

FINNISH VOWEL HARMONY: RULES AND CONDITIONS

ROYAL SKOUSEN

In Finnish there are neutral vowels and harmonizing vowels. The harmonizing vowels can be divided into two distinct sets of vowels, the front harmonizing vowels *y*, *ö*, and *ä*, and the back harmonizing vowels *u*, *o*, and *a*. There is a general vowel harmony condition that restricts the distribution of the harmonizing vowels: Within a given morpheme no front harmonizing vowel can occur with a back harmonizing vowel. We find morphemes such as *tuhma* 'naughty' and *tyhmä* 'stupid', but no native words of the form *CaCä*, *CyCo*, *CöCu*, and so on.

All back vowels are harmonizing vowels, but not all front vowels are front harmonizing vowels. The two front vowels *i* and *e* have been referred to as neutral vowels since their distribution with respect to the harmonizing vowels appears to be unrestricted; *i* and *e* occur freely with back and front harmonizing vowels. A neutral vowel occurs with a back vowel in *iso* 'big' and *verho* 'curtain'; while in words like *isä* 'father' and *kesy* 'tame', a neutral vowel occurs with a front harmonizing vowel. Of course, neutral vowels freely occur with each other, as in *piene* 'small' and *kiltti* 'nice'. There are some loan words that violate the vowel harmony condition. For example, *analyttikko* 'analyst', *pyromaani* 'pyromaniac', and *afääri* 'affair'. In each of these examples at least one back vowel occurs with a front harmonizing vowel. These words are cultural loans and are infrequently used.

In conjunction with the vowel harmony condition, there is evidence for a vowel harmony rule in Finnish that operates whenever there exists a sequence of morphemes that violate the vowel harmony condition. For example, consider the inflectional suffix for the elative case, which in surface representation appears as either *sta* or *stä*, depending upon the particular nominal stem to which it is suffixed. If the stem contains at least one back vowel, the suffixal vowel is also back. For example, the elative of *tuhma* is *tuhmasta*. If the stem contains at least one front harmonizing vowel, the suffixal vowel is also a front harmonizing vowel. For example, the elative of *kesy* is *kesystä*. Finally, if the stem contains only neutral vowels – that is, if there are no harmonizing vowels in the stem – then the elative suffix invariably shows up with a front harmonizing vowel. For example, from *piene* we have *pienestä* and from *kiltti*, *kiltistä*. In other words, the only time the back vowel *a* shows up in the elative suffix is

if the preceding stem contains a back vowel. Otherwise, the elative suffix will be realized as *stä*. For loan words violating the vowel harmony condition, the suffixal vowel will agree with the last non-neutral vowel in the stem. Thus we get the following elative forms: *analyytikosta, pyromaaniasta, afääristä*.

There have been numerous attempts to account for these vowel harmony relations. One possible way would be to postulate a rule of vowel harmony that would operate not only across morpheme boundaries, but also within the morpheme itself. For example, one could mark the first vowel of a stem as either a back or a front harmonizing vowel. Then any following harmonizing vowel would be made to agree in backness with that first vowel. There could be at least two alternative ways of viewing such a solution: Underlyingly, all the following harmonizing vowels could be archi-phonemes (*A, O, U*) unmarked for backness and the vowel harmony rule would supply the feature for backness; or all the following vowels would be fully specified and the vowel harmony rule would only change those harmonizing vowels disagreeing in backness with the first vowel.

Zimmer (1967) proposed that the first of these two alternatives might be used to account for vowel harmony in classical Mongolian. Kiparsky (1968) showed that if such a solution was used to explain Finnish vowel harmony, there would be a violation of his alternation condition. In order to determine the backness of the final stem vowel in *velka* 'debt' and *selkä* 'back', one would have to postulate that the neutral vowel *e* in *velka* was underlyingly some back harmonizing vowel – say *a* – and then after the vowel harmony rule had operated, unconditionally merge *a* with the front harmonizing vowel *e*. Kiparsky argued that there is no evidence in Finnish – either historically or synchronically – that the neutral vowels come from harmonizing vowels. Zimmer's method would fail anytime the first vowel of a word was a neutral vowel.

Kiparsky restricted the vowel harmony rule so that it only applies between morphemes. He postulated that the vowels of the root are not archi-phonemes, but are fully marked. Then he claimed that there is a morpheme structure condition independent of the vowel harmony rule that accounts for the fact that except for certain loan words back vowels do not occur with front harmonizing vowels in roots. The vowels, of the suffixes, however, are archi-phonemes, unspecified for backness, and the backness of these vowels is supplied by the vowel harmony rule. If the last non-neutral vowel of the root is back, then the suffixal archi-phoneme is realized as a back vowel. Otherwise, the suffixal vowel is fronted by the vowel harmony rule. So if the last non-neutral vowel of the root is a front harmonizing vowel, then the archi-phoneme in the suffix will be specified as a front vowel. If all the vowels of the root are neutral vowels, then the archi-phoneme also shows up as a front vowel because the neutral vowels are also front vowels. In some sense, then, the neutral vowels of the stem behave as harmonizing vowels with respect to the vowel harmony rule – but only if there are no harmonizing vowels in the stem.

Kiparsky's formulation claims then that if the stem contains only neutral vowels,

the suffixal vowels will show up as front vowels. Rardin (1969) has pointed out that there are some derivational suffixes that show up with back vowels when suffixed to roots containing only neutral vowels. For example, consider the derivational suffix *uute* ~ *yte* that is used in nominalization. If the root contains at least one back vowel, the suffixal form also contains back vowels:

aava 'open'	aavuute 'openness'
vinha 'swift'	vinhuute 'swiftness'
piru 'devil'	piruute 'deviltry'

If the root contains at least one front harmonizing vowel, then the suffix is *yyte*:

kesy 'tame'	kesyyte 'tameness'
selvä 'clear'	selvyyte 'clearness'
isä 'father'	isyyte 'fatherhood'
pyhä 'holy'	pyhyyte 'holiness'

If the root contains only neutral vowels, then the suffix takes the back vowels, not the front harmonizing vowels:

piene 'little'	pienuute 'smallness'
miehe ¹ 'man'	miehuute 'manliness'
pite 'long'	pituute 'length'

In this case, the only time the front harmonizing vowels show up is if the preceding stem contains at least one front harmonizing vowel. Otherwise, the suffixal form is *uute*.

Rardin postulated that the distribution of the elative suffix could be accounted for by postulating that the elative suffix is underlyingly *stā* rather than *stA*, as Kiparsky formulated, and that the underlying front harmonizing vowel *ā* shows up whenever the stem contains only neutral vowels. The form *sta* can only show up in case the stem contains a back vowel. Rardin also postulated that the underlying form of the nominalizing suffix would have back vowels: *uute*.² Again, if the root contains only neutral vowels, then the underlying back vowel *u* will show up. The front harmonizing vowel *y* will only show up if the preceding root contains a front harmonizing vowel. Rardin therefore argued that the suffixal vowels as well as the root vowels are fully specified. By Rardin's formulation the neutral vowels are in all respects neutral. They never behave as if they are front harmonizing vowels.

Following Rardin, I will postulate that the vowel harmony rule eliminates violations of the vowel harmony condition between sequences of morphemes and that all morphemes, both roots and suffixes, contain fully-specified vowels. The vowel harmony rule will change the vowels of a suffix to agree in backness with the last non-neutral vowel of the stem if the harmonizing vowels of the suffix belong to a different

¹ The form *miehe* is actually a derived stem; the underlying root is *miese*.

² The underlying representation of *uute* is actually *uukte* since the plural form of this suffix shows up as *uuksi*, after the rule $t \rightarrow s/_{-i_p}$ has applied. In the singular, the *k* preceding the *t* is deleted.

class of harmonizing vowels than the last non-neutral vowel of the stem. For example, consider the derivation of *isyydestä* 'about fatherhood'. Underlyingly, we have *isä+uute+stä*. Since the *u* of the suffix *uute* and the *ä* in the root *isä* violate the vowel harmony condition, the *u* will be changed to its corresponding front harmonizing vowel *y*: *isä+yute+stä*. Then the *ä* of the root will be deleted, giving us *isyyte+stä*. Now the vowel harmony rule will not apply to the suffix *stä* since there is no violation of the vowel harmony condition. Thus we get the final form *isyydestä*.³ Note that the violation of the vowel harmony condition could be avoided by deleting the stem-final *ä* before the vowel harmony rule applies. But this would give the incorrect form **isuudesta*. The point is that the stem-final vowel is only deleted after the vowel harmony rule has applied.

The underlying form of a suffix will, in general, appear if the preceding stem contains only neutral vowels. Interestingly, all so-called inflectional suffixes take underlying front harmonizing vowels. An example of a noun inflectional suffix was the elative case marker *stä*. Take a verb inflectional suffix such as the present participle ending *vä*. This suffix shows up with a back vowel only if the preceding verbal stem contains at least one back vowel:

seiso 'to stand'	seisova 'standing'
lähte 'to leave'	lähtevä 'leaving'
itke 'to cry'	itkevä 'crying'

Otherwise, the underlying form *vä* remains unchanged. This distribution holds for all the inflectional suffixes. Let us therefore postulate the following underlying forms for the inflectional suffixes:

noun inflectional:	essive	nä
	partitive	tä
	inessive	ssä
	elative	stä
	adessive	llä
	ablative	ltä
	abessive	ttä
verb inflectional:	third person plural	vät
	present participle	vä
	first infinitive	täh
	first infinitive long form	täksen
	past participle	nyt
	passive past participle	ty
	passive present	tä
	third person imperative	kö
first, second person imperative	kä	

³ In a closed syllable *t* gradates to *d*.

Derivational suffixes can either take underlying front harmonizing vowels or back harmonizing vowels, although the majority of these suffixes take the front harmonizing vowels. A list of the front harmonizing derivational suffixes would include the following suffixes:

verbalizing	tä
moderate	hkö
collective	stö
agent	jä
locative	lä
nominalizing	mä
noise, vibration	inä
lack of	ttömä
comparative	mpä
feminine	ttäre
verbalizing	öi
place of work	mö

Consider, for example, the verbalizing suffix *öi*. If the stem contains at least one back vowel, the verbalizing suffix is realized as *oi*:

nimikko 'namesake'	nimikoi 'to initialize'
penikka 'puppy'	penikoi 'to whelp'
unelma 'dream'	unelmoi 'to daydream'

Like the derivational suffix *uute*, the vowel harmony rule applies before the deletion of the stem-final vowel. Otherwise, we would get, for example, **peniköi* rather than *penikoi*. Of course, if the stem contains a front harmonizing vowel, then the derivational suffix remains *öi*:

lipeä 'lye'	lipeöi 'to treat with lye'
kyynele 'tear'	kyynelöi 'to weep'
hedelmä 'fruit'	hedelmöi 'to bear fruit'

Except for some recent loans from Swedish,⁴ *öi* shows up if the stem contains only neutral vowels:

⁴ Nearly all of these cultural loans have been directly manufactured from Swedish verbs ending in *era*:

absorbera	~ absorboi	'to absorb'
abstrahera	~ abstrahoi	'to abstract'
desinficiera	~ desinfioi	'to disinfect'
identifiiera	~ identifioi	'to identify'
legitimera	~ legitimoï	'to legitimize'
polarisera	~ polarisoi	'to polarize'
replikera	~ replikoi	'to say one's lines'

The Swedish verbal ending is always replaced by *oi* instead of *öi*. The vowel harmony rule is not allowed to apply even if the vowel harmony condition is violated:

entise 'former'	entisöi 'to restore'
sinetti 'seal'	sinetöi 'to seal (up)'
meteli 'uproar'	metelöi 'to riot'
nikkeli 'nickel'	nikkelöi 'to plate with nickel'
liikentehe 'traffic'	likennöi 'to (carry on) traffic'
titteli 'title'	tittelöi 'to call someone by his title'
sepelä 'rubble'	sepelöi 'to cover with rubble'
seppelhe 'wreath'	seppelöi 'to wreath'
mirkeli 'emery'	mirkelöi 'to polish with emery'
rekisteri 'register'	rekisteröi 'to register'
liisteri 'paste'	liisteröi 'to paste'
messinki 'brass'	messingöi 'to brass'
pensseli 'paintbrush'	pensselöi 'to paint with a brush'

Some of the derivational suffixes that have underlying back vowels are as follows:

diminutive; names of plants and animals	kka
collective ⁵	(i)kko
object ⁶	ikko
individual ⁷	kko

debutera [debote:ra] ~ debytoi	'to make a debut'
pastörisera ~ pastöroi	'to pasteurize'

Similarly, the remaining few examples that do not have the underlying *öi* suffix have been constructed from nouns that have been recently borrowed from Swedish:

klisché ~ klišee	'stereotype plate'	klišeoi 'to stereotype'
kriti:k ~ kritiikki	'criticism'	kritikoi 'to criticize'
polemi:k ~ polemiikki	'polemics'	polemikoi 'to dispute'
politi:k ~ politiikka	'politics'	politikoi 'to play politics'

Incidentally, the last three verbs have alternate forms which have been constructed directly from the Swedish verb:

kritisera ~ kritisoi
polemiserä ~ polemiso
politiserä ~ politiso

⁵ Whenever *kko* is used in the collective sense, there is usually an alternate form with the front harmonizing vowel *ö* if the plural marker *i* is also present:

lehvä 'leaf'	lehvikkö ~ lehvikko 'foliage'
lehte 'leaf'	lehdkkō ~ lehdkko 'grove'

⁶ In referring to non-living objects, *ikko* is nearly always the underlying form:

risti 'cross'	ristikko 'grating'
seinä 'wall'	seinikko 'room near the outer wall'
kehä 'circle'	kehikko 'frame'
lieme 'broth'	liemikko 'tureen'
pii 'tooth of a comb or rake'	piikko 'homespun tow'

With this suffix the stem-final vowel appears to be deleted before the vowel harmony rule applies.

⁷ In referring to living objects, the underlying form is *kko*:

esi 'first'	esikko 'primrose'
vesi 'water' (nominative case)	vesikko 'mink'

collective	ueh ⁸
nominalizing	uu
	o(kse)
	u(kse)
	uute

As another example of a derivational suffix with underlying back vowels, consider the nominalizing suffix *o*. Nominals ending in *o* or *ō* are created from two-syllable verb stems ending in *e* or a low vowel:

näke 'to see'	näkō 'vision'
säästä 'to save'	säästö 'savings'
tunte 'to feel'	tunto 'sensation'
jatka 'to continue'	jatko 'continuation'
teke 'to do'	teko 'deed'
elä 'to live'	elo 'life'

The nominalized form ends in *ō* only if there is a non-final, front harmonizing vowel in the stem. In all other cases, *o* shows up. With this derivational suffix, the stem-final vowel is deleted before the vowel harmony rule applies:

elä + o → el + o → elo.

Otherwise, we would derive the incorrect from *elō.

Kiparsky (personal communication) has noted that these derivational suffixes having underlying back vowels actually behave as if they have underlying front harmonizing vowels whenever they are attached to stems of three or more syllables. For example, from the stem *miehe* 'man' we get *miehuute*, but in the compound *esimiehe* 'chairman' we get *esimiehyyte* 'chairmanship', not **esimiehuute*. The same phenomenon occurs with the nominalizing suffix *u*. From the two-syllable verb stem *itke* 'to cry' containing only neutral vowels we get *itku* 'crying'. Consider, however, the verb stem *teeskentele* 'to fake'; the nominalized form here is *teeskentely* 'faking', not **teeskentelu*. It is possible to derive this verb stem from the root *teke* 'to do'. If so, one might claim that if the derivational suffix (such as *uute* or *u*) is added to a basic stem such as *itke* or *miehe* – in distinction to a derived stem or a compound

erä- (as in <i>erämaa</i> 'wilderness')	erakko 'hermit'
kesä 'summer'	kesakko 'freckle'
venä- (as in <i>venäläinen</i> 'Russian')	venakko 'Russian woman'

As Kiparsky (personal communication) points out, such examples as *venakko* and *erakko* show that the back vowel of the suffix *kko* remains even if the underlying stem ends in a front harmonizing vowel. Perhaps there is some regressive vowel harmony taking place in these words since *kko* doesn't change to *kkō*. Note that in each case where *ä* → *a*/- + *kko* takes place, the first vowel of the root is a neutral vowel.

⁸ With this suffix some speakers delete the stem-final vowel before allowing the vowel harmony rule to apply. Such speakers would derive *pesueh* 'litter' from *pesä* 'nest'. Other speakers get the form *pesyeh*. For these speakers, vowel harmony applies before the stem-final vowel is deleted.

stem – then the underlying vowels are back vowels; while if the stem is in some sense derived (such as *esimiehe* or *teeskentele*), then the derivational suffix would take front harmonizing vowels. This solution would explain why the nominalizing suffix *yyte* is added to a derived stem ending in *ise* rather than *uute*:

leikki + ise + yyte → leikkisyyte⁹

Another way to account for this variation in these nominalizing suffixes is to say that the back vowel form of the suffix only occurs in the second syllable, while in the third and following syllables the front harmonizing vowels would be found. This explanation could be used to explain why the verbalizing suffix *öi* has an underlying front harmonizing vowel; the suffix always forms a verb stem that is at least three syllables long. Consider in addition the derivation of *terveyte* 'health' from the root *tervehe* 'healthy':

tervehe + yyte → tervehyyte → terveyyte → terveyte¹⁰

If the underlying stem ended in *uute*, we would get the incorrect form **terveute*. In forming two-syllable stems both these nominalizing suffixes behave as if they have underlying back vowels. In stems of more than two syllables, these suffixes act as if they have underlying front harmonizing vowels. Perhaps this generalization can be extended to all derivational suffixes beginning with a vowel: *öi* appears to take a front harmonizing vowel since it forms only three-syllable verb stems; the nominalizing suffix *o* appears to have a back vowel since it is suffixed to two-syllable verb stems. But derivational suffixes like *kko* and *ttömä* will take their underlying harmonizing vowels irrespective of the syllable in which they appear. We have *kko* in both two and three syllable words:

pii 'tooth of a comb or rake'	piikko 'homespun tow'
seinä 'wall'	seinikko 'room near the outer wall'

Similarly, we have *ttömä* irrespective of the number of syllables:

tie 'road'	tiettömä 'without roads'
miehe 'man'	miehattömä 'without a man'
pistime 'stinger'	pistimettömä 'stingless'

In any event there will be some derivational suffixes taking underlying back vowels irrespective of the syllable. The vowel harmony rule remains unchanged. We must specify that certain vowel-initial derivational suffixes have underlying back vowels in forming two-syllable stems, but have underlying front harmonizing vowels in words of more than two syllables. Having specified the variation in the underlying represen-

⁹ It is possible to derive *leikkisyyte* 'playfulness' from *leikkisä* 'jesting' rather than *leikkise* 'jesting'. If this is the case, then *uute* could be the underlying representation.

¹⁰ The second of a sequence of three vowels is deleted.

tations for such suffixes, the more general rule of vowel harmony will apply to eliminate violations of the vowel harmony condition between morphemes.

Kiparsky's vowel harmony condition restricts the distribution of harmonizing vowels in native morphemes. His vowel harmony rule is independent of his vowel harmony condition. In support of his vowel harmony condition, Kiparsky claimed that 'the two vowels *i* and *e* co-occur freely with vowels from both harmonic sets (*ü ö ä* and *u o a*) in morphemes'.¹¹ Actually, this is not the case. There are certain restrictions on the occurrence of the harmonizing vowels with the neutral vowels. In fact, these restrictions are exactly like the distribution of the harmonizing vowels in the suffixes.

Consider first of all the distribution of the round mid-vowel and the neutral vowels *i* and *e*. If the neutral vowels truly occur freely with *o* and *ö*, then we should have morphemes of the form *CiCo*, *CeCo*, *CiCö*, and *CeCö*. However, in the native vocabulary we never find the last two forms. There are no two-syllable morphemes ending in *ö* preceded by neutral vowels. The only time *ö* can occur as the second vowel of the native morpheme is if the first vowel is a front harmonizing vowel. For example, we have words like *pyrstö* 'tail', *pöhö* 'swelling', and *sälö* 'flake'. Of course, if the first vowel is a back vowel, the round mid-vowel is back, as in *koko* 'entire', *laho* 'decayed', and *kuuro* 'deaf'. But if the first vowel is neutral, the round mid-vowel is *o*: *eho* 'dainty', *ehto* 'condition', *eno* 'maternal uncle', *ero* 'parting', *helppo* 'easy', *hio* 'to grind', *inho* 'detestation', *kieto* 'to wind', *melto* 'soft', *pelko* 'fear', *penko* 'to root up', *perho* 'butterfly', *silo* 'smooth', *silpo* 'to mutilate', *tempo* 'to jerk', *tienoo* 'region', *velho* 'magician', *vino* 'slanting', *viro* 'Estonian', and so on. There are only two exceptions to this generalization: *miljö* 'milieu' and *likööri* 'liqueur'. Both these words are obvious borrowings. This distribution of *o* and *ö* exactly mirrors the distribution of the round mid-vowel in the nominalizing suffix *o*. In both cases, the *ö* only shows up if the first vowel is a front harmonizing vowel.

Another example of a restriction on the distribution of neutral and harmonizing vowels occurs with verb stems at least two syllables long ending in a low vowel. If the verb has a front harmonizing vowel in the first syllable, then the stem-final low vowel is, of course, *ä*: *jättä* 'to leave', *löytä* 'to find', *kylvä* 'to sow'. If the first vowel of the stem is a back vowel, then the stem-final low vowel is *a*: *purka* 'to loosen', *autta* 'to help', *huolta* 'to take care of', *nouta* 'to bring'. If the first vowel of the verb stem is neutral, the stem-final vowel is always *ä*: *hirttä* 'to hang', *pitä* 'to like', *elä* 'to live', *entä* 'to hurry', *mieltä* 'to conceive', *estä* 'to hinder', *itä* 'to geminate', *intä* 'to insistently assert', *kestä* 'to last', *liitä* 'to glide', *liittä* 'to join', *peittä* 'to cover', *pettä* 'to deceive', *siittä* 'to breed', *vetä* 'to pull', *tietä* 'to know', and so forth. There are no exceptions to this generalization.

One could try to derive some of these verb stems by means of the verbalizing suffix *tä*. For example, verbs like *erota* 'to separate' and *haluta* 'to want' can be

¹¹ Kiparsky (1968), p. 30.

derived from the roots *ero* 'parting' and *halu* 'desire'. By making use of a rule of *e*-deletion, one could derive, for example, *mieltä* 'to conceive' from *miele* 'mind' and *huolta* 'to take care of' from *huole* 'care'. One could try to derive some of the remaining verbs by means of *tä* and some ad-hoc rules on the basis of some kind of semantic similarity:

jää 'to remain'	jättä 'to leave'
apu 'help'	autta 'to help'

But there is no guarantee that we can find a semantically-related stem which could be used to derive the verb. We would really have to stretch our imagination to get *hirttä* 'to hang' from *hirte* 'log' and *tietä* 'to know' from *tie* 'road', even though these verbs are probably historically derived from such roots.¹² And even allowing this questionable usage of semantics, we could not explain away all of these verbs ending in a low vowel. We will be finally left with a fairly large class of non-derivable verb stems that end in a low vowel. For such verbs the back vowel *a* will appear only in case the first vowel is a back vowel.

To handle these generalizations I will postulate two conditions on the distribution of underlying vowels in native words.¹³

- (1) $\left\{ \begin{array}{l} \text{\textit{o}} \text{ doesn't occur as the second vowel in a root;} \\ \text{verb stems of two or more syllables do not end in } a. \end{array} \right.$
- (2)

The underlying representation of *pyrstö* 'tail' and *alka* 'to begin', for example, would be *pyrsto* and *alkä*. In this solution the vowel harmony condition is violated in the underlying representation. In order to eliminate such violations of vowel harmony, the vowel harmony rule will always apply to such underlying forms, giving the stems *pyrstö* and *alka*. With such a formulation, there is no need for a vowel harmony condition independent of the vowel harmony rule. Rather, the vowel harmony rule applies within morphemes and across morpheme boundaries whenever the vowel harmony condition is violated. The vowel harmony condition is violated not only for certain recent loan words, but also for many native morphemes. Such loan words will be marked so that the vowel harmony rule will not apply to the morpheme itself, but any suffixes added to such morphemes will undergo the rule. The vowel harmony rule would not apply to *analyttikko* since it would be marked as minus the vowel harmony rule. But the rule would apply to the elative suffix even if the suffix is added to a loan word that violates the vowel harmony condition: *analyttikosta*, not **analyttikostä*. For native roots the vowel harmony rule will

¹² Hakulinen (1957), p. 219-220.

¹³ One might want to view these generalizations as mere historical vestiges of an earlier generalization in the language. If so, one could retain Kiparsky's independent vowel harmony condition. The problem is in trying to determine which generalizations are actually present in the language - that is, which ones actually exist in some psychological or real sense - and which generalizations are never realized except by some linguist. Zimmer (1968) has done some preliminary work with this problem.

make all harmonizing vowels following the first non-neutral vowel agree in backness with that vowel.

This solution claims that Zimmer's formulation of vowel harmony is correct for Finnish in so far as the vowel harmony rule applies from left to right within the morpheme as well as across morpheme boundaries. However, all the underlying vowels are fully specified rather than a mixture of archi-phonemes and fully-specified vowels; and vowel harmony is determined by the first non-neutral vowel in the word, not simply the first vowel.

This solution also makes the prediction that recent loans violating vowel harmony will be changed in accordance with the vowel harmony rule, that is, from left to right. Thus *afääri* would be changed to *afaari* rather than *āfääri*. Moreover, the restriction against *ō* as the underlying second vowel in roots claims that *likōōri* is in some recognizable sense exceptional and that we shouldn't be surprised if the word was altered in dialectical speech to something like *likoori*.

As was previously noted, the derivational suffixes beginning with a vowel appear to take underlying back vowels in the second syllable and front vowels in the third and following syllable. For example, we postulated the nominalizing suffix *o*, but noted that *o* was used to form nouns from two-syllable verbs ending in *e* or a low vowel and that the stem-final vowel never appeared:

teke + o → teko

Perhaps the reason that *o* is the underlying vowel in these nominalized forms is related to the fact that underlyingly *ō* can't occur as the second vowel in a stem. Similarly, the suffix *ōi* shows up as *ōi* only because it always forms three-syllable verb stems.

Finally, consider the hypothesis that the nominalizing suffix *o* is really underlyingly *ō* and that our general condition on the distribution of *ō* would automatically change the *ō* in the second syllable to the back vowel *o* before the vowel harmony rule would have a chance to apply. In a similar fashion, we could postulate an underlying *yyte* rather than *uute*, but change *yyte* to *uute* in second syllable stems. To do this we would need a similar restriction against *y* as an underlying second vowel in roots. Unfortunately, there are a number of words that would violate such a constraint: *hely* 'trinket', *kesy* 'tame', *letty* 'loop', *levy* 'plate', *niitty* 'meadow', *viippy* 'to remain', and so on.¹⁴ The majority of morphemes having a neutral vowel for the first vowel and a high round vowel as the second vowel have *u* as that high round vowel rather than *y*. However, it is not obvious that the above examples ending in *y* are recognizable exceptions. If they were, we could postulate another restriction:

(3) \bar{y} doesn't occur as the second vowel in roots.

The only time *y* could show up as the second vowel is when a front harmonizing vowel would occur as the first vowel in the root and an underlying *u* had been changed

¹⁴ Collinder (1960), p. 211.

to *y* by the vowel harmony rule. With such a condition we could explain the alternation of *uute*. This hypothesis is merely speculative on my part and I think rather dubious since there are a fair number of exceptions to such a restriction on the distribution of *y*.

In summary, the Finnish vowel harmony rule is needed to handle the distribution of suffixal harmonizing vowels with respect to the vowels of the preceding morpheme. I have argued that the same type of distribution among the harmonizing vowels is found to exist within morphemes themselves, thus leading to the conclusion that the vowel harmony rule applies within morphemes as well as across morpheme boundaries.

University of Illinois

REFERENCES

- Collinder, B.
1960 *Comparative grammar of the Uralic languages* (Almqvist & Wiksell: Stockholm).
- Hakulinen, L.
1957 *Handbuch der finnischen sprache* (Otto Harrassowitz: Wiesbaden).
- Kiparsky, P.
1968 "How abstract is phonology?", mimeo (Indiana University Linguistics Club: Bloomington).
- Lightner, T.
1965 "On the description of vowel and consonant harmony". *Word* 21:244-50.
- Rardin, R. B.
1969 "On Finnish vowel harmony". *QPR* 94:226-231 (MIT).
- Zimmer, K. E.
1967 "A note on vowel harmony". *IJAL* 33:166-177.
1968 "Psychological correlates of some Turkish morpheme structure conditions". *POLA* II.8 (Berkeley).