TOWARD A TYPOLOGY OF VOWEL HARMONY

HARUO AOKI

The term 'vowel harmony' has been used to cover multitudes of phenomena. Besides the classical Altaic and Finno-Ugric instances, Chiri calls certain constraints in the additional vowels in the possessed forms of nouns in Ainu, a language isolate in northeastern Japan, a result of both yoowa (vowel harmony), and Robins reports that in Yurok, an Algonkian (or Algic) language of northwestern California, there is vowel harmony and as a result certain pronominal prefixes have the same vowel as that of the non-prefixed noun. The purpose of this note is to examine the possibility of arriving at a tentative framework for typological classification of vowel harmony. I will proceed by collecting some of the phenomena labeled as vowel harmony rather than by defining what vowel harmony should be.

The first possible criterion is the **DIECTION FEATURES** which are in harmony or identically specified within certain boundaries. Some of the classificatory frames are already available, an example being the distinction of **TOTAL** (or **COMPLETE**) and **PARTIAL** harmony.

**TOTAL** harmony refers to the situation in which vowels of certain morphemes are not specified in the lexicon except for plus vocalic and minus consonantal, and the phonological rules give specifications to those of vowels in another morpheme in the same word. Examples are the illative singular suffix in Finnish, separative singular suffix in Yurok, perfective suffix of Kwanian; certain 1st and 2nd person pronominal prefixes in Moru (Miza) and Madi (Pandikor), the present tense suffix for 2nd person plural in Massa, past tense (or form) suffix in Igbo, pronominal prefix of Yurok, and dubitative prefix in Acoma. Traditionally, a similar phenomenon has been called reduplication. It is noteworthy that it is often an h or a glottal stop that intervenes between the conditioning vowel and the vowel in total harmony, perhaps indicating that features specifying vocalic segments penetrate better through an h or a glottal stop.

**PARTIAL** harmony indicates that certain vowels are only partly specified in the lexicon and the unspecified features are provided by the phonological rules, be they of the assimilation type or of the root marker type. Partial harmony may be further divided into those in which a grouping into grades of natural classes is possible and those in which it is not. The former has been classified

3. Homburger 1949, 75.
11. One of the ree Wanjin Kim, Ku&ora Chindar: Hakpo 24.5
16. Tucker 1940, 8.
19. Victoria Fromol
pheme in the same
the illative singular
dative singular suffix
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bert T. Harms, Finnish
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Tempo Ole Mpaye, A
1, 1955), 55.
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88. J. Carneochan, Vowel
Languages Studies 1.155-
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, Vowel Harmony in
2nd colloque inte-
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langue internationale de linguistique négro-africaine,
1962 (Dar es Salaam, 1963), 3-21, esp.
19. Tuucker 1940, 89.
20. Karl E. Zimner, A Note on Vowel Harmony,
IAL 38.166-71 (1937), esp. 170.
21. Nicholas Poppe, An Introduction to Aïtana
uistics (Wiesbaden, 1966).
22. Victoria Franklin, personal communication.
23. Carneochan 1960, 137.

terized by a feature is Nez Perce, an eastern
Saapian language, in which i a u form
one grade and i a o the other.25
Aside from the number and variety of
distinctive features, we may consider the
parameter of symmetry. In some harmonic
systems the harmonizing series are sym-
metric in that they are of equal power. In a
symmetric system, any vowel in a certain
position can determine the series of vowels
for the word. Examples are Finnish, Hun-
garian, Aïtana languages, Twi, and Igbo.
On the other hand, an asymmetric system
has one series dominating the other. In such
systems, the presence of a dominant vowel
in a word changes the vowels of the non-
dominant series. An example is Koryak.
Jakobson describes the situation as follows:
"In the Lhasa dialect of Tibetans, if a member
of a 'complex' contains low vowels, the high
vowels of its other members change into
sounding the words, at least in
verbs. According to Chang and Shefts,27
i e u o u are 'high' vowels and e e o o
are corresponding 'nonhigh' vowels. When
the verb base has a high vowel and the
suffix has a high vowel, except when the
suffix has been transcribed, the base vowel is raised. What is
noteworthy in Lhasa verbs is that the change
is only in the direction of raising, possibly
indicating that the high vowels are
dominant. Even when no single feature character-
izes one series against the other, the
system may be asymmetric; e.g. Nez Perce.
In an asymmetric system, the dominant

24. Haruo Aoki, Nez Perce Vowel Harmony and
Proto-Saapian Vowel Wels, Lg. 42.579-767 (1960).
series appears to be the less marked of the
two series, since the dominant series is the
one that all vowels change into with ease.
The relative sums of complexities of the
vowels in each series seem to bear this out.
For example, in Nez Perce there are five
vowels, whose distinctive feature matrix in
terms of marking conventions is shown below.

\[
\begin{array}{c|cccc}
   & i & a & o & u \\
   \hline
   low & u & u & u & u \\
   high & u & u & u & u \\
   back & - & u & u & - \\
   round & u & u & u & m \\
   complexity & 1 & 2 & 0 & 2 & 2
\end{array}
\]

The total complexity of the dominant series
(i a o) is 3 and that of the non-dominant
series (i a u) is 5. There seems to be an
important difference between a symmetric
system and an asymmetric system in that
the difference in the sum of complexities of
constituent vowels is obliterated in the
former. When one looks at the Turkish
vowel system, which is symmetric, it is
obvious that the front series is more complex
than the back series because of the existence
of costly front rounded vowels. However, the
imbalance of the complexity in the two
series does not offset the symmetry of the
system. This may serve as a support for the
condition that "a marking convention applies
either to all or to none of the segments
affected by a rule."\(^{26}\)

The third criterion is whether or not there
are alternating forms. The alternating
systems may have two or more alternating
forms depending on the number of features
left unspecified in the lexicon. For example,
in a language with only palatal harmony two
alternating forms are found, namely front
and back forms. On the other hand, in a
language with two kinds of harmony four
alternating forms are found; for example, the
third person possessive suffix in Turkish has
\(i \sim u \sim u \sim o\), and the third person
singular Tense 2 suffix in Igbo has \(e \sim a \sim o \sim a\).\(^{27}\)

The non-alternating systems are those
found in Old Japanese of the 8th century,
and Ainu, where a certain constraint in the
occurrence of vowels is observable. What is
commonly known as 'internal harmony' in
Turkish may also be considered an
example.

So far I have presented three possible
ways of classifying vowel harmony. One
further possible criterion is neutral vowels.
It appears that in none of the known cases
are the neutral vowels really neutral on a
higher level of abstraction. For example, in
Mongolian, in which \(i\) is a neutral vowel,
every native stem morpheme which now has
the neutral vowel takes only one form of
suffix. There are no cases in which a stem
morpheme may occur with either front or
back series. In short, neutral vowels seem to
be products of a low level phonological rule.
The same is true for Nez Perce. Then the
presence or absence of neutral vowels appears
to be important as a criterion. In
Mongolian and Nez Perce, two corresponding
vowels in the two series are neutralized.
There is another type of neutralization.
When there are alternating layers of differ-
ent harmonic series as in cases of horizontal
harmony, it is not difficult to imagine that a
high (or tense) vowel may be in the same
position as the non-high (or lax) vowel of
the next group up. This is a case of neutral-
ization between two non-correspondent vowels
in the two series. Twl has just such an
example in \(e\).\(^{28}\) There are nine vowels
\(i \ e \ e \ a \ o \ o \ u\). When a tense counterpart is
called for, \(i \ e \ a \ o \ u\) change to \(i \ e \ o \ u\). When a

26 From Morris Halle's handout for a phonology seminar, University of California, Berkeley, August 1967.
27 The non-alternating version of change indicates the representations on.
28 Another interesting vowel is that of \(e\) in palatal and Finno-Ugric har-
30 When we consider the marked easy to see why
31 Another possib-
32 Ladečoged 196
33 Tucker and X
34 Greenberg 196
35 William Brug
36 42.31-22 (1960). I
37 For examples cit-
38 Bongi Self-Taug
39 Zimmer 1967,
40 Homburger II
affix in Turkish has the third person Igbo has $e \sim a \sim$

systems are those of the 6th century, a constraint in the observable. What is

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is neutral vowels. Of the known cases only neutral on a n. For example, in

a neutral vowel, one which now has only one form of s in which a stem

with either front or nasal vowels seems to phonological rule.

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respondent vowels has just such an are vowels whose counterpart is to e o u. When called for, a changes.

transcription of the vowel and

stem-structure phon.

Whatever vowel occupies a certain phonological or syntactic position determines the harmony; hence the direction of harmonization is predictable. On the other hand, in an asymmetric system, a dominant vowel, whether initial, final, stem, or affix, dictates the harmony; hence there is no predictability in direction. It appears that the symmetry criteria is sufficient to take care of directionality.

In summary, I have proposed three criteria for classifying vowel harmony: (1) feature, (2) symmetry, (3) alternation; and rejected two: neutral vowels and directionality.

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OUTLINE OF STRATIFICATIONAL GRAMMAR

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This is a revised version of a booklet of the same title published, in multilingual form, in Berkeley in 1932. The changes are extensive, but the new version is still not definitive, as the author himself warns us in the Preface (iii). Stratificational theory is actively growing and changing. The outsider who wants to learn what the theory is and what it is not will find a full explication in this booklet, but he will do well to start with it anyway, consulting for further clarification the various articles to which Lamb refers.

There is a sharp difference in flavor between the work of the stratificationalists and that of the transformationists. The latter tend to adopt what has been called the 'eclipsing stance': none of the labors of earlier generations of linguists (at least, from Grimm to Bloomfield, inclusive) really accomplished anything; everything worthwhile starts with Chomsky. Lamb, on the other hand, finds much positive merit in the