REGULAR DISHARMONY IN KIRGHIZ

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The vowels of a word may disagree in the value of some harmonic feature not only through lexical exceptionality but also because of some supervening phonetic principle. Disharmony arising from the latter cause, which we will call regular, occurs in many languages and takes many forms. Here we consider the implications of regular disharmony in the Kirghiz language as described by Wurm (1949), Hebert and Poppe (1963), and Junusaliev (1966).

1. *The Kirghiz vowel system.* Kirghiz makes a phonological distinction between long and short vowels. For convenience but not from any theoretical conviction we will write long vowels as geminates. There are eight phonologically distinctive vowel qualities:

i ü ɨ u
e ö a o

However, these vowels are fully distinctive only in roots. In suffixes it is necessary to distinguish only four underlying vowels: *A*, *I*, *O*, *U*. Each of these vowels has a number of alternant surface realizations whose selection depends on the next preceding vowel in the word. The rules governing the realization of *A*, *I*, *U* can be readily infer-

red from the following examples, each consisting of a verb plus three different suffixes *-dI* (definite past), *-gAn* (past participle), and *-UU* (verbal noun).

bildi, bilgen, bilüü 'know'
berdi, bergen, berüü 'give'
küldü, külgön, külüü 'laugh'
körd ü, körgön, körüü 'see'
kɘ́ldɘ́, kɘ́lgan, kɘ́luu 'do, perform'
aldɘ́, algan, alguu 'take'
tuttu, tutkan, tutuu 'hold'
boldu, bolgon, boluu 'be, become'

For the behavior of *O* consider the nominalizing suffix *-OO* added to lower numerals, e.g. *birööö* 'the one', *ekööö* 'the two', *üčööö* 'the three', *törtööö* 'the four', *altoo* 'the six'.

2. *Formalization.* If we assume that feature values which remain constant on the surface are underlying, then *A* and *O* must be underlying nonhigh, *I* and *U* must be underlyingly high, and *O* and *U* must be underlyingly round. *A* and *I* have both round and unround realizations but must be underlyingly nonround if they are to be distinguished from *O* and *U*. Of the vowel quality features that have classificatory relevance in Kirghiz, then, only [*back*] still remains of indeterminate underlying value in suffixal vowels. In light of known phonological universals the most natural fully specified values of these vowels are probably *a, i, o, u*, although there is little langauge-internal basis for this choice.

It is clear from the examples that the surface specification of the feature [*back*] in suffixal vowels is governed by a palatal harmony rule PHν formalizable as follows:

(PHν) V → [νback] / [V, νback] C_0___

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/bolmAkɘIŋAr/
/ǰollArdA/ →
/ǰollArInIn/

next preceding vowel is back or front. The formulation subsumes three alternative rules differing in the value of the metavariable υ, which may be +, -, or a Greek letter variable. The rules PH+ and PH- would presuppose underlying suffixal vowels */e i ö ü/* and */a ɨ o u/*, respectively, while PHα would presuppose no particular value of the feature [*back*] in suffix vowels.

The other feature that may vary in the surface representation of suffixal vowels is [*round*]. As can be seen from the examples, *A* remains unrounded if the next preceding vowel is *u*, but otherwise a suffix vowel becomes rounded if the next preceding vowel is rounded. We can formalize this situation as the following labial harmony rule:

$$\text{(LH)}\quad V \rightarrow [+\text{round}] \,/\, \begin{bmatrix} V \\ \alpha\text{high} \\ \beta\text{back} \\ +\text{round} \end{bmatrix} C_0 \begin{bmatrix} \_\_\_\_ \\ \gamma\text{high} \end{bmatrix}$$

$$\text{Condition: } (\alpha, \beta, \gamma) \neq (+, +, -)$$

The case $\ldots uC_0A\ldots \rightarrow \ldots uC_0a\ldots$, being a consequence of the structural description of this rule, constitutes a simple case of regular labial disharmony.

3. *Multiple suffix vowels.* The rules PHυ and LH account for the suffix vowels of disyllabic words without even being mutually ordered. Consider now the following examples, each containing two or more suffix vowels (morpheme boundaries omitted):

/atlArIbIzdI/ → attarɨbɨzdɨ	'our horses (accusative)'
/aydOOnIn/ → aydoonun	'of the ploughing'
/kɨštOOlArInA/ → kɨštooloruna	'to their winter quarters'
/bolmAksIŋAr/ → bolmoksuŋar	'you have to be'
/ǰollArdA/ → ǰoldordo	'in the paths'
/ǰollArInIn/ → ǰoldorunun	'of his paths'

/učInIn/ → učunun	'of its tip'
/učlArI/ → učtarɨ	'its tips'
/ǰoyIlgAnI/ → ǰoyulganɨ	'its having been lost'
/kelAČAktA/ → kelečekte	'in the future'
/birOOnIn/ → birööönün	'the one's
/künlArInIn/ → kündörünün	'of his days'
/üyInA/ → üyünö	'to his home'
/özInIn/ → özünün	'one's own'

The harmony rules PHυ and LH account for these data too provided each keeps reapplying to its own output until it can make no further change (iterative application) and if PHυ precedes LH. The necessity for iteration is intuitively obvious in the above examples but can be demonstrated more preceisely. Iterative application of PHυ will yield *kelAČAktA → kelečAktA → kelečektA → kelečekte* and *ǰoldArdA → ǰoldardA → ǰoldarda*; iterative application of LH then yields *ǰoldarda → ǰoldorda → ǰoldordo*. On the other hand if each rule applies noniteratively, even though applying simultaneously to all vowels meeting the conditions of the rule, some incorrect outputs must result. Suppose first that palatal harmony operates properly, however formulated, but that LH applies in noniterative simultaneous fashion. Then **ǰoldorda* will be derived. Hence LH must iterate. Now suppose that PHυ applies in noniterative simultaneous fashion, though labial harmony, however formulated, operates correctly. Then if $A = e$ we must have $\upsilon = \alpha$ or +, and in either case **ǰoldordö* will be derived; but if $A = a$ we must have $\upsilon = \alpha$ or -, and in either case **kelečakta* will be derived.

To see that LH must follow PHυ in any strict linear ordering consider *üyünö* and *ǰoyulganɨ*. If LH preceded PHυ one or the other of these forms could not be derived. If $I = \acute{\imath}$, then */üyInA/* will surface as **üyüne*, but if $I = \dot{\imath}$,

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then */ǰoyIlgAnI/* will surface as **ǰoyulgonu*. Thus rules which appeared to be unordered in the disyllabic case turn out to be ordered when longer sequences are considered.

4. *Simultaneously applicable reformulations.* Given underlying suffix vowels */a ɨ o u/* we could reformulate palatal harmony as

(PHS) V → [-back] / [V, -back] []$_0$ ___

In other words a suffixal vowel becomes front if preceded anywhere at all in the word by a front vowel, which is necessarily part of a root. This rule is not only simpler than PHv but can apply to all suffix vowels simultaneously and noniteratively, deriving, for example, *kelečekte* from *kelačakta* in a single step. Our arguments for iterative application therefore appear to rest on a flimsy, even incorrect foundation. In fact, though, the technique for deiterizing palatal harmony cannot be successfully generalized to labial harmony. The essence of that technique is to generalize the term *C* of the structural description of the iterative rule to include some or all vowels. Attempting this approach we come up with a labial-harmony rule like the following:

(LHX)

$$V \rightarrow [+\text{round}] \;/\; \begin{bmatrix} V \\ \alpha\text{high} \\ \beta\text{back} \\ +\text{round} \end{bmatrix} \; X_0 \; \begin{bmatrix} \underline{\quad} \\ \gamma\text{high} \end{bmatrix}$$

Conditions: $(\alpha, \beta, \gamma) \neq (+, +, -)$ and X is an appropriate class of segments.

Clearly all consonants belong to *X*, but the vowels admitted to *X* depend on the values of the Greek letter variables. For example, when β = -, i.e. in a front-harmonic word, any vowel is allowed in *X*. When (α, β, γ) = (+, +, +), i.e. when a sequence ...uX_0*I*... is in question, non-

high vowels but not high ones must be excluded from *X*; e.g. */učInIn/*→*učunun*, */učIArI/*→*učtarə*. The simultaneously applied rule LHX is thus already rather more complex than the iterative rule LH. What is worse, when (α, β, γ) = (−, +, +), i.e. when a sequence ...$\sigma X_\beta I$... is involved, there is no coherent way to define the segment class *X* at all. The derivation */ǰollArInIn/*→*ǰoldorunun* implies that both *A* and *I* belong to *X*, while */ǰoyIlgAnI/*→*ǰoyulgan*ə implies either *A* or *I* is not in *X*. If we still insist on a simultaneously applicable rule we can apparently do no better than the following:

$$V \rightarrow [+\text{round}] / \begin{bmatrix} V \\ \alpha\text{high} \\ +\text{round} \end{bmatrix} \left\{ \begin{bmatrix} C \\ V \\ \alpha\text{high} \end{bmatrix} \right\}_0 \left\{ \begin{bmatrix} C \\ V \\ -\text{back} \\ \beta\text{high} \end{bmatrix} \right\}_0 \begin{bmatrix} -\text{back} \\ \beta\text{high} \end{bmatrix}$$

Condition: $(\alpha, \beta) \neq (+, -)$

On the other hand the iterative rule LH will derive all the correct forms without difficulty or modification.

The differential susceptibility of the harmony rules to simultaneously applicable formulations results entirely from the different conditions of regular disharmony. Usually a word's vowels are all front or all back, and no special conditions exist which block the propagation of palatal harmony. The propagation of rounding is regularly blocked, however, under phonetically definable conditions, and it is the necessary blocking mechanism that creates such difficulties for a simultaneous formulation of labial harmony.

5. *Phonetic detail.* Although the feature [*low*] seems irrelevant to the phonological classification of Kirghiz vowels, a complete description must specify the value of this feature in phonetic representations. The sources

consulted make it reasonably clear that among the nonhigh vowels only *a* is low. As they stand, then, the vowel harmony rules convert *A* into *ä/ɜ/a/ɔ* or *a/ö/ʌ/o* depending on whether underlying *A* is *a* or *e*. A single *A*-adjustment rule (AA) will make the necessary changes:

$$\text{(AA)}\quad \begin{bmatrix} \text{V} \\ \text{-high} \\ \alpha\text{back} \\ \beta\text{round} \end{bmatrix} \rightarrow [\gamma\text{low}]$$

Condition: $\gamma = +$ if and only if $(\alpha, \beta) = (+, -)$

This rule must of course apply after the vowel harmony rules. In fact, as a purely phonetic rule affecting a feature having no underlying classificatory function in Kirghiz, AA might be expected not to precede any other rule at all. Alternatively, AA might be thought of as an unordered redundancy rule, applying whenever and wherever it can. We shall presently disconfirm both views, however.

The feature [*low*] could also be adjusted by the harmony rules themselves if the underlying representation of the suffix vowels were */a ɨ o u/*:

(PH') V → [-back, -low] / (same context as PH*v*)
(LH') V → [+round, -low] / (same context as LH)

Harmonically expected *a* is fronted and somewhat raised immediately before *y*. According to Wurm all front unrounded vowels are somewhat raised beyond their normal height before *y*, and the particular behavior of *a* in that context can therefore be accounted for by the following fronting rule:

(AY) [V, +low] → [-back] / ___ *y*

In other words, *ay→äy*. The scope of the rule is not entirely clear; in Wurm's data it never applies in an

initial syllable. At any rate, using ä for the fronted *a*, we can render some of Wurm's examples as follows: *kandäy* 'what kind of', *atṡndäy* 'like his horse', *aytpäy* 'without saying'. The ä of these words, though apparently in the lower mid range, is still distinct from the second *e* of *kelbeyt* 'he does not come', which has a still higher articulation.

The fronting of *a* before *y* is not noted in either the standard orthography or the phonemic transcription of Hebert and Poppe, although the effects of vowel harmony are. The implication is that the rule AY which fronts *a* applies after labial harmony and in no way interferes with the derivation of *oy* in the harmonically expected places. The available data is perfectly consistent with this view. Hebert and Poppe have many examples like *bolboy* 'without being' and Wurm gives *ošondoy* 'like that (visible)', *tokoy* (*toɣoy* in the dialect described) 'forest'. There is no suggestion in either source that the last vowel of these could ever be ä, ɔ̈, or ö.

Note, finally, that the adjustment rule AA must precede AY if it is a separate rule at all. The reverse ordering would yield **kandey*, **atṡndey*, **aytpey*. The rules developed in this paper must therefore be sequenced as follows in a strict linear ordering:

palatal harmony (PH*v* or PH')
labial harmony (LH or LH')
lowness adjustment (AA; superfluous with PH' and LH')
ay→*äy* (AY)

It can be seen now that AA can neither be last in the ordering nor freely applicable at all derivational stages, and that a surface contrast among three vowel heights exists in the context ___*y*, where *i*, *e*, and ä all occur.

6. *The effect of AY on the polysyllabic case.* Wurm (1949:101) says that vowels following the derived *äy* are normally front in the dialect he describes; e.g. *kʲälbäymin* (*kʲälbaymʲin* in the literary language) 'I do not make'. We cannot, however, derive this example from its underlying representation */kʲäl+bA+y+mIn/* on the standard view (Chomsky and Halle 1968:341 and passim) that a rule must be applied completely before any later rule is considered and cannot be returned to after any later rule has in fact applied. Applied by that convention, the rule sequence established above would always yield *kʲälbäymʲin*, which is either non-occurent or only a variant pronunciation in the dialect described by Wurm.

A natural revision of the ordering convention would allow certain sets of rules to apply iteratively in the manner of single rules. Thus an iterative rule sequence would apply completely to some single segment if it could do so nonvacuously, then to another segment, and so on until it could not apply nonvacuously to any segment. Vacuity of application would be tested for the rule sequence as a whole rather than for any individual rule, and the manner of selecting a segment at each iteration would be directionally controlled, say, or perhaps random.

So applied, the rule sequence developed in this paper will account for the Kirghiz data, although the method of segment selection is partly indeterminate. A strictly left to right direction correctly derives all the forms considered in previous sections of this paper as well as *kʲälbAymIn→kʲälbäymIn→kʲälbäymin*; cf. also *ǰoldAštAy → ǰoldoštAy→ǰoldoštoy* 'like a comrade'. Right to left direction can derive *kʲälbäymin* from */kʲälbeymin/* but must be excluded because it has the same massive undesirable effects on the individual harmony rules as simultaneous

application and the ordering of labial harmony before palatal harmony; note in particular that it would derive **ǰoldoštäy* or **ǰoldoštey* depending on whether underlying *A* is *a* or *e*. Observe that the rules become valid generalizations about surface forms if applied in the correct direction, but not if they apply in the opposite direction (cf. *ǰoldoštoy* and the forms discussed in section 3). It is true that the rule *ay→äy* (AY) creates some exceptions to palatal harmony, but that is a consequence of the rule's very existence.

Random selection of segments is also possible under certain conditions. For example, if the underlying suffix vowels are all back and palatal harmony is PHα, we can derive *kɨ́lbaymɨ́n→kɨ́lbäymɨ́n→kɨ́lbäymɨn* and either *ǰoldaštay→ǰoldoštay→ǰoldoštoy* or *ǰoldaštay→ǰoldaštäy→ǰoldoštäy→ǰoldoštoy*. But if palatal harmony were PH-, we could derive *ǰoldaštay→ǰoldaštäy→ǰoldoštäy→ǰoldoštöy*, an incorrect result.

The facts which require iteration of the entire rule sequence show too that the simultaneously applicable formulation PHS of palatal harmony cannot possibly be correct, although it seemed perfectly valid when considered in isolation. In view of *kɨ́lbäymɨn* it is clear that the palatality of a suffix vowel depends solely on that of the nearest preceding vowel, not on any more distant vowel or on some prosodic root feature spread to all suffixes by a simple convention. Like labial harmony, palatal harmony is a process of partial assimilation of one vowel to the vowel of a neighboring syllable.

R E F E R E N C E S

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Mary-Louise Kean

On a Theory of Markedness: Some General Considerations and a Case in Point

0. Introduction

It would generally be agreed that to talk about distinctions between grammatical and ungrammatical strings or to assign some measure of varying degrees of grammaticality to strings would be absurd in the absence of a clear conception of what a theory of grammar is a theory of. By the same token, to stipulate that some rule, string, etc., is marked or unmarked, or more or less marked with respect to some other rule, string, etc., would make little sense in the absence of a coherent conception of what a theory of markedness is a theory of. While, with increasing frequency, one encounters references to markedness in the literature, such discussions as there are typically take place in the absence of any attempt to define what the proper domain of markedness theories is or to characterize their role in general linguistic theory. Rather, what one usually finds is that there is an implied assumption that it is well-understood what theories of markedness are all about. However, consideration of the diversity of uses encountered and the tacit assumptions which they entail strongly suggests that there is little ground for assuming that the domain of markedness is in fact well-understood. In this paper the question to be addressed is then: what is a theory of markedness a theory of, and what is the role of such a theory in grammar? Having proposed an answer to that question, we will then turn to a specific example of a markedness theory, a theory of intrasegmental structure. Having outlined that case we will return again to considerations of markedness theories in general.