects the metrical structure of a non-contracted vowel. The Lappish word *kõg'tt* /koa'tte/ and *kõg'tta* differ in that the former has a Q2 syllable (preceding the second syllabic vowel, which is subject to the apocope rule), whereas the latter contains a Q3 syllable. This would correspond to Prince's analysis of such Estonian words as *kappi* and *kap: pi*, where the latter contains a Q3 syllable. In Prince's analysis the difference between *kappi* and *kap: pi* corresponds to the following metrical structures:



It is appropriate to recall Prince's BGP rule where he provides justification for a monosyllabic foot. He states that, in Estonian, the special grammatical condition (strong grade) is responsible for the existence of the monosyllabic foot. In Lappish, the formation of the monosyllabic foot is not guaranteed by the presence of the strong grade alone, e.g. *kõg'tt* 'Lappish tent', where the string is the usual disyllabic foot. Another conditioning factor has to be considered in Lappish, and it seems that it is essential to take into account the metrical status of the syllable following the syllable of Q3 length.

The principles Prince applies for showing the differences between *kappi* and *kap: pi* are based upon the following metrical interpretation:



From this it would appear to follow that it is the syllabic status of the second syllable which would ensure that it is stressless, compared with the moraic last syllable of *kap: pi* which is stressed. But this would be incorrect. For it would be counter to the basic assumption of the metrical theory of stress (as in Liber-

man & Prince 1977), according to which distributions of stress are reflections of hierarchical metrical structures. It seems, then, that the above analysis accounts for the first syllabic stress in relation to the metrical structure it is dependent on, but fails to relate the stressed vs. stressless status of the second syllable to the relevant relational structure. Thus Prince does not undertake an analysis of the quantitative properties of the second syllabic vowel. However, he does mention that overlong syllables may be followed by (secondary) stressed syllables, and that this is guaranteed by the foot status of the preceding syllable.

**4.3.2.** There is no reason to doubt that Q3 syllables do have this special metrical status of being a foot. However, the history of overlength in Lappish prompts us to examine the metrical properties of the second syllable — not in terms of its stress properties as being a direct consequence of the preceding syllable, but rather in terms of: (i) considering the special metrical status of the second syllable in relation to the secondary stress placement, and (ii) relating this special metrical status to the very existence of overlength. We may recall E. Itkonen's statements about the length and stress relations of the contracted vowel, both in open and closed syllable (cf. above 4.2.). Bearing in mind the possibility that stress distribution depends directly on a binary branching relational structure, it is possible to assume that historically something like a switch in stress placement must have taken place as a consequence of the phonological process of contraction. This switch in stress placement corresponds perfectly with the different second syllabic metrical structure brought about by the contraction: in metrical terms, the nonbranching structure be-

came a branching  $\begin{array}{c} \text{V} \\ \swarrow \quad \searrow \\ \text{s} \quad \text{w} \end{array}$  structure, giving rise to the occurrence of secondary stress, adjacent to the main stress. We emphasize — and this is the basis of our argument — that the historical facts suggest a definite order of priority: namely, that stress replacement based on changes in the metrical structure brought about the overlong quantity of the first syllable.

**4.3.3.** While examining Estonian quantitative relations in a historical context, V. Tauli's conclusions concerning the development of the first degree of length in Estonian are similar to those advanced for Lappish. After considering the various possible phonetically motivated routes leading to the development of the third degree of length in Estonian,<sup>12</sup> he states that primary responsibility rests with the changed quantitative status of the second syllable. One may safely conclude, then, that monosyllabic foot formation in syllables of Q3 quantity cannot be viewed as being independent of second syllabic quantitative conditions.

**5.** The question naturally arises: through what strategies do learners of Lappish derive the correct string with Q3 in the first syllable and the secondary stress directly following the first syllable? Any answer to this must be based upon an investigation as to whether there is any proof that learners are aware of the special status of the second syllable, both in terms of its metrical struc-

<sup>12</sup> V. Tauli (1954, 10—13).



ture and the consequence of its having secondary stress. The very fact that, following a Q3 syllable, open second syllabic vowels do not undergo the rule of apocope, should definitely be considered proof of the speaker's awareness of the different metrical structure involved in this case. Thus, strings ending with an open second syllable, with branching right nodes, are precisely the ones which, without exception, are resistant to the application of this particular phonological rule. An analysis along the lines of Prince's assumptions might suggest that this could be explained very straightforwardly by one of the systematic properties of Q3 — namely, that their being followed by a syllable of secondary stress would be the reason for their not satisfying the structural description of (1). However, this kind of reasoning would not be sufficient for answering one of the basic questions of Lappish morphophonology: i.e. how speakers derive strings with Q3 syllables. Certainly, we ought to accept the arguments for the psychological reality of the unit foot at an early stage of the phonological derivation (Prince 1980). Nevertheless, we still do not know what it is that guarantees the special foot status for the first syllable, nor what determines its status for being recognized and consequently utilized properly throughout the grammar. The Lappish case definitely suggests the importance of a conditioning factor: namely the priority of second syllabic stress placement over the appearance of the overlong grade. It is thus reasonable to assume that a rule of foot formation must apply, along the lines of the following:

(2)

$$\sigma \rightarrow F / \text{---} \left[ \begin{array}{c} \sigma \\ + \text{ stress} \end{array} \right]$$

Rule (2) suggests that, in Lappish, a first syllable is upgraded to the status of a foot if it is followed by a stressed syllable. Prince's Basic Grade Principle rule should then be slightly modified on the basis of a consideration of the Lappish data which show that, in the strong grade, the strongest syllable is a foot, when it is followed by a stressed syllable.

6. Prince's suggestion that the existence of Q3 invites a following stress (the third systematic property of Q3) may need modification. For the Lappish data require a different interpretation of the relationship between the overlong syllable and the syllable following it, when it comes to explaining the motivation of the occurrence of Q3 syllable and the directionality of the effect of its foot status. Our view is that, as a residue of historical processes, the survival of secondary stress synchronically brings about foot formation in the preceding syllable. If our view is correct, then it may be necessary to reconsider the sixth systematic property of overlength also, as in Prince (1980, 536). For in grade alternation the principal effect of the strong grade does not necessarily ensure foot formation, as the Lappish data show.

6.1. That surface segmental innovations (quantitative levelling in the second syllable) do not effect prosodic status (secondary stress placement, together with its first syllabic foot formation effect), could be taken as proof both of the existence of metrical structures and of the justification of the "segmentally innovative, prosodically archaic" languages assumption.

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