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Vowel harmony in Manchu: a critical overview

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ABSTRACT

The history of generative accounts of vowel harmony in Classical Manchu is discouraging. The early treatments (Vago, 1973; Odden, 1978; Finer, 1979) assumed the wrong type of vowel harmony (front vs. back rather than relative height harmony). Hayata (1980) proposed the correct type, but was unable to justify it adequately within the generative framework. These shortcomings are due to deficiencies in the practice of generative phonologists. To demonstrate the correct type of vowel harmony in Classical Manchu requires considerations of (1) the actual surface representation and/or (2) facts in related dialects and languages. Neither type of evidence is frequently used in the practice of generative phonologists, although the former is almost always valued in theory. An implication is that attempts to improve phonology must weigh practice as well as theory.

One of the major battlegrounds between proponents of abstract phonology and proponents of concrete phonology has been the description of vowel harmony in Classical Manchu. Proponents of abstract phonology have claimed that vowel harmony was a living process in this (now dead) language which requires abstract representations to capture the true generalizations. Proponents of concrete phonology, on the other hand, have denied that abstract representations are needed to describe Manchu, with some, but not all, denying that vowel harmony is productive in Classical Manchu.

There is nothing particularly novel in the arguments that have been presented with regard to abstractness in Manchu. The same types of claims and counter-claims that have been made in other disputes about abstractness have been made in this case as well. The purpose of this paper is not to join the fray of this battle, but rather to provide meta-commentary on the entire dispute. What is interesting about the controversy, at least up until Ard (1979) and Hayata (1980), is that proponents of both abstract phonology and concrete phonology assumed the wrong type of vowel harmony for Manchu (or at least pre-Manchu if the process had ceased to be productive in the classical variety of the language). Vago (1973), Odden (1978), and Finer (1979) all assumed that vowel harmony was of the front vs. back variety, as is found in Turkish. Ard (1979) and Hayata (1980) point out that the correct type of vowel harmony in (pre-)Manchu was high vs. low.

As will be demonstrated in detail below, there is overwhelming evidence that the type of vowel harmony in (pre-)Manchu was in fact high vs. low. However, the purpose of this paper goes well beyond this into questions of phonological practice and phonological methodology. The evidence that is crucial for deciding the question is of types that are not generally considered in generative phonological practice. Furthermore, the types of evidence that are generally considered in generative phonological practice are not conclusive in pointing to one type of vowel harmony rather than the other.

The evidence that is crucial for deciding this question is of two primary types. One type involves evidence Zwicky (1975) categorizes as 'additional evidence', evidence that not all generative phonologists consider relevant. Here, facts from closely related languages and another dialect of Manchu are paramount. Here one could argue that these facts are 'external' to Manchu. For example, a speaker of Manchu with no knowledge of these other dialects or related languages would have no access to these facts.

The other type of evidence is clearly internal to Manchu; it concerns the actual surface (systematic) phonetic representation of Classical Manchu words. In theory, the surface representation is crucial for phonological theory, since every phonology contains the surface as one level of representation. In this regard, Zwicky (1975: 154) suggests that all generative phonologists consider the 'variant shapes of morphemes' to be among 'the data to be comprehended by a phonological analysis'. Nevertheless, in practice generative phonologists have not dedicated much effort to discover the nature of the phonetics of the surface shape of morphemes.

> If we consider the actual practice of generative phonologists, we notice that Schane hardly goes beyond an ordinary phonemic notation and that McCawley in his description of Japanese only includes phonological rules, not feature interpretation rules. Chomsky and Halle... on the whole...do not go any further than an ordinary phonemic level (Fischer-Jørgensen 1975: 217).

Indeed, generative phonologists have often taken existing phonemic descriptions of languages and derived a generative analysis only by considering alternations in the phonemic representations of allomorphs. This has been especially common in generative reanalyses of American Indian phonologies.

Even though evidence about actual pronunciations is internal to the language, it is external to the data which modern phonologists must use in describing Manchu, namely written texts. The information in the written texts, chiefly orthographic facts and facts about morphological relationships which can be abstracted, is insufficient to determine the actual pronunciation. The modern researcher must rely on additional evidence and/or assumptions to postulate a pronunciation for a Manchu word.

Hence, the terms *internal* and *external* are confusing. To any native speaker of Manchu, including a speaker of a homogeneous speech community, the

actual pronunciation is an internal fact: it is a part of Manchu and is learned along with the attainment of competence in the language. To a modern phonologist analysing Manchu through written texts, the actual pronunciation must also be internal to the language, but the phonologists cannot learn what the pronunciation was without relying on information external to the texts themselves. In other words, to the modern phonologist, the actual pronunciation could be said to be ontologically internal to Manchu, but epistemologically external.

External evidence from related languages and a related dialect and internal evidence based on the actual sounds in Manchu both support the high vs. low analysis. As will be discussed in more detail below, there is no evidence whatsoever in favour of front vs. back vowel harmony. Hence the former type of vowel harmony is demonstrably present in (pre-)Manchu. However, the type of evidence generally found in the practice of generative phonologists, morphological alternations and the nature of phonological rules, does not provide compelling evidence in favour of either type of harmony. Hayata (1980) suggests that these latter types of data do in fact argue for high vs. low harmony but, as will be discussed below, these arguments are not convincing.

The ascription of the wrong type of vowel harmony to a language would certainly have to be considered a grievous error. Yet the methods most commonly used in the practice of generative phonologists have been proven to be ineffective at preventing this sort of error from arising. The types of data usually considered are inconclusive, while the conclusive sorts are of the type frequently undervalued and under-used.

1. Classical Manchu refers to the language of the Manchu court, the rulers of the Ching dynasty, which controlled China from the late sixteenth to the early twentieth century. More specifically, the language in particular refers to documents written in the seventeenth and eighteenth centuries. Thus Classical Manchu by its very definition is a written language, and this creates many problems for a phonological analysis. For example, it is not clear exactly how much dialect mixture and standardisation is involved in the written form.

Even though there are a number of people of Manchu ancestry in China (Sunik (1966) notes that official Chinese figures list 2.5 million), apparently all those who are descendants of clans that formed the original Manchu confederation now speak only Chinese. There is a group of speakers called the Sibe (or Sibo), who still speak a language very close to Classical Manchu, but the Sibe were not a part of the original confederation, so their language cannot be considered a descendant of Classical Manchu. Scholars disagree on how to classify Sibe vis-à-vis Classical Manchu. Norman (1974) calls it a Manchu dialect, while Menges (1971) refers to it simply as 'gesprochenes Mañžu'.

Manchu is a Tungus language, related most closely to languages spoken primarily in Siberia. The Tungus languages form one branch of the still controversial Altaic family. The conservative opinion is that Altaic consists of Turkic, Mongolian and Tungus languages. Some scholars deny that these three groupings are genetically related, suggesting that areal factors are responsible for the resemblances. Other scholars support a more inclusive Altaic family, including Korean and, for many, Japanese.

2. There is clear evidence for residues of vowel harmony in Classical Manchu orthography. For example, one collective suffix has the variants *-sa/ -se/ -so*, another *-ta/ te*:

(1) sakdar-sa 'old person' da-ta 'chief'
gege-se 'older sister' eme-te 'mother' (data from Finer, 1979)

On the basis of these and other examples, vowels in Classical Manchu can be divided into three harmonic classes:

(2) Classical Manchu harmony types
I. *e*
II. *a o ô*
III. (neutral) *i u*

In general words with vowels of type I require affixes with vowels of types I or III, and words with vowels of type II require affixes with vowels of types II or III. The vowel harmony system is further complicated because, for certain affixes, *o* is found instead of an expected *a* due to an additional requirement of rounding harmony. The details of the vowel requirements in affixes are reported in great detail in Avrorin (1976).

The vowel harmony classes are also required in predicting the distribution of velar and uvular consonants. Velar consonants tend to occur in words containing vowels of type I, while uvular consonants tend to be found in words containing vowels of type II. Consider the adjectivizer affixes *-ŋe/ -ʁa/ -ʁo* and *-xun/ -χôn*.

(3) batuʁa 'brave' wašiχôn 'vile'
χoroʁo 'powerful' wešixun 'precious'
gexuŋe 'brilliant' (Odden, 1978: 150, 154)

Therefore, if we know that a word contains vowels of types I or II we can predict (i) vowels in affixes and (ii) the presence of velar vs. uvular consonants. However, no prediction can be made for words containing only neutral vowels (*i* and *u*):

(4) biluʁa 'calm'
mujiŋe 'having a heart'

3. There is little doubt that vowel harmony was once a productive phonological process in Manchu. Unfortunately, however, the facts that have been presented above are insufficient for uniquely determining the precise type of harmony.

Ultan (1973) presents the results of a cross-linguistic typology of vowel systems. Vowel harmony systems can be complicated due to various factors such as differences between harmony in roots and affixes, skewing of vowel patterns, the presence of neutral vowels, etc. Nevertheless, Ultan was able to discover three primary types of vowel harmony patterns based on the particular parameter that predicts the kind of vowels found in each of the harmonic classes. He found that languages distinguished vowels based on the parameters of (i) frontness, (ii) tenseness, and (iii) height. Consider the following examples.

(5) Major types of vowel harmony

A. *Front-back*
Kirghiz (Turkic)
I. (a) i (b) ü II. (a) ɨ (b) u
e ö a o
(Kirghiz also has rounding harmony: vowels must not only all be from I or II, but also must all be from (a) or (b).)

B. *Tense-lax* (a type of horizontal harmony)
Nzema (Eastern Akan)
I. i u II. ɪ ʊ
e o ɛ ɔ
ä a
(Careful phonetic studies of the parameters involved in this type of harmony have been conducted by Lindau (1975) and Jacobson (1978).)

C. *High-low* (a type of horizontal harmony)
Nanai (Tungus)
I. i u II. ɪ o
ə a

Based only on the symbols in the Manchu words given above it is impossible to determine the precise type of vowel harmony that is witnessed in Manchu phonology. The symbols themselves are based on transliterations from the Manchu orthographic system, which itself was developed from Mongolian script. Even this transliteration is controversial, since the Manchu script is replete with symbols and diacritics which allow more distinctions than any phonologist has been willing to recognize as distinctive (see Ligeti (1953) and Melles (1975)). While the transliteration itself is not crucial, the phonetic values of the sounds are. Depending on the exact pronunciations of the sounds, any of the three types of vowel harmony could be motivated for Manchu. For example, if the complex symbol *ô* represents a front or central

vowel, then it will be difficult to argue that the type of vowel harmony found in Manchu was of the front–back variety, since *ô* is grouped with the back vowel *o*. Moreover, it is important to determine if the other symbols (*i, e, a, o, u*) represent vowels reasonably close to IPA cardinal vowel values. If one or more of them does not, then this could be crucial for determining the correct type of vowel harmony which categorized Classical Manchu (or perhaps pre-Classical Manchu).

4. Even though the facts of Classical Manchu orthography underdetermine the type of vowel harmony in (pre-)Manchu, the original generative treatments all assumed that the type of vowel harmony found in the language was of the front vs. back variety. Since Odden (1978) presents a more detailed description of the actual rules postulated for Manchu, his analysis (which differs in some details from Vago's but not in details relevant for this paper) will be presented.

Odden proposes seven underlying vowels: four high vowels *i ü i* and *u*, of which the first two are front and the last two are back; and three non-high vowels *e, a* and *o*, of which only the first is front. Vowel harmony is accounted for by the following rule:

$$(6)\ [+\text{syll}] \rightarrow [\alpha\text{back}] / \begin{bmatrix} +\text{syll} \\ \alpha\text{back} \end{bmatrix} C_0 —$$

The feature [αback] is also used to account for the presence of uvulars, via a rule of velar lowering:

$$(7)\ \begin{bmatrix} +\text{cons} \\ +\text{back} \end{bmatrix} \rightarrow [-\text{high}] / — \begin{bmatrix} +\text{syll} \\ +\text{back} \end{bmatrix}$$

Since the abstract vowels *i* and *ü* do not appear on the phonetic surface, a rule of absolute neutralization is required to eliminate them:

$$(8)\ \begin{bmatrix} +\text{syll} \\ +\text{high} \\ \alpha\text{round} \end{bmatrix} \rightarrow [\alpha\text{back}]$$

Finally, a palatalization rule which applies to consonants occurring before surface *i* (phonetically [i]) is required:

$$(9)\ [+\text{cons}] \rightarrow \begin{bmatrix} +\text{high} \\ -\text{back} \end{bmatrix} / \begin{bmatrix} +\text{syll} \\ +\text{high} \\ -\text{back} \end{bmatrix}$$

Extrinsic ordering is required for these rules to operate correctly. Obviously, the abstract vowels must be present for the vowel harmony and velar lowering rules to operate. Similarly, *i* must be eliminated for the palatalization rule to have the desired effect.

Odden (1978) offers no argument whatsoever that front vs. back is the type

of vowel harmony found in Manchu. In the first paragraph of his analysis section he states 'a rule of Vowel Harmony must account for the alternation *a/e* in suffix vowels'. He presents no argument that *a* is back and *e* is front, but this assumption is necessitated by the rules he offers. Presumably the implicit assumption is that what is transliterated *e* is a front vowel, because that is what *e* represents in most languages. However, there are several languages where *e* represents a central vowel. This is especially true for languages spoken in the vicinity of Manchu, e.g. Middle Korean (Hayata, 1975), Buryat (Bertagaev, 1968), and Nanai (Avrorin, 1968). Hence, this implicit argument bears little force.

Vago (1973) does present some explicit arguments for front vs. back harmony and suggests yet other implicit ones, but none of these contains much force, either. The two explicit arguments are based on (i) the orthography and (ii) the practice of earlier grammarians. Both are incorrect.

Vago asserts (1973: 584) that the vowels transcribed by the vowels *i*, *e*, *a*, *o* and *u* 'have the usual continental sound values'. This could be true if the continent he had in mind was northeastern Asia, but it is definitely false if he means that Manchu *e* resembles the cardinal vowel [e]. Vago gave no evidence whatsoever that this remark was correct. Modern Manchu scholars are almost unanimous in their opinion that the vowel was central. Lie (1972: 48) states that the vowel transliterated *e* is phonetically [ə], analogous to the *ə* found in other Tungus languages, the languages most closely related to Manchu. Schmidt (1932: 557) describes the Manchu sound as 'aehnlich dem englischen Vokal in *but, blood, does*'. Ligeti (1953: 247) agrees, calling it 'high, mid-out, back-wide [i.e. central—J.A.], cette voyelle plus ou moins labialisée'. He further states (Ligeti, 1953: 280) that the vowel has much the same value as the *ə* in other Tungus languages as described by Cincius (1949: 78): 'mixed ("central") of mid height'. Paškov (1963: 16) seconds this comparison, adding that the acoustic value is similar to unstressed ы in Russian, a vowel that is central to back in its pronunciation. Avrorin (1976: 13) also classifies *e* as a central vowel. Virtually the only grammars that give a front value for the vowel are the very early ones (for example, Adam (1873: 15) stated that 'e a la valeur de notre è ouvert'). These early grammars, of course, could not be based on nearly as much research and data.

Thus, the consensus among scholars is that the vowel transliterated *e* did not have the value given to it by Vago. Vago's doctrinaire pronouncement that it was a front vowel is even more surprising in that one of the studies which discussed the value of *e* very carefully, Ligeti (1952), is cited in Vago's article.

Vago is also concerned with the phonetic correlate of the vowel transliterated *ô*. He assumes that it was identical in pronunciation with *u* at the time the classical texts were composed, but that it did have a different sound value at an earlier period, a conclusion shared by most Manchu scholars. He offers his view of the original sound value of *ô* as further evidence for his analysis:

> It is perhaps worth noting how the conservative orthographic system may give clues to the descriptive linguist. Recall that...phonetic [u] is represented by two different graphs, namely *u* and *ô*. This can be viewed as evidence that, at one time, these two symbols had distinct representations, being later merged by a diachronic AN rule. Thus orthographic *u* could have been phonetic [ü] and orthographic *ô* phonetic [u]. (Vago, 1973: 588).

Vago was rather careless in his consideration of the classical and pre-classical phonetic value of *ô*: he states, 'Ligeti assumes that *ô* is realized as a long o' (1973: 584). Presumably this comes from a misreading of a passage in which Ligeti discusses earlier views of the sound value of *o*:

> On a interprété *o* long (= ó), *u* long (= ū), *u* ouvert, *ü*, une voyelle entre *o* et *u*, *o* d'un timbre spécial, sans songer à ce qu'elle représentait en réalité: une simple variante du signe *u* employé après *q*, *γ*, *χ* (Ligeti 1952: 251).

As will be discussed below, the best evidence indicates that *o* did not have a more back articulation than *u*.

Vago's second argument is based on the practice of earlier grammarians: 'According to the traditional grammars, *e* is classified as front, *o ô a* as back, and *i u* as neutral.' Vago does not enlighten us as to which traditional grammars he has in mind, although a following footnote refers to Gabelentz (1832) and Budenz (1886), again both very early studies that could not have benefited from an extensive research tradition. Within grammars I have had access to, the vowels are classified as follows:

> weak (*i e u*) vs. strong (*a o ô*) (Harlez, 1884: 13):
> weak (*e*) vs. strong (*a o ô*) vs. neutral (*i u*) (Adam, 1873: 15);
> hard (*a o ô*) vs. soft (*i u*) vs. (*e*) (Paškov, 1963: 16);
> hard (*a o ô*) vs. weak (*e*) vs. neutral (*i u*) (Lie, 1972: 47);
> hard (*a o ô*) vs. weak (*e, i, u*) (Haenisch, 1961: 33).

None of these grammars classifies the vowels according to the labels of 'front' and 'back'. Therefore, one cannot accept Vago's assertion that this classification is typical of traditional grammars. Thus, the terminology of traditional grammars cannot be used to support Vago's analysis.

The most important argument for front vs. back harmony in Vago's article is an implicit one. The title of the article is 'Abstract vowel harmony systems in Uralic and Altaic'. The unmentioned assumption is that (i) since there is evidence for some sort of vowel harmony in Manchu, and that (ii) since Manchu is an Altaic language, it should have the same type of vowel harmony as other Altaic (and Uralic) languages. Clause (ii) contains a hidden assumption that is false: not all Altaic languages that have vowel harmony have harmony of the front vs. back type. All of the other Tungus languages have vowel harmony of the high vs. low or relative height variety. This type of harmony was also found in Middle Korean (Hayata, 1975). In fact, pure

front vs. back vowel harmony is clearly justified only for the Turkic languages. In many of the Mongolian languages the vowels that should count as front (e.g. *e o*) are in fact central vowels (Sanžeev, 1953). Hence, the allegedly Altaic pattern is more properly a Turkic pattern.

It is not surprising that the Turkic pattern has been taken as the basic one by Western European and American scholars, since they generally are much more familiar with Turkic languages than with other branches of Altaic. Moreover, many scholars besides Vago have made the same assertion. For example, in an article on Korean vowel harmony, Kim notes that the patterns he gives for Korean do not correspond to the Turkic type:

> ALL OF THE OTHER LANGUAGES IN THE ALTAIC FAMILY to which Korean is supposed to belong possess fairly regular palatal (vertical) [front vs. back] vowel harmony. If the palatal vowel harmony is assumed to be a common Altaic feature, shouldn't Korean have had the same in an earlier period? (1978: 227 – emphasis added).

Baitchura (1980: 16) even accuses Novikova (1960) of mislabelling X-ray photographs of vowels in the Tungus language Even because the articulation disagrees with what he would expect from his familiarity with Turkic languages (the photographs, however, do correspond to her textual description).

There is nothing wrong in using knowledge of related languages to infer the nature of a language (the caveats in section 5 below must be noted, however). On the other hand, the more closely related the languages are, the more helpful this type of information is likely to be. One would expect that the situation in Tungus languages closely related to Manchu would resemble the phenomena of Manchu more closely than would facts of much more distantly related Turkic languages (recall that some scholars deny that the Turkic and Tungus languages are related at all).

In short, none of the implicit or explicit arguments in favour of front vs. back harmony in Manchu supports the case. In fact, a closer examination of the evidence militates against front vs. back harmony.

It should be noted that the primary purpose of Vago (1973) and Odden (1978) was not to argue for the TYPE of vowel harmony, but rather to argue that abstract analyses are required to capture the true generalizations. They totally ignore the possibility that a different type of vowel harmony could have been involved, indicating presumably that this did not occur to them. Hence, they said nothing to convince readers that such an alternative was erroneous. Therefore, if the arguments for front vs. back vowel harmony as opposed to high vs. low vowel harmony were considered in a legal context, the proponents of the former would have entered a de facto 'nolo contendere' plea. In other words, they have presented no case at all that front vs. back vowel harmony is the type that is required.

4.1. An alternative non-abstract analysis of vowel harmony in Manchu has been offered by Hayata (1980). Hayata has conducted several phonological studies of East Asian languages. For example, he demonstrated (Hayata, 1975) that relative height vowel harmony was found in Middle Korean. Moreover, he had analysed the morphology of the Tungus language Orok (Hayata, 1979). Given this background in genetically and typologically relevant languages, it comes as no surprise that he recognized the error of positing front vs. back vowel harmony for Manchu. Manchu in fact has the same type of vowel harmony as does Middle Korean and Orok. Even though typological considerations presumably influenced his discovery of the type of vowel harmony in Classical Manchu, these considerations were not used in his justifications for his analysis. The justifications he gave were instead those typical of generative phonology.

In essence Hayata argues that positing high vs. low vowel harmony in Manchu allows one to dispense with absolute neutralization and still capture the true generalizations. Unfortunately, his analysis does not attain these goals.

Hayata proposes to replace the abstract analyses of Vago (1973) and Odden (1978) with a non-abstract analysis. In Hayata's analysis there are also rules of vowel harmony, velar lowering and palatalization. The last rule is virtually the same, so it will be ignored, but the first two rules are rather different. Hayata proposes six underlying vowels: two high (*i* and *u*), two non-high and non-low (*e* and *ô*), and two low (*a* and *o*). In each pair the first member is [−round] and the second is [+round]. Backness is nondistinctive, but he suggests that *e* is central and that *u* could vary in frontness according to its environment.

Given this underlying vowel system, the rules he proposes will necessarily be very different. Vowel harmony is captured by:

$$(10)\quad V \rightarrow [\alpha\text{low}]/C\begin{bmatrix} V \\ \alpha\text{low} \end{bmatrix}+C_1-$$

and velar lowering by:

$$(11)\quad \begin{bmatrix} C \\ +\text{back} \end{bmatrix} \rightarrow [-\text{high}] \quad */\$- \begin{bmatrix} V \\ -\text{high} \\ +\text{round} \\ +\text{low} \end{bmatrix}, \text{ where \$ represents a syllable boundary}$$

Note that it is the features [±low] and [+high] that are crucial in these rules rather than [±back].

Hayata claims that this formulation captures the true generalizations without requiring absolute neutralizations, but he can be challenged on both counts. First, let us consider the latter. As has been noted above, the consensus position is that in Classical Manchu any earlier distinction between the sound values of *u* and *ô* had been lost. Hayata gives little reason to

question the traditional consensus. He mentions remarks made about the phonetic value of *ô*, but these remarks refer to pre-classical Manchu. Further, in a footnote he adds: 'Hattori & Yamamoto (1956), in their description of...Sibe [the language closest to Manchu, viewed by many as a Manchu dialect; see below for more information about Sibe – J.A.] observe no "phonemic" opposition between the sounds corresponding to *ô* and *u*. They state that the consonant phonemes /k g x/ give the following vowel an acute timbre, and correspondingly /q G h/ give a grave timbre' (Hayata, 1980: 73). The mere fact that there is no 'phonemic' difference does not imply that there is a difference in the surface representation. It is quite likely that there is a measurable phonetic difference between vowel sounds after velars and uvulars, but not just in Sibe. A measurable difference presumably obtains in any language. For the notion of absolute neutralization to have any value it must refer to more than just a measurable difference. Otherwise the types of examples of absolute neutralization given by Kiparsky (1968) would have to be rejected. In languages like Hungarian the *i* in words with front vowels is measurably different from the *i* in words with back vowels. Clearly Kiparsky (1968) was not discussing the limits of phonetic measuring capability in his discussions of absolute neutralization. Rather, he was discussing sounds so distinct that they could not be predicted on general phonetic principles. What Hayata would need to show is that [u] after velars in Sibe is more different from [u] after uvulars than is the case in other languages and than could be predicted from general phonetic principles. None of the discussions of Sibe (Norman, 1974; Kałużyński, 1973, 1977; Menges, 1971; Hattori & Yamamoto, 1956) gives indication that this is the case. Hence, there is no reason to reject the traditional consensus that the phonetic values of *u* and *ô* are identical in Manchu. This means that Hayata, who denounced absolute neutralization, engaged in the process himself by positing *ô* and *u* as separate underlying segments.

Hayata differs from the abstract phonologists in which generalizations he regards as significant, and thereby worthy of being included in a phonological analysis. He argues (1980: 70–71) that only harmony in INFLECTIONS can be considered a true phonological process. This might be disputed, but what is even more controversial is his choice of what is an inflectional affix. He states (70) that 'vowel harmony proper, i.e., in inflections, is exhibited only in the verbal-adjective or participle endings: perfect or preterit...and imperfect or present.' On the preceding page we read: 'The so-called plural, or collective suffixes of Manchu are, in my opinion, derivative [presumably *derivational* – J.A.] forms.' This is far from convincing. His rules are inadequate to account for the plural forms, so it would be convenient if they could be ignored, but this neat dichotomy seems all too facile.

There are certain difficulties in the rules themselves. All grammarians have linked *a*, *o* and *ô* together in one class as opposed to *e*. However, there is no single parameter that can account for this in Hayata's system. They do not

form a natural class. This complicates the rules that operate on the vowels. The rule of velar lowering depends crucially on the roundness of the vowel, while there is no natural reason why this should be the case. It is purely an artifact of the analysis. The vowel harmony rule itself avoids referring to roundness, but at a substantial cost. As far as I have been able to determine, all forms with *ô* are marked in the lexicon as exceptions to vowel harmony. This in effect will cause forms with *e* and *ô* to be treated in opposite ways, even though the vowel harmony rule itself treats them the same. This also seems little more than a trick.

Hayata also gives some minor arguments, but these are not particularly forceful. He notes that his analysis requires 6 underlying vowels: fewer than Odden's 7 or Vago's 8. The number of underlying segments is of some value in comparing phonological analyses, to be sure, but is hardly the most important factor.

An advantage of Hayata's analysis is that the so-called neutral vowels *u* and *i* share the same value of the feature that is relevant for vowel harmony (in his system [−low]), while in analyses based on front vs. back harmony, they differ (*i* is [−back], *u* [+back]). The question remains whether this is accidental. Is it always (or even usually) the case that neutral vowels in a vowel harmony system agree on the relevant feature? It is certainly not obligatory, since in many African languages with tense vs. lax harmony, there are both neutral vowels which are tense and neutral vowels which are lax (cf. Welmers, 1973). Certainly, there are no grounds for assigning great weight to this facet of Hayata's analysis.

In summary, using only the arguments he himself presents, there is not much basis for saying that Hayata's analysis is preferable to those analyses he wished to overthrow, those based on an abstract front vs. back harmony.

5. It can be established that the arguments in favour of front vs. back harmony are not convincing and that strong arguments can be made in favour of the analysis of high vs. low vowel harmony. However, these arguments are not of the type that have predominated in the practice of generative phonologists. They concern (i) the true nature of the phonetic surface in Manchu, as determined by borrowing, the origin of the Manchu orthographic system, facts in closely related languages, and facts in the Sibe dialect of Manchu; (ii) the nature of vowel harmony in closely related Tungus languages; and (iii) phonological processes in the Sibe dialect which would greatly complicate a front vs. back harmony analysis but are compatible with high vs. low harmony.

These last two types of evidence are completely external to Classical and pre-Classical Manchu. External evidence, of course, has rightly been regarded with suspicion by linguists. Closely related languages and even dialects can differ in striking ways. For example, some dialects of Uzbek have lost vowel harmony. Punjabi has tonal distinctions, which are not found in Hindi.

Hence, external evidence is never sufficient proof for a phonological analysis. Still, external evidence is a valuable concern in justifying an analysis. Genetic and areal typologies are valid statistical (though not absolute) predictors. One would expect a sub-Saharan African language to be tonal, although some like Wolof are not. Likewise, one would not expect a Siberian language to be tonal, although Ket is. Any analysis that goes against genetic and areal typologies will call for more justification than a typologically normal one. Moreover, any analysis that goes against typologies, especially genetic ones, calls for an explanation of the divergence, e.g. how could this pattern have arisen? The author of the analysis may ignore this problem, but it is still there to be solved.

Furthermore, typological considerations are of paramount importance in the discovery of an analysis. It is surely not accidental that Vago considered Manchu to be like the more western Uralic and Turkish languages he was familiar with and that Hayata considered it more like other Tungus and north-eastern Asian languages he was familiar with. This is true even though they did not highlight typological data in their justifications. The languages Hayata knew were typologically closer than Vago's languages, so it is not surprising that Hayata was able to posit the correct type of vowel harmony for Manchu.

In the next section, I will present the internal phonetic and external evidence for the presence of relative height harmony in Manchu and pre-Manchu. Then, two analyses of vowel harmony in Manchu will be offered: one abstract and one relatively concrete. Both will be based on relative height as the determining factor. The point of this is to demonstrate that this type of vowel harmony is preferable, whether an abstract or a non-abstract analysis is adopted. Indeed, abstractness and the optimal basis for vowel harmony appear to be completely independent concerns in the description of vowel harmony in Manchu. Whatever style of phonology one prefers, relative height harmony is what is required for Manchu.

5.1. As is mentioned above, most Manchu scholars agree that the phonetic value of the symbol transliterated *e* was [ə]. This finds further support in the fact that this sound occurs in other Tungus languages in etymologically related words (Sunik, 1968: 57; Cincius, 1949). Moreover, this sound occurs in the cognate words in the Sibe dialect of Manchu (Norman, 1974). Since the value is [ə] in all of these languages and there is no information to the contrary in Classical Manchu, the assignment of this value to the Manchu symbol *e* is inevitable. Even the orthography may provide further support. The vowel that *e* represents in Mongolian has a central pronunciation in Eastern Mongolian languages such as Buryat today, and may have been so pronounced in the orthographic system from which Manchu orthography arose.

The phonetic value of the symbol *ô* is more controversial. The symbol represents the front rounded (or central rounded) vowels *ö* and *ü* in

Mongolian orthography. Schmidt (1932: 577) notes that this symbol represents *ü* in Chinese loan words into Manchu. This would indicate that *ô* originally represented a vowel somewhat more front than *u*. Summarizing various Manchu-internal evidence, Lie (1972) notes that [ū], [ō], [ü], [ō] and [ɔ) have been offered as values for *ô* compared to the value [u] for *u*. These values differ from [u] primarily in being either lower or fronter. Neither of these differences corresponds very well to Vago's suggestion that *ô* was originally [u] while *u* was originally [ü], since this would require the latter to be fronter.

Etymological evidence from other Tungus languages supports a lower value than [u] for the original value of *ô*. In those Tungus languages which maintain a lower *ụ* vs. higher *u*, Manchu *ô* corresponds to the lower sound *ụ* (Sunik, 1968: 57).

While there is no evidence that the fronting of *ô* was distinctive, its presence can be explained. As is argued in Ard (1981), the original difference between *u* and *ụ* was that the latter was pharyngealized. In several languages with pharyngealized vowels, the high back rounded pharyngealized vowels are fronted, or at least are perceived to be. This has been reported for Caucasian languages (Catford, 1977: 294), for certain African languages with tongue-root harmony (Lindau, 1975), and in X-ray photographs of vowels of the Tungus language Even (Novikova, 1960).

Based on the orthographic evidence pre-Manchu must have had a vowel system like the following:

(12) i u
ô
e o
a

This system is relatively close to that found in the Tungus language Oroč (Avrorin & Lebedeva, 1968: 192), except that in this language there is an extra neutral vowel *æ* and all vowels except *æ* occur both short and long.

(13) i u
ụ
e o
æ a

For a system such as this there is little motivation to describe vowel harmony in terms of front vs. back vowels. This will be demonstrated in detail in Section 5.3.

The different harmonic classes of vowels also co-occur with different classes of consonants. The vowels *a*, *o* and *ô* occur with uvular consonants, while *e* occurs only with velars. Vago and Odden suggest that it is the difference in vowel frontness that is responsible, but it is just as likely that the contributing factor is relative height, especially since the feature Odden uses to distinguish

velars from uvulars is [±high]. In Even, the 'soft' (i.e. relatively higher) vowels are found with velars, while the 'hard' (i.e. relatively lower) vowels are found with uvulars (Ard, 1981). Hence, it is just as likely that relative height of vowels is responsible (at least diachronically) for the velar vs. uvular difference.

§2. The type of vowel harmony in other Tungus languages is of the high vs. low or relative height variety. Summaries of the major features are found in Ard (1981) and Comrie (1981, Chapter 2.2.). There is every reason to believe that the vowel harmony patterns in Manchu developed out of the types of patterns found in closely related languages. A good scenario for the developments in Manchu is found in Avrorin (1976).

Since the vowel system of Oroč closely resembles that of pre-Classical Manchu, a brief description of vowel harmony in this language is in order. In Oroč *i* and *æ* (a vowel of this nature has only been reported for Oroč and Udihei among the Tungus languages; it is the result of changes irrelevant to the discussion at hand) are neutral. Harmony class I consists of *a* and *ų*. Harmony class II consists of *ə* and *u*. Harmony class III contains only *o*. Suffixes can be divided into three categories: type A shows an alternation *ə* ~ *a* ~ *o*, type B an alternation *u* ~ *ų*, and type C contains one of the neutral vowels *i* and *æ* and does not alternate. If the root contains vowels of class I then a type A affix will contain *a* and a type B affix will contain *ų*. If the root contains vowels of class II, then a type A affix will contain *ə* and a type B affix will contain *u*. If the root contains vowels of class III, then a type A affix will contain *o* and a type B affix *ų*. For example:

(14) I ųgda + va + n'i 'his boat'
ųgda + dų + n'i + da 'and in his boat'

(15) II xuŋkə + və + n'i 'his (sea) boat'
xuŋkə + du + n'i + də 'and in his (sea) boat'

(16) III otoŋgo + vo + n'i 'his (one-seater) boat'
otoŋgo + dų + n'i + da 'and in his (one-seater) boat'
(Note that the intervening *ų* and *i* block the requirement of *o* instead of *a*) (data from Avrorin and Lebedeva 1968: 193–4).

At an earlier stage in the prehistory of Manchu (and Oroč) there would also have been a difference between two front unrounded vowels *i* and *į* (lower), as there is in Nanai, Ulč, Orok, Negidal and Even.

§3. Sibe is undoubtedly the living language most closely related to Classical Manchu, being a dialect of Manchu but not a direct descendant of any of the dialects which formed the nucleus of Classical Manchu. Sibe phonology is not identical to the phonology of Classical Manchu, but the patterns of Sibe phonology are the most likely to provide insight as to the nature of Classical Manchu itself. Since Sibe is a dialect of Manchu, the phonological system

of Sibe is likely to be close to that of Classical Manchu. At least, any analysis of Classical Manchu that could be easily extended into a panlectal analysis that would also cover the facts of Sibe would be more highly valued than one that could not be so extended.

One of the most striking aspects of Sibe phonology is that virtually all traces of vowel harmony as a productive process have been lost. All of the suffixes that show an *ə* ~ *a* ~ *o* alternation in Classical Manchu have been neutralized, primarily to *ə* (Norman, 1974). The only residues of vowel harmony are some sporadic instances of a velar vs. uvular difference in the consonants of affixes. The conditioning factors seem identical to those found in Classical Manchu.

Even though vowel harmony has ceased to be productive in affixal morphology, the majority of roots in the language still show the residues of an earlier period of vowel harmony.

Another noteworthy feature of Sibe phonology is that assimilatory features have created new front vowels in the language. Front rounded *ö* and *ü* appear, resulting from an assimilation motivated by an *i* later in the word. Menges (1971: 40) states that this is a regular process. Kałużyński (1973: 342) gives examples of the following sorts:

(17) Sibe	Classical Sibe	gloss
ämäs	amasi	'backwards'
dövir'	dobori	'night'
fönʒi	fonʒi	'to question'
tüč	tuči	'to come out'

Palatal (or perhaps palatalized velar) stops are created through contraction of intervocalic *j* and sometimes by the monophthongization of *ai*.

(18) Sibe	Classical Sibe	gloss
tuak'a	tuwakija	'to watch'
tuk'e	tukije	'to raise'
barg'a	bargija	'to choose'
g'a, gā	gai	'to take'

These examples are interesting because they show a real palatalization of back consonants independent of the velar vs. uvular distinction, which Vago and Odden described as a type of palatalization.

These Sibe phenomena would complicate a panlectal grammar of Manchu if front vs. back vowel harmony were postulated for Manchu. In the classical language and shared classical-Sibe processes, frontness vs. backness would condition vowel harmony in roots and affixes and would condition uvulars vs. velars. In Sibe-particular phenomena, frontness and backness would have no effect on vowel harmony and would condition true palatalization. No doubt all of this could be handled given powerful enough ordering mechanisms, but this is unecessary if relative height is the salient factor for vowel harmony in Classical Manchu. Since the frontness or backness of vowels

played no role in the phonology at all, the creation of new distinctions would not wreak havoc with existing phonological processes.

Even if one were not concerned with constructing a panlectal description of Manchu, these facts from Sibe would still be valuable in justifying an analysis of Manchu. Obviously, Sibe developed from a language very close to that of Classical Manchu. Furthermore, the developments that occurred to give rise to the Sibe phonological patterns were not particularly complex. As is argued above, the Sibe patterns could easily be related to relative height harmony, but not front vs. back harmony. Likewise, the Sibe patterns could not have arisen diachronically in a straightforward manner from a language with front vs. back harmony, but could have arisen from a language with relative height harmony. This adds further credence to the claim that vowel harmony in Manchu was based on relative height.

5.4. Based on all of these facts, better analyses of Manchu vowel harmony can be constructed using relative height harmony. This is true for both abstract and non-abstract analyses. In this section abstract and non-abstract analyses for early and late Manchu will be offered in which vowel harmony is accounted for in terms of relative height.

These descriptions will be shown to be slightly better at describing the kinds of relationships covered by Odden and Hayata – vowel harmony, velar lowering, palatalization and neutralization (if any). The real advantage, however, is in rules not described by Odden and Hayata – phonetic detail rules accounting for extrinsic allophones. As has been demonstrated, especially by Hammarberg (1976), these rules are language-particular and must be a part of the phonology of the language.

In presenting the analyses I will defer an account of these phonetic detail rules until the end, because these rules will be ordered at the end of the phonological component and will be identical for both the abstract and the non-abstract analyses.

In these analyses, I will use the symbol *ə* and *ụ* rather than *e* and *ô*. The basis for this decision is that phonetic factors are crucial in deciding which analysis is best. The symbols *ə* and *ụ* correspond more closely to the actual pronunciations and are thus better choices for a representation. Note, though, that the choice of symbols has iconic rather than theoretical consequences. Within the theory of phonology, the symbols for systematic phonemes have no status at all, except to abbreviate the collection of distinctive features that characterize each systematic phoneme.

The best abstract analysis corresponds to an earlier (surface) pattern in the language, as is common in generative phonology. There is no direct evidence in Manchu for this pattern, but it closely resembles that found in another Tungus language, Orok. There are seven underlying vowels: one set of three (*i*, *ə* and *u*) and one set of four (*į*, *a*, *ụ* and *o*). A feature such as advanced tongue root could be used to separate these sets, but given the small number

of vowels, height would suffice. *i* and *i̯* are non-back; the others are all back. *a* and *o* are low; *u*, *u̯* and *o* are round.

The vowel harmony rule will, of course, be based on height:

(19) $[+\text{syll}] \rightarrow [\alpha\text{high}] \,/\, C \begin{bmatrix} V \\ \alpha\text{high} \end{bmatrix} C_0 —$

Velar lowering will look more like an assimilation:

(20) $\begin{bmatrix} C \\ +\text{back} \end{bmatrix} \rightarrow [\alpha\text{ high}] \,/\, * \quad \$ — \begin{bmatrix} V \\ \alpha\text{high} \end{bmatrix}$

Palatalization will be simplified , since the height of the vowel is irrelevant:

(21) $C \rightarrow \begin{bmatrix} +\text{high} \\ -\text{back} \end{bmatrix} \,/\, — \begin{bmatrix} +\text{syll} \\ -\text{back} \end{bmatrix}$

The Absolute neutralization rules are simplified, since they do not have to be ordered with respect to (21). Because *i* and *i̯* merged before our first records of Manchu, and *u* and *u̯* merged later, there are two separate absolute neutralization rules required, one early and one late. In other words, the early rule applies to pre-Classical Manchu, while the later rule applies to Classical Manchu:

(22a) Early neutralization

$\begin{bmatrix} +\text{syll} \\ -\text{back} \end{bmatrix} \rightarrow [+\text{high}]$

(22b) Late neutralization

$\begin{bmatrix} +\text{syll} \\ -\text{low} \end{bmatrix} \rightarrow [+\text{high}]$

In terms of feature counting, these rules are simpler than Odden's.

In non-abstract analyses there are, of course, no rules of absolute neutralization, so there is no analogue to (22a, b). The palatalization rule can remain unchanged. In early Manchu there are six surface vowels: *i*, *u*, *u̯*, *ə*, *a*, *o*, but no *i̯*. The features for these vowels can remain as in the abstract analysis above. Furthermore, the vowel harmony and velar lowering rules can remain unchanged. No prediction corresponding to abstract *i* vs. *i̯* can be made without some sort of lexical feature, of course.

In late Manchu there are only five surface vowels remaining, as *u* and *u̯* have merged. This motivates a restructuring of the non-abstract phonological description. *i* and *u* are high; *ə* is [−high] and [−low]; *a* and *o* are low; the other features are the same. Given these features, the rules of vowel harmony and velar lowering must be changed as well:

(23) Vowel harmony

$[+\text{syll}] \rightarrow [\alpha\text{low}] / C \begin{bmatrix} +\text{syll} \\ \alpha\text{low} \end{bmatrix} C_0 —$

(24) Velar lowering

$$\begin{bmatrix}+\text{cons}\\+\text{back}\end{bmatrix} \rightarrow [\alpha\text{high}] \;/\; {}^{*}\,\$ \text{—} \begin{bmatrix}+\text{syll}\\-\alpha\text{low}\end{bmatrix}$$

If a non-binary height feature could be used, then the relationship between [αhigh] and [−αlow] could be shown more directly. Again, in this non-abstract description phenomena modelled through the abstract differences between *i* and *ị* and between *u* and *ụ* could not be captured except through lexical features.

Although these descriptions are superior to those based on front vs. back harmony based just on these rules, the advantage is much more striking when phonetic detail rules are considered. Since Classical Manchu is no longer spoken, much about the phonetics remains unknown, yet certain facts are available. *i* was the only front vowel. *ə* and *a* were central. *ụ* was further front than *u* (in early Manchu when these sounds were distinct), though not necessarily as far front as the central vowels. *ụ* was lower than *u*, though probably not as low as *o*. The phonetic values will have to be multi-valued. Using the suggestion of Chomsky and Halle (1968), the maximum value of a feature will be labelled *1*. Here the minimum value will be assigned the arbitrary label *9*. Obviously there are not enough data to justify an exact numerical assignment of values to Manchu vowels, but based on the above discussion it is reasonable to assign *i* the values [9 back, 1 high], *u* [1 back, 1 high], *ə* [5 back, 5 high], *ụ* [3 back, 3 high], *o* [1 back, 9 high], *a* [5 back, 9 high]. As noted above, rules assigning values to the vowels must be a part of the phonology, since they cannot be predicted by Manchu-external facts. Starting from the underlying representations given earlier in this section, these assignment rules are simple and non-problematic, but they are complex and problematic if we start from the kind of underlying representation utilized in a description such as Odden's. Let us first consider the rules required for his system. Note that these rules are ordered at the end of the phonological component, in particular after neutralization rules. In all of these rules the affected vowels will be listed in parentheses below the structural description of the input. First, the rules for early Manchu in which *u* and *ụ* were distinct will be given:

(25) $\begin{bmatrix}+\text{syll}\\-\text{back}\\+\text{high}\\-\text{round}\end{bmatrix} \rightarrow$ [9 back, 1 high]

(i)

(26) $\begin{bmatrix}+\text{syll}\\+\text{back}\\+\text{high}\end{bmatrix} \rightarrow$ [3 back, 3 high]

(ụ (= *u* in Odden's terminology))

(27) $\begin{bmatrix} +\text{syll} \\ -\text{back} \\ +\text{high} \\ +\text{round} \end{bmatrix} \rightarrow$ [1 back, 1 high]
(u (= *ü* in Odden's terminology))

(28) $\begin{bmatrix} +\text{syll} \\ -\text{back} \\ -\text{high} \end{bmatrix} \rightarrow$ [5 back, 5 high]
(ə (= *e* in Odden's terminology))

(29) $\begin{bmatrix} +\text{syll} \\ +\text{back} \\ -\text{high} \\ -\text{round} \end{bmatrix} \rightarrow$ [5 back, 9 high]
(a)

(30) $\begin{bmatrix} +\text{syll} \\ +\text{back} \\ -\text{high} \\ +\text{round} \end{bmatrix} \rightarrow$ [1 back, 9 high]
(o)

There are several unfortunate consequences for this analysis. First, the underlying difference between *u* and *ụ* is backness, yet the one that is further back in the phonological representation is the one that is further front on the surface. Second, the underlying difference between ə and *a* is also backness, yet there is no difference at all in backness on the phonetic surface. Third, there are other complex factors in the rules which prevent significant generalizations from being made. In fact, the 'rules' are really just a list with the values given for each vowel, so there are no generalizations at all.

Compare now the rules for early Manchu based on the relative height analysis presented earlier in this section. First, the rules for early Manchu.

(31) $\begin{bmatrix} +\text{syll} \\ -\text{back} \end{bmatrix} \rightarrow$ [9 back]
(i)

(32) $\begin{bmatrix} +\text{syll} \\ +\text{back} \\ -\text{round} \end{bmatrix} \rightarrow$ [5 back]
(ə, a)

(33) $\begin{bmatrix} +\text{syll} \\ -\text{low} \\ -\text{high} \end{bmatrix} \rightarrow$ [3 back]
(ụ)

(34) $\begin{bmatrix} +\text{syll} \\ +\text{back} \\ +\text{round} \\ (+\text{roun} \\ (\alpha\text{high}) \\ (-\alpha\ \text{lo} \end{bmatrix}$
(u, o)

[Note that the feat
by (33), and there

(35) $\begin{bmatrix} +\text{syll} \\ +\text{back} \\ -\text{low} \\ -\text{round} \end{bmatrix}$
(ə)

(36) $\begin{bmatrix} +\text{syll} \\ +\text{low} \end{bmatrix}$
(a, o)

(37) $\begin{bmatrix} +\text{syll} \\ +\text{high} \\ (\alpha\text{back}) \\ (\alpha\text{round} \end{bmatrix}$
(i, u)

[Note that the feat
by (35), and there

(38) $\begin{bmatrix} +\text{syll} \\ -\text{low} \\ -\text{high} \end{bmatrix}$
(ụ)

Next, the rules fo

(39) $\begin{bmatrix} +\text{syll} \\ +\text{high} \end{bmatrix}$
(i, u)

(40) $\begin{bmatrix} +\text{syll} \\ -\text{high} \\ -\text{low} \end{bmatrix}$
(ə)

(34) $\begin{bmatrix} +\text{syll} \\ +\text{back} \\ +\text{round} \\ (+\text{round}) \\ (\alpha\text{high}) \\ (-\alpha\ \text{low}) \end{bmatrix} \rightarrow$ [1 back]

(u, o)

[Note that the features in parentheses are not required: this rule has been bled by (33), and therefore does not need to exclude *ɣ*]

(35) $\begin{bmatrix} +\text{syll} \\ +\text{back} \\ -\text{low} \\ -\text{round} \end{bmatrix} \rightarrow$ [5 high]

(ə)

(36) $\begin{bmatrix} +\text{syll} \\ +\text{low} \end{bmatrix} \rightarrow$ [9 high]

(a, o)

(37) $\begin{bmatrix} +\text{syll} \\ +\text{high} \\ (\alpha\text{back}) \\ (\alpha\text{round}) \end{bmatrix} \rightarrow$ [1 high]

(i, u)

[Note that the features in parentheses are not required; this rule has been bled by (35), and therefore does not need to exclude ə]

(38) $\begin{bmatrix} +\text{syll} \\ -\text{low} \\ -\text{high} \end{bmatrix} \rightarrow$ [3 high]

(ɣ)

Next, the rules for later Manchu:

(39) $\begin{bmatrix} +\text{syll} \\ +\text{high} \end{bmatrix} \rightarrow$ [1 high]

(i, u)

(40) $\begin{bmatrix} +\text{syll} \\ -\text{high} \\ -\text{low} \end{bmatrix} \rightarrow$ [5 high]

(ə)

this analysis. First, the
yet the one that is further
that is further front on the
ı ə and *a* is also backness,
: phonetic surface. Third,
which prevent significant
s' are really just a list with
eneralizations at all.
ied on the relative height
: rules for early Manchu.

(41) $\begin{bmatrix}+\text{syll}\\+\text{low}\end{bmatrix} \rightarrow$ [9 high]
(a, o)

(42) $\begin{bmatrix}+\text{syll}\\-\text{back}\end{bmatrix} \rightarrow$ [9 back]
(i)

(43) $\begin{bmatrix}+\text{syll}\\+\text{back}\\+\text{round}\end{bmatrix} \rightarrow$ [1 back]
(u, o)

(44) $\begin{bmatrix}+\text{syll}\\+\text{back}\\(-\text{round})\end{bmatrix} \rightarrow$ [5 back]
(ə, a)

[Note that the information in parentheses is not required, since this rule has been bled by (43)].

These rules are simpler and capture significant generalizations, as most apply to more than one vowel. Moreover, they do not neutralize or reverse differences that are important in the underlying representation.

In summary, analyses of Manchu which describe the harmony in terms of relative height are preferable for both abstract and non-abstract approaches. The advantages can be seen both in the types of rules discussed in the past literature – rules of vowel harmony, velar lowering, palatalization and neutralization – and in terms of phonetic detail rules which have not previously been discussed.

6. The situation with regard to the type of vowel harmony found in Classical Manchu (or perhaps in pre-Manchu) is as follows. (1) The types of evidence offered by Vago (1973) in favour of this type of vowel harmony are all fallacious and a deeper analysis yields evidence in favour of relative height harmony instead. (2) There is positive evidence in favour of the relative height harmony analysis based on (a) the phonetic nature of Classical Manchu, (b) the nature of vowel harmony in closely related Tungus languages, and (c) certain phonological phenomena in the extant Sibe dialect of Manchu. In theory, certain phonologists accept the importance of phonetic facts, but reject the relevance of facts from related languages and dialects. In practice, however, neither type of facts often plays a part in the justification of phonological descriptions. (3) Hayata (1980) proposed the 'right' kind of vowel harmony for Manchu, but as argued on the basis of the types of considerations typically used to compare analyses in the practice of gener-

ative phonologists, his analysis is not appreciably better than those of Vago (1973) and Odden (1978).

Presumably, Manchu vowel harmony is not a unique example of the problems in current phonological practice. Various moves could prevent these types of problems from re-occurring. The most pressing prophylactic move, however, is to return to the meaning of the first part of *phono-logy*, to *phone*, to sounds. Linell (1982) has argued that modern phonologists are often too concerned with the manipulation of abstract (quasi-)orthographic symbols, rather than with the sounds they represent. This criticism rings true for the analyses of Manchu vowel harmony. If it had been considered important to provide rigid justification for the surface representations, postulations of the erroneous type of vowel harmony in Manchu would never have arisen.

A more general conclusion should also be drawn from this discussion. It is insufficient to consider the theory of generative phonology alone in reflecting upon phonological analyses. Of even greater importance is the practice of generative phonologists. What matters most is what they do, rather than what they say they do or what they agree they should do.

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Diachronic sy in th

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ABSTRACT

Diachronic change em generations of learne information concerni learnable systems, li negative information historical linguistics u construction by the l of two types of free *quanto*-constructions first type in later cen

INTRODUCTION

Diachronic change e generations of langu through access to pre (1973) in (1).

(1)

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Grammar 1 generate On the basis of that c Grammar 2, subject (Lightfoot, 1979) tha Under this approach between O_1 and O_2 linguistics should nc 'pseudo-connexions

[1] This work has beer Sciences and Huma help in gathering t