METRICS AND MORPHOPHONEMICS IN THE KALEVALA

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The prosody of Finnish epic folk poetry has been described, with clarity and in detail, in Sadeniemi's Metrik des Kalevala-Verses.[1] This material has important implications for a general theory of prosody which have not yet been drawn. To point out some of these is one of the purposes of the following remarks. Another is to demonstrate that what seem to be systematic classes of exceptions to the general metrical rules established by Sadeniemi actually turn out to be fully regular as soon as justice is done to the phonological structure of the Finnish language. Of the three sections of this paper, the first simply summarizes, and in part slightly reformulates, the essential features of the Kalevala line as stated by Sadeniemi. Section two is a discussion of alliteration, in which a new solution is given to the paradox of vowel (or zero) alliteration. Section three analyzes the specific form of the phonological representations to which the metrical constraints must apply. Towards the end of the paper I indulge in some speculation about the role of sound change and morphophonemics, and their interaction, in the development of metrical systems.

1. The Metrical Structure of the Line

The Kalevala is composed of octosyllabic lines in which the distribution of quantity and stress is subject to certain restrictions. For example, while the following three lines are correctly formed

Luvan antoi suuri Luoja	'The great Creator gave permission'
Selässä meren sinisen	'On the expanse of the blue sea'
Oi Ukko ylijumala	'O Ukko, supreme god'

these two, likewise octosyllabic, violate the metrical rules:

Rakas oli oma emo	'Dear was (my) own mother'
Vanhalla Väinämöisellä	'Old Väinämoinen (adessive)'

To formulate the constraints on quantity and stress it is necessary to assume an underlying trochaic meter for all lines of the Kalevala. The metrical scheme for a line can be represented as $|1 * | 2 * | 3 * | 4 * |$, where the downbeats (ictuses, strong positions) are numbered and the upbeats starred. But the realization of this abstract verse pattern in concrete verse instances[2] is very complex. A recitation of the verses would give prominence to the first syllable of each word, in accordance with the rule of Finnish word stress. Only the first of the three acceptable lines just cited would therefore receive an actual trochaic rhythm in reading, while on the other hand, the first of the two unacceptable lines would also receive a perfect trochaic rhythm. The coincidence of downbeat and stress is therefore neither a necessary nor a sufficient condition for the metrical correctness of a line.

The fundamental rule defining the Kalevala meter in terms of the underlying trochaic pattern is this:

(A) Stressed syllables must be long on the downbeat
     and short on the upbeat.

To this the immediate qualification must be added that the strin-
gency with which the rule applies increases from zero to 100 per
cent as we progress from the first foot to the fourth. In the
first foot the rule is waived completely: the occurrence of
quantity is metrically free. In the second foot the rule ap-
plies, but is frequently broken. In the third it is considerab-
ly tightened, but we still find exceptions. In the fourth foot
the rule is implemented without fail. There is not a single
case in Sadeniemi's sample which violates (A) in the fourth foot.
Such increase of metrical strictness towards the end of the line
is an interesting and almost constant feature of numerous widely
differing metrical systems of the world.

Metrical rules are formulated with design and not instance
in mind: in actual verse we do, for example, get a statistical
preponderance of long syllable in the first downbeat. Two thirds
of the lines begin with a long syllable. But Sadeniemi shows by
statistical argument that this is simply due to the facts that:
(1) the great majority of monosyllabic words are long in Finnish
and (2) a majority of polysyllabic words also begin with a long
syllable.

Non-initial (unstressed) syllables, whether long or short,
can come freely on both the upbeat and the downbeat of any foot.
Monosyllabic words count as normal stressed syllables.

In addition to the fundamental rule (A) which implements the
underlying trochaic pattern through the linguistic features of
stress and length, there exist certain metrical tendencies or
preferences which impart other regularities, of a statistical and
stylistical nature, to the meter of the Kalevala. Two are of es-
pecial interest here because of their wide implications and ef-
fects on the verse.

The first tendency can be stated as follows:

(B) Other things being equal, the words of a line are
     arranged in order of increasing length.

Sadeniemi rightly emphasizes, as others have done, the universal
character of this tendency, and its validity outside of strict
metrics (e.g. rough and ready, one and only but hardly the re-
verse).

It is at one point in the line that the tendency towards
increasing length hardens into a law. As might be expected, this
position of especial strictness is the final foot:

(C) A monosyllabic word is not permitted at the end of
     a line.

Observe that (C) is strongly reinforced by other rules.
Long monosyllables are prohibited in final position anyway be-
cause of rule (A), and certain classes of short monosyllables
(e.g. conjunctions) cannot occur last in the line for purely
syntactic reasons. What justifies the inclusion of (C) at all,
therefore, is the fact that even when these other conditions do
not operate to exclude a final monosyllable, rule (C) holds with-
out exception.

(D) A break often occurs between the 4th and 5th
     syllables.

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There is, in other words, a tendency for a word-boundary to split the line into two quadrisyllabic cola. Sadeniemi adduces this tendency to explain various facts: the otherwise incomprehensible absence of lines containing a four-syllable word flanked by two dissyllables; the regularly long quantity of the 5th syllable in lines containing a dissyllable followed by a word of six syllables; the fact that the first and third downbeats are the preferred sites of alliteration.[3] While the break is not mandatory, lines which neither have a break nor follow rule (B) are rare indeed.

2. The Alliteration Paradox

Most lines (but not all) alliterate in one of two possible ways. The preferred type of alliteration is for words to share the initial consonant (if any) and the first vowel. We shall term this C_0V-alliteration, and distinguish a subtype (a), with a consonant, and a subtype (b), with no consonant.

> C_0V (a) Lappalainen laiha poika
>
> C_0V (b) Astu leski aitastasi

The second type of alliteration, where only the initial consonant (if any) is shared, is three times less frequent. In this type, C_0-alliteration, the analogous two subtypes (a) and (b) can be distinguished.

> C_0 (a) Selässä meren sinisen
>
> C_0 (b) Oi Ukko Ylijumala

Not only in Finnish poetry, but also in the independent traditions of Germanic and Irish poetry, there is an equivalence, in terms of function and frequency, between the subtypes (a) and (b) within both C_0V- and C_0-alliteration. No matter whether the favorite form of alliteration is C_0V, as in Finnish, or C_0, as in Germanic, the subtypes with and without the consonant are treated identically. This equivalence is so ubiquitous that it can hardly be just a prosodic convention, but must be intrinsic to the nature of alliteration itself.

Yet this equivalence seems quite paradoxical. Why should the one-segment alliteration a...a... everywhere correspond not to the one-segment alliteration t...t... but to the two-segment alliteration ta...ta...? And why should a...i... be a case of alliteration at all, just as much as ta...ti... is? What is it that alliterates in a...i...? It cannot be that the vowels alliterate with each other, for alliteration does not disregard any phonological features: t...p... or t...d... are not cases of alliteration.

In Germanic metrics this equivalence of subtypes (a) and (b) is usually explained by assuming that ostensibly vowel-initial words actually began with a glottal stop, and that this glottal stop functioned as the alliterating consonant.[4] All alliteration is thereby reduced to subtype (a). This explanation has been rightly criticized by Jakobson, who pointed out that the assumption of a glottal stop before vowels word-initially is unsupported for the old Germanic languages.[5] The fact that such glottal stops are not found in Finnish makes this explanation out of the question for Finnish and helps to cast further doubt on its validity in Germanic.

Jakobson instead sought the locus of alliteration in the (b) subtypes on the phonemic level. He argued that vowel-initial words actually begin with a zero phoneme /#/, defined as a lax glide corresponding to the tense glide /h/. In this zero phoneme he saw the missing alliterating consonant in the (b) subtypes. I doubt, however, whether it is necessary to set up such a zero phoneme on purely linguistic grounds in any of the Germanic languages or in Finnish. It would have no synchronic function at all, and its distribution would be quite unlike /h/ or any other phoneme.

The search for an alliterating consonant which would get rid of subtype (b) appears to have failed. The resolution to the alliteration paradox must lie elsewhere.

Let us instead rethink the concept of alliteration itself. The paradox vanishes if the nature of alliteration is clearly defined. The source of the paradox is that alliteration is thought of as necessarily involving repetition of actual phonological segments (phonetic or phonemic) in two or more words of a line. Let us instead consider it as identity of portions of words defined by an alliteration schema fixed by poetic convention. Examples of such schemata are:

$$\#C_0V \qquad \text{(Finnish, one type)}$$

$$\#C_0 \qquad \text{(Finnish, the second type)}$$

$$\#C_0(V) \qquad \text{(Finnish, general schema)}$$

$$\# \begin{Bmatrix} [s]\,[+\text{obstr}] \\ C_0^1 \end{Bmatrix} \qquad \text{(Germanic)}$$

These schemata can be framed in the notation developed by Chomsky and Halle for phonological rules.[6] Here C_n^m means "at least n, at most m consonants," and C_0^1 accordingly means "one or zero consonants."[7] The symbol # denotes a word boundary.

We define the analysis of a word by schema P as the biggest piece of it which satisfies P. We can now say that two words in a line alliterate if their analyses are identical.[8]

For example, the words tupa and tapa alliterate by the schema $\#C_0$ because the biggest piece which fits that schema is the identical string #t in both words. Similarly, ukko and akka alliterate by the same schema because the biggest piece which fits it is the identical string # in both words. But tapa and pata do not alliterate because their analyses are the different strings #t and #p, and tapa and akka do not alliterate because their analyses are the different strings #t and #.[9]

Vowel alliteration, or, to use Jakobson's more felicitous term, zero alliteration, is thus simply the special case in which C_0 in the schema is interpreted as "zero consonants." The paradox engendered by the false notion of alliteration as repetition of segments has disappeared. The question "What segments alliterate in ukko and akka?" was unanswerable because it was wrongly put. The correct question is "What schema do they fit?"

3. The Morphophonemic Basis of the Meter and Alliteration

The regularities described in sections one and two above have numerous exceptions if they are regarded as applying to superficial representations of words. Alliteration furnishes a simple example of this. In C_0V-alliteration, according to the

schema proposed above, a geminated vowel can act as the alliterating partner of a simple one:

<p align="center">Kulki kuusissa hakona</p>

The schema also correctly reflects the fact that vowels alliterate with the initial segments of diphthongs, e.g. e with ei, a with ai, and so on. But oddly enough, the long partner of a in C_0V-alliteration is a diphthong whose pronunciation is oa in some dialects of Eastern Finland, ua in others, and which corresponds to standard Finnish aa. These diphthongs do not C_0V-alliterate with o and u, as would be expected since their first segment is o or u. (Of course, the diphthongs oa, ua do C_0-alliterate with o and u, as they do with every other vowel for the reasons discussed in the preceding section. It is C_0V-alliteration which is relevant here.) Similarly, the alliterating partners of e, o, ö are ie, uo, yö:

<p align="center">Somer soitti, hiekka helkki</p>

The explanation for this apparently deviant alliteration pattern is the fact that these diphthongs are morphophonemically geminated vowels. Alliteration, then, is defined on morphophonemic representations, or, at any rate, on representations to which the diphthongization rule has not applied. The alliteration schema is applied while oa (ua) is represented in its underlying form /aa/, and ie, uo, yö are represented in their underlying forms /ee/, /oo/, /öö/. Their alliteration then conforms to the general schema given above. Among the reasons for representing these diphthongs as underlying monophthongs is the fact that if moa, mua is /maa/, tie is /tee/, and so on, then forms such as the plural cases maissa, maita, teissä, teitä can be derived by the same general rule which yields puissa, puita, from puu, or pyissä, pyitä from pyy, and so on in all stems with geminate vowels at the end.

In meter the role of underlying representations is even greater than in the case of alliteration, and much more complex. Consider the following lines from the poetry of Ingermanland:

<p align="center">Vapa vaskinen keäjessä</p>

<p align="center">Otin oinon, toin kottiin</p>

Both of these lines, and hundreds of others like them, are perfectly acceptable and legitimate instances of the Kalevala meter. Yet they appear to violate the rules given in section one. The first line has a long stressed (i.e. word-initial) syllable keäin the upbeat of the third foot, in a position where rule (A) requires that stressed syllables must be short. The second line has a long syllable kot- in the third upbeat, in violation of rule (A); in addition, it is anomalous in containing only seven syllables instead of the required eight.

A consideration of the underlying forms and the rules which relate them to the phonetic shapes will clarify these seeming irregularities. The exact form of the rules does not interest us here, so that a fairly informal notation will do. The order of the rules, however, is essential to the discussion which follows.

(1) Epenthesis $\quad$ [V] $\begin{bmatrix} C \\ -\text{grave} \end{bmatrix}$ [i] #

$$1 \quad / \quad 2 \qquad 3 \qquad 4 \;\rightarrow\; 1\ 3\ 2\ 3\ 4$$

A palatal glide develops before dentals followed by i at the end of a word, e.g. poikani > poikaini. In some dialects it is simply a matter of palatalization in the dental consonant; in the dialect under consideration, however, a real diphthong develops, which is regarded as a long syllable in rule 5, and as a closed syllable in rule 2, as we shall see.

(2) Consonant gradation

Consonants are weakened in open syllables, that is, in the environment ___VC{$^C_\#$, where C denotes either a true consonant or a glide such as the second segment of the diphthongs ai, au, oi etc. Word-initial consonants are not subject to gradation. The results of weakening are complex. I shall simply state verbally what happens. Geminated consonants are degeminated. Thus, the genitive of pappi 'priest' is papin; to the genitive isättömän 'fatherless', there corresponds the nominative isätön. Similarly papittoman (gen. 'priestless') corresponds to papiton (nom.). Note that in the latter form, from underlying pappittom, the degemination applies in two places simultaneously, so that tt is both the environment for the degemination of pp and undergoes degemination itself. Simple consonants have various treatments under gradation. The consonants t and k are generally just dropped, e.g. kätessä > käessä 'in the hand', keskellä > kesellä 'in the middle', poikaini (from poikani by the preceding rule of epenthesis) > pojaini. The consonant p turns to v, e.g. apu (nom. 'help') > avun (gen.). The consonant gradation rules of standard Finnish are in many respects quite different from those of the Ingermanland dialects described here.

(3) Gemination of vowels

$$V\ V$$
$$1\ 2 \rightarrow 1\ 1\ 2$$

Vowels are lengthened, that is, geminated, before vowels. This rule lengthens käessä (from kätessä by consonant gradation) to kääessä. The loss of t and k by consonant gradation is therefore accompanied by what looks like a compensatory lengthening of the preceding vowel in these dialects.[10]

(4) Contraction

$$h \rightarrow \emptyset\ /\ V\_\_\_\_\_V$$

Intervocalic h is lost in suffixes. Thus the form kotihin (illative 'house') becomes kotiin.

(5) Gemination of consonants

$$C \rightarrow 1\ 1\ /\ \left.\begin{matrix}C\\\#\end{matrix}\right\}\ V\_\_\_\_VV$$
$$1$$

Consonants are geminated between a short vowel and a long vowel or diphthong. The form kotiin which arose by the previous rule turns into kottiin. The rule affects not only true consonants, but also glides, so that pojaini (from rule 2) becomes pojjaini, or, as it is conventionally written, poijaini.

(6) Apocopation

$$i \rightarrow \emptyset\ /\ C\_\_\_\_\_\#$$

A final short i drops optionally. For example, poijaini or poijain would both be possible forms.

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(7) Diphthongization

The diphthongization rule has already been described in connection with the discussion of alliteration at the beginning of this section. It raises the first mora of long vowels, e.g. _ee_, _oo_, _öö_ > _ie_, _uo_, _yö_, and _aa_, _ää_ > _oa_, _eä_. The former type of diphthongization, which applies to mid vowels, is found in standard Finnish also, but the latter type, which applies to low vowels, is restricted to eastern Finland.

Examination of the metrics reveals that the operation of rules (3) — (7) is disregarded in the metrics.[11] Returning again to the line

<div align="center">Vapa vaskinen keäjessä</div>

we note that the long stressed syllable _keä_- arises from the operation of rules (3), gemination of vowels, and (7), diphthongization. The derivation is /kätessä/ > (2) _käessä_ > (3) _kääessä_ > (7) _keäessä_, with _keäjessä_ the result of an automatic glide insertion. Up to the operation of rule (3) the word is metrically perfectly correct. In the case of the line

<div align="center">Otin oinon, toin kottiin</div>

the underlying form /kotihin/ is again perfectly compatible with the meter. The violation of syllabicity is only the result of the contraction produced by rule (4), and the long initial syllable _kot_- which violates rule (A) comes about by the operation of consonant gemination (rule 5).

It is important to note that the operation of rules (3) — (7) not only _may_ be disregarded in the metrics; it _must_ be. For example, the secondary geminates produced by rule (3) almost _never_ make the preceding syllable metrically long, whereas underlying geminates almost _always_ do so (Sadeniemi, p. 51).

Rules (3) — (7) are disregarded by the meter, but the same is not true of rules (1) and (2). For example, the operation of consonant gradation is always metrically relevant. The long initial syllable of underlying /keskellä/ 'in the middle' becomes short by consonant gradation (rule 2). Such a syllable is virtually without exception metrically short (Sadeniemi, p. 52) so that a line like

<div align="center">Istuu voan kesellä mertä</div>

is fully regular according to rule (A) of section one.

The conclusion to be drawn from these facts, then, is that the metrical correctness of a line depends on its form at a certain cutoff-point in the derivation, namely the representation obtained after the application of rule (2) but before the application of rule (3). This is not a trivial fact. One could, after all, imagine a situation in which there would be no such cutoff-point, and the metrically disregarded rules would not form a continuous sequence in the ordering.

Some remarkable consequences may be deduced from these facts. Consider forms like _sukkain_ 'my sock(s)', _poijain_ 'my boy(s)', from underlying forms _sukka+ni_, _poika+ni_. Their derivation is as follows:

Underlying form	sukka+ni
(1) Epenthesis	sukkaini

(2) Consonant gradation   sukaini

(5) Consonant gemination   sukkaini

(6) Apocopation   sukkain

In such cases epenthesis happens to have the effect of making the second syllable both closed, so that the consonant gradation applies, and long, so that the degeminated consonant is geminated back again by rule (5). Recalling now that the metrical cutoff-point is between rules (2) and (3), we are led to the prediction that the metrical value of the word should be sukaini, its form after the application of rule (2). That means that the word should be metrically trisyllabic, and, most extraordinarily, that its initial syllable should be metrically short although it is long both morphophonemically and phonetically. This is in fact exactly the situation described by Sadeniemi (p. 52), who gives a list of lines like

> Peälle sulkkuse sukkain
>
> Annan ainuvan poijaini

which confirms this prediction. These lines are metrically correct only if scanned sukaini, pojaini, with the short initial syllable produced by rule (2).

These two lines also illustrate the optional character of apocopation (rule 6). It has applied in sukkain but not in poijaini.

A second unexpected consequence is that there are numerous homonymous words which have different metrical values. According to the rules which have been formulated above, words like /pakko+hon/ '(illative) compulsion' and /pako+hon/ '(illative) flight' merge phonetically to pakkoon. However, they retain distinct forms at the metrical cutoff-point, where the first syllable of one is long and the first syllable of the other is short. In fact, words of the former type almost invariably begin on the downbeat, whereas those of the latter type almost invariably begin on the upbeat, as required by rule (A). Cf. Sadeniemi, p. 51. These, then, are word pairs which are always homonymous but never metrically equivalent.

It would be natural to look for a historical explanation for these facts instead of the morphophonemic one which has been proposed here. Could not one assume that the verses were all composed at a time when none of the sound changes corresponding to rules (3) – (7) had yet taken place, and handed down across the generations until collected in the 19th century? Such a theory would grossly underestimate the creative aspect of a tradition of oral epic poetry. As Sadeniemi points out (pp. 49ff., 104), the singers of the 19th century composed many new poems on known occasions, which were recorded at the time and are found to observe an abstract metrical form just as did the older forms. Since most of the rules in the sequence from (3) to (7) date back at least to medieval times, a coherent defense of this simplest form of the historical explanation is hard to imagine.

But if we grant that the basis of the meter is a synchronic, non-phonetic level of representation, it still makes sense to ask what the role of history may be in the formation of such an abstract metrics. There is no reason at all to deny that the system itself which we have described might have a historical explanation. A thousand years ago the metrically relevant forms may

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well have been phonetic. We can then assume that after the sound
changes corresponding to rules (3) — (7) took place, the existing
body of poetry was reinterpreted by successive generations of
singers as metrically based on abstract, non-phonetic forms of a
fixed kind, namely those reached at our cutoff-point, and new po-
etry of the same kind continued to be created. The superficial
violations of the trochaic pattern and rule (A) which the sound
changes produced were not viewed as mistakes but as the norm to
be learned and imitated by the apprentice singer. The singers
were able to learn and continue this norm in a creative way be-
cause they knew (unconsciously, of course) the morphophonemic
structure of Finnish, and the sound changes continued to operate
as living morphophonemic processes in the synchronic sound pat-
tern of the language. They could therefore learn (again, uncon-
sciously) to disregard these morphophonemic processes in order to
continue as closely as possible the traditional body of poetry
which they had learned by listening to older singers.

But this is only possible if the sound changes stay in the
grammar as productive morphophonemic processes, as rules (3) —
(7) unquestionably did. If the sound changes result in restruc-
turing of the lexicon,[12] leaving no synchronic trace behind of
their former existence, a different situation results. This sit-
uation is one in which the poets are unable to understand the
metrical form of much of the traditional poetry, because it is
composed in a language which they cannot reach simply by peeling
away some of the morphophonemic rules of their unconscious gram-
mar. Illustrations of this other type of situation are numerous.
For example, the final -e's which English lost after Chaucer
wrote in the fourteenth century were by and large lost not only
phonetically, but also from underlying forms, since the synchron-
ic alternations of the language did not provide any reason for
retaining them. As a result, Chaucer's poetry was regarded as
metrically irregular for many centuries, though written in the
perfectly familiar iambic pentameter. One cannot read him now
without the kind of philological information that became availa-
ble only in the last two hundred years. Or, to cite another
case, so-called diectasis (or "distension") in Homer is essen-
tially the attempt of later singers to make sense out of vowel
contraction in morphophonemically opaque forms, where the right
uncontracted form had been irrevocably lost because no morpho-
phonemic alternations gave any clue about its original shape.

Even if the sound changes which bring about the metrical
violations are retained as productive morphophonemic rules in the
language, and the underlying forms of the earlier period are re-
tained unchanged, one should still expect some disruption of met-
rical intelligibility if the synchronic order of the rules is
significantly different from the relative chronology in which the
corresponding sound changes applied. For if such reordering has
taken place, a situation could easily arise in which the former
system of phonological rules, necessary for scanning the older
poetry, cannot be derived from the new system simply by omitting
a block of rules from the end. The morphophonemic rules corre-
sponding to the most recent sound changes would form a discontin-
uous sequence, and some of them would precede morphophonemic
rules corresponding to historically older sound changes, which
could not be disregarded in scanning.[13] Of the seven Finnish
rules discussed here, only one is ordered in historically the
"wrong" place. The epenthesis rule (rule 1), a fairly recent

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change of some eastern dialects, is synchronically ordered before
consonant gradation, a much older rule of at least Balto-Finnic
date. The gradation of poikaini (from underlying /poika+ni/ to
pojaini (ultimately poijain[i]) is therefore analogical, since
the closed syllable which causes gradation in this word is of
much later origin than the gradation rule itself. The epenthesis
rule has shifted into its present early position in the sequence
of rules by a secondary reordering.[14] Presumably, then, poems
composed before this reordering would have presented certain met-
rical anomalies after it, since the operation of consonant grada-
tion would have been metrically relevant except in the cases like
poijaini where it had originated only by the recent analogical
extension resulting from the reordering of the epenthesis rule.
If this situation ever existed, the attested poetry seems to have
no trace of it. The new instances of gradation have come to be
treated exactly like the old ones, so that poijaini, for example,
has a short initial syllable as its metrical value.

I would suggest, then, that phonological restructuring sets
certain limits on the direct continuity of a poetic tradition.
Restructuring is irrevocable change, and to the extent that re-
structuring has taken place with respect to metrically signifi-
cant features of the language, the metrical structure of poems
composed in the older language will be understood as "faulty" in
terms of the new linguistic system. Extreme cases may even be
imagined in which the phonological changes are so far-reaching
and disruptive that the older poems not only seem faulty but met-
rically unintelligible. This might suggest implications for the
study of change in metrical systems.

But we must also ask about the synchronic significance of
such metrical systems. What conclusions, from the viewpoint of
synchronic phonology and of poetics, may be drawn from the met-
rics of the Ingermanland epics?

That the metrical value of a line should be determined by
its representation at a certain point in the synchronic deriva-
tion lends support for the theory of phonology proposed by Chom-
sky and Halle. The cutoff-point which we found between rules
(2) and (3) would of course not exist in a phonology based on
unordered realization rules. The metrical system of the Kalevala
could not be described in its full generality on the basis of
such a phonology. But by the same token, the existence of such
a metrical cutoff-point poses an interesting problem which gen-
erative phonology at present is not in a position to solve. Gen-
erative phonology has disclaimed the existence of any linguisti-
cally significant representation intervening between the morpho-
phonemic and phonetic levels. Yet here there is an intervening
level which plays a systematic role in the metrics. To be sure,
it is not the autonomous phonemic level posited by structuralism,
but a good deal more abstract than that. Still, it would be of
interest to see whether the metrical cutoff-point can be charac-
terized in any general terms, and whether the representations
reached at that point in Finnish, or the equivalent level defined
in the same general terms in other languages, has any systematic
status in phonology at all. Even if this should turn out not to
be the case, the fact that an intervening level of representa-
tions is even accessible, as its function in metrics shows, is
psychologically of some importance.

The conclusions reached in this paper demonstrate the ab-
stractness of metrical structure in two different respects.

First, they show how necessary it is to draw, with Jakobson, the distinction between the underlying design of verse and its actual instantiation. The extreme complications which would result from attempting to describe the possible lines of the Kalevala without assuming an underlying trochaic pattern, reflected only indirectly in the actual realization, are obvious when the facts discussed in section one are kept in mind. Secondly, they show the abstractness of the linguistic representations which metrical rules can operate to constrain. Neither meter nor alliteration can be understood unless the morphophonemic structure of the language is understood.[15]

Notes

1. M. Sadeniemi, Die Metrik des Kalevala-Verses, Folklore Fellows Communications No. 139, Helsinki, 1951.

2. R. Jakobson, "Linguistics and Poetics," in T. A. Sebeok, (ed.) Style in Language, Cambridge, Mass.: M.I.T. Press, 1960; M. Halle and S. J. Keyser, "Chaucer and the Study of English Prosody," College English 28.187-219 (1966); M. Halle, "Linguistic Aspects of Poetic Meter," Proceedings of the Xth International Congress of Linguists (forthcoming).

3. Alliteration is confined to word-initial syllables, which, however, need not necessarily be strongly stressed. Sadeniemi has observed several preferential tendencies concerning the locus of alliteration apart from the preference for the beginnings of the cola. Favorite carriers are: (1) adjacent words (2) relatively long words (3) downbeats in general.

4. See e.g. E. Sievers, Altgermanische Metrik, Halle 1893; A. Heusler, Deutsche Versgeschichte I, Berlin-Leipzig 1925.

5. R. Jakobson, "On the So-called Vowel Alliteration in Germanic Verse," Zeitschrift für Phonetik, Sprachwissenschaft, und Kommunikationsforschung 16.85-92 (1963).

6. N. Chomsky and M. Halle, The Sound Pattern of English, New York, 1968. It is not self-evident that this should be the case. One could easily imagine prosodic schemata which could not be stated in the notation which is needed for phonological rules. The comparison between Germanic alliteration and Gothic reduplication strikingly illustrates the detailed analogies which may be found between phonology and prosody.

7. Because Finnish has no initial consonant clusters, I write simply C_0 "any number of consonants" instead of C_0^1 in the schema for Finnish, though the actual number of consonants covered by C_0 is always either one or zero in this language.

8. Actually, identity of analyses by some schema is a generalized definition of the concept of assonance conceived in its broadest sense. The distinction between alliteration and rhyme is given by the formal properties of the schemata. All schemata which begin with the word boundary # are

schemata for alliteration: all schemata which end with #
are schemata for rhyme, and so on.

9. It will be seen that the Germanic alliteration schema cor-
rectly reflects the fact that st, sp, and sk alliterate on-
ly with themselves, whereas other consonant clusters begin-
ning with s, such as sn, sl, alliterate with any word be-
ginning with s other than the three clusters mentioned.

10. The traditional assumption that compensatory lengthening is
involved is cogently criticized by M. Rapola, Suomen kielen
äännehistorian luennot, Helsinki, 1966, pp. 386-389.
Rapola notes that it is restricted to certain vowel combina-
tions.

11. For other, less complex examples of the interaction of mor-
phophonemics and metrics, see p. 90 of Jakobson's article
cited in note 5, and V. Zeps, "The Meter of the So-called
Trochaic Latvian Folksongs," International Journal of Slavic
Linguistics and Poetics 7.123-128 (1963).

12. On the concept of restructuring, see e.g. R. Jakobson,
"Principles de phonologie historique," Selected Writings,
Vol. I (The Hague, 1962); M. Halle, "Phonology in Generative
Grammar," in Fodor and Katz (eds.) The Structure of Language
(New York, 1964); and the article by G. Lakoff in this vol-
ume.

13. On reordering of rules as a form of analogical change, see
P. Kiparsky, "Linguistic Universals and Linguistic Change,"
in Bach and Harms (eds.) Universals in Linguistic Theory
(forthcoming).

14. I have proposed in the cited article that reordering pro-
ceeds in the direction which maximizes the application of
rules. The present case supports this hypothesis, since
the rules end up in what is there termed feeding order.
That is, the epenthesis rule, in its new place, adds new
instances which meet the structural analysis of the conso-
nant gradation rule.

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