Neutralization in Uyghur

by

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Introduction

A universal tendency to avoid unrounded mid and high back vowels is manifested in various Ural-Altaic languages in the form of a rule, Fronting, which neutralizes an original i/ɨ distinction. In the cases that have received the most attention from generative phonologists (Finnish, Hungarian, Mongolian), the resultant phonetically front vowel [i] is also phonologically (i.e., harmonically) front in all (or most) cases when not preceded by another vowel that is harmonically distinctive (i.e., when non-transparent).

In this thesis, I provide evidence from Uyghur[1] that such a correspondence between Fronting and phonological frontness is neither universal nor required. Both language-internal and comparative Turkic evidence demonstrate that Uyghur's Fronting rule is paradoxically preceded by another phonological rule assigning the opposite value, [+Back], late in the lexicon, in words containing only ultimately neutralized vowels, even those with etymologically front vowels. Words in which neutralized vowels are preceded by non-neutral vowels (the pattern that exhibits characteristics of transparency in some languages) will not support a transparency analysis of Uyghur, and require underlying assignment of feature values. Despite the complexity of this system, the model of language acquisition proposed here accounts for

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1. Uyghur (English: /wɨygɽ/, Uyghur: /ʔuyƀur/) belongs to the Turkic branch of the Altaic language family. It is probably the most important minority language in China, and is spoken mainly in the western Chinese province of Xinjiang along the old Silk Road by some eight million people either as a first language or as a lingua franca for smaller minority groups.

the system's intergenerational transmission.

I have organized this thesis into chapters according to the plan that follows in order to present the crucial data and explicate this argument. Chapter 1. lays out the underlying conflict and interplay between language universals and the vowel system of Proto-Ural-Altaic. In Chapter 2., relevant aspects of Uyghur phonology are discussed. In Chapter 3. the underlying regularity of Uyghur's harmonic patterns is illustrated. Chapter 4. differentiates the various harmonic patterns characteristic of neutralized stem vowels, thereby producing evidence for a default rule assigning [+Back] late in the lexicon. This analysis is supported in Chapter 5. by comparative and historical Turkic evidence. Chapter 6. extends this analysis to stems of shapes such as have given rise to transparency analyses in other languages, and finds additional support for the claim that the neutralized vowels must be specified for the feature [Back] at the point when harmony occurs. Chapter 7. discusses the issue of how such a complex system could arise, be remembered, and be transmitted from one generation to the next. Finally, Chapter 8. summarizes and ties together the argument of the thesis.

Chapter 1: Fronting and Neutralization

The most common 3-vowel system (i, a, u) and the most common 5-vowel system (i, e, a, o, u) (cf. Maddieson 1984) share a characteristic which is also found in a number of other vowel systems. That characteristic is the co-dependence of the features for backness and roundness among the non-low vowels. In other words, i and e are [-Back, -Round], while u and o are [+Back, +Round]. These favored systems are illustrated in (1).

(1) The most common 3- and 5-vowel systems

	[-Back]	[+Back]
[+High, -Low]	i	u
[-High, -Low]		
[-High, +Low]		a

	[-Back]	[+Back]
[+High, -Low]	i	u
[-High, -Low]	e	o
[-High, +Low]		a

This generalization regarding the co-dependence of features may be captured by the combined effects of several context-free rules, including the rule of Fronting,[2] given in (2).

(2) Fronting

$$\begin{bmatrix} -\text{Round} \\ -\text{Low} \end{bmatrix} \rightarrow [-\text{Back}]$$

This rule says that mid and high unrounded vowels always are front(ed). Fronting represents a widespread tendency among languages, and Archangeli (1984:63) has proposed that it is a universal default

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2. My use of the term 'Fronting' is not intended to imply a separate feature [Front]. I use the name 'Fronting' throughout this thesis as a convenient designation for the rule given in (2), which assigns the feature [-Back].

rule. However, there do occur marked cases in which it does not apply, as can be seen by looking at the Turkish vowel system given in (3).

(3) Turkish vowel system

	[-Back]		[+Back]	
	[-Round]	[+Round]	[-Round]	[+Round]
[+High]	i	ü	ɨ	u
[-High]	e	ö	a	o

Since the Turkish vowel system has rounded and unrounded vowels in the four corners of the vowel trapezoid, it counter-exemplifies the cross-linguistic tendency toward the co-dependence of the features for backness and rounding among non-low vowels by having one [+High] vowel that is [-Back, +Round] (/ü/), and another that is [+Back, -Round] (/ɨ/). Despite its somewhat unorthodox configuration, this vowel system seems to have remained relatively intact from ancient times. In fact, it is plausible to reconstruct the original vowel system for Proto-Turkic (Menges 1968:75, Lindblad 1989), and perhaps even for Proto-Ural-Altaic, in a form quite similar to that given for Turkish in (3).

Among the Ural-Altaic languages in their wide extension across the Eurasian landmass, this vowel system has evolved in a number of different ways (cf. Vago 1973). Some languages such as Turkish, Korean, and Kazan Tatar have not employed Fronting, and continue to have mid and/or high back unrounded vowels.

In a number of other Ural-Altaic languages Fronting has applied at some point either diachronically or synchronically, and either

lexically or post-lexically. In some languages this has produced what are often termed "transparent" or "neutral" vowels. Some of these cases have been extensively commented upon in the literature of generative phonology. In Finnish, i and e behave harmonically as front vowels when in suffixes or in stems containing no other vowels, but in stems in sequences with other vowels they are harmonically transparent (Kiparsky 1973b, Goldsmith 1985). In Khalkha Mongolian, i is harmonically front when it is the first vowel of a word, but word-medially it is transparent both to backness and to rounding harmony (Binnick 1980, Goldsmith 1985, Archangeli 1988). In Hungarian, the situation is more complicated. The vowels i, í(= i:) and é (= e:) mostly behave transparently when single, but when they occur in pairs (or longer sequences) they command [-Back] harmonic variants in suffixes. When only neutral vowels are in a root it normally takes front vowel suffixes, but there also exist about fifty exceptional stems with only neutral vowels that require back harmonic suffixes (Rice 1967:122-3 cited by Anderson 1980:290, Ringen 1988a:99, Ringen 1988b). However, leaving aside this small residual group of stems in Hungarian, we can generalize to say that in Finnish, Khalkha Mongolian, and Hungarian, the vowels that have been acted upon by the neutralizing rule Fronting always either command front harmony in suffixes or they are transparent to harmonic processes, or some combination of the two. From these cases, it might be expected that there would be a language-universal correlation between vowels that undergo Fronting and vowels that are harmonically front.

However, Uyghur does not conform to that characterization. Contrary to the expectations for a possible correlation between fronted vowels and harmonic frontness that might be raised by the patterns in other languages discussed above, in Uyghur the unmarked or default harmonic value for the high unrounded vowels that undergo Fronting is [+Back]. For example, adding the harmonizing plural suffix +lAr+ to a stem containing a high unrounded vowel of this unmarked type such as til+ 'language' results in the form tillar 'languages' with a back variant of the suffix, showing no harmonic effects from the Fronting of the stem vowel. (By way of contrast, the plural of the front-harmonic stem xät+ 'letter' is xätlär.) I will give additional examples of such unmarked vowels later in this thesis, but in order to build the argument that the vowels in question are assigned the value [+Back] by rule prior to all suffixation, it first is necessary to present certain aspects of the phonology of Uyghur in a little more detail.

Chapter 2: Elements of Uyghur Phonology

In what follows I will be using a system of notation for underspecified segments subject to harmonic processes that corresponds only partly to the more familiar one used for Turkish. In (4) are listed the special symbols used in this thesis.

(4) Symbols

	Symbol	Intermediate Harmonic Products [+Back]	[-Back]	Underlying Feature Values
a.	A	a	ä	[+Low, -Round]
b.	I	ɨ	i	[+High, -Round]
c.	U	u	ü	[+High, +Round]
d.	^{o}	u, ɨ	ü, i	[+High]
e.	G	q, ǧ	k, g	[+Back, -Continuant, ...]
f.	+	Nominal morpheme boundary		
g.	-	Verbal morpheme boundary		

The small raised ^{o} symbol in (4d) is adopted from von Gabain (1974). It is the maximally underspecified vowel in Uyghur.[3] In (4e) notice that the underspecified consonant G is always underlyingly [+Back], but in back harmonic environments it has uvular allophones and in front harmonic environments it has velar allophones. Since Chomsky

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3. In comparing the feature values in (4) b., c. and d., it may be observed that there is a three-way contrast among the [+High] underspecified vowels between [+Round], [-Round] and [ØRound]. Three-way contrasts of the values +/-/Ø may also be found for the feature [Back] among the segmental triplets a/ä/A, ɨ/i/I, and u/ü/U, and for the feature [High] among the back consonants in (4e). The existence of this type of nonbinary differentiation of feature values poses a problem for some variants of underspecification theory. However, my adoption of these three-way contrasts is simply forced by the data. As will be shown by example sets in the following section, there exist high vowels in suffixes subject to backness harmony that always appear as [+Round], that always appear as [-Round], and that harmonize for rounding.

& Halle (1968:307) characterize uvulars as [+Back, -High], while velars are [+Back, +High], a rule formulated in their framework must correlate plus/minus [High] consonants to minus/plus [Back] vowels respectively. I will not formulate this rule here, but what is important for the argument of this thesis is that the reader observe the correspondences between harmonic backness and the different allophones of the back consonants in (4e). In (4f) and (4g) the use of '+' to mark nominal morpheme boundaries and '-' to mark verbal morpheme boundaries is standard Turkological notation, which I believe was proposed originally by von Gabain, and should not be confused with the '+/-' feature notation of generative phonology, which I also use.

The underlying system of vowels in Uyghur for which I will argue is given in (5). The unrounded mid vowels ɘ and ɤ appear in parentheses because they do not occur underlyingly in native words. However, ɘ does occur frequently in foreign loans in underlying forms, and it also can occur in native words on the surface as the product of rules.[4] The mid back unrounded vowel ɤ is found extremely rarely as an underlying segment (in loanwords from Chinese), although it does arise both during derivations as an intermediate product of a vowel-raising rule and on the surface as a product of a rule of i-Allophony, as will

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4. The elimination of ɘ from the underlying inventory of vowels in Uyghur is somewhat problematic. The two rules producing [e] that will be discussed below, namely Initial Vowel Raising and i-Allophony, both are relatively straightforward. However, there are additional examples of ɘ for which they cannot account, and which I attribute to additional rules of vowel dissimilation and pre-palatal raising within the native vocabulary. Since these latter rules are not germane to the argument of this thesis, I will not pursue this matter further here.

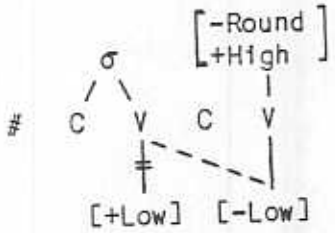
be seen below. A comparison of (3) and (5) will reveal that the underlying vowel systems of Turkish and Uyghur are remarkably similar.

(5) Uyghur underlying vowels

	[-Back] [-Round]	[-Back] [+Round]	[+Back] [-Round]	[+Back] [+Round]
[+High]	i	ü	ɨ	u
[-High, -Low]	(e)	ö	(ɤ)	o
[+Low]	ä		a	

In (6) and (7) I give the rules of Initial Vowel Raising and Secondary Vowel Raising. These both are cyclic lexical rules that are restricted to derived contexts.[5]

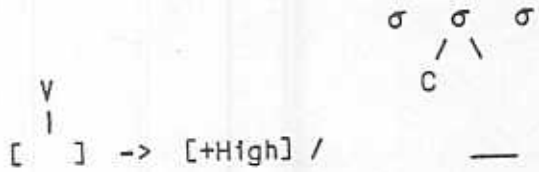
(6) Initial Vowel Raising



5. Anderson's (1974:64) rule of Umlaut combines the effects of my rules of Fronting and Initial Vowel Raising into a single rule. This misses the generalization that Fronting also applies to unrounded high vowels, whether underlying or produced by Secondary Vowel Raising, a generalization that I capture by formulating Fronting as a separate rule. Since the raising rules for low vowels in initial and in secondary syllables differ both in terms of structural description and of structural change, they clearly must be formulated separately. By formulating Fronting as a separate rule, both of these rules can be formulated much more simply, and (in my opinion) much more naturally. Tohti's (1986/1987:125) two rules of vowel raising pose similar problems of unnecessary complexity and missing the generalization afforded by Fronting. Neither Anderson nor Tohti is working in a framework of Lexical Phonology, so they do not recognize the theoretic significance of the failure of raising to apply to underived forms such as mašina 'machine.'

Initial Vowel Raising affects only word-initial open syllables, changing short, low vowels to mid by assimilation to the feature [-Low] of the following high, unrounded suffixal vowel.[6] (See (10) below for sample derivations.)

(7) Secondary Vowel Raising



Secondary Vowel Raising affects only non-word-initial open syllables, and changes short, low vowels to high whenever they are immediately followed by another syllable whose vowel belongs to a different morpheme. Secondary Vowel Raising applies both lexically and postlexically.

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6. Uyghur dialects differ considerably in regard to the changes produced by Initial Vowel Raising (Hahn 1986, pc; Tohti pc). The analysis presented here describes the standard dialect spoken in China; in other dialects, the output from Initial Vowel Raising (and perhaps other rules as well) includes such variants as (a) a > e and ä > i, or (b) ä > e and a > ä, or (c) a > ä (neutralizing the distinction, with no raising). Tohti (pc) has suggested the possibility of an ad hoc solution whereby these vowels are each assigned numbers: a = 1, ä = 2, e = 3, i = 4; then in dialect (a) this rule would say 'Add 2' and in dialect (b) it would say 'Add 1'. I reject this approach because I can see no theoretic basis for it, but I have no other alternative solution to put forward to handle these dialects. Hahn (pc) contends that the variation found among the dialects in regard to the application of raising and fronting to initial and secondary syllables argues against my analysis with its simple rule of Fronting that applies to both mid and high vowels, while conceding that my analysis does describe the standard dialect of Uyghur spoken in China. Hahn (to appear b) agrees with Anderson (1974) in combining Initial Vowel Raising and Fronting into a single rule of Umlauting.

Because both of the vowel raising rules are cyclic lexical rules that apply only in derived contexts, they can affect roots only by raising the vowel of the final syllable when something is added. Thus, Initial Vowel Raising applies to taš 'stone' + ^{o}m 'my' -> təšim, but not to mašina 'machine' (*məšina). Similarly, Secondary Vowel Raising applies to qazan 'pot' + I 'their' -> qazini, but not to afğanistan 'Afghanistan' (*afğinistan), which is underived from a Uyghur perspective (though not from a Persian one). Both vowel-raising rules feed Fronting by changing the low vowels /ä, a/ into unrounded mid or high vowels, thereby giving them the features required by Fronting's structural description, though the feeding relationship is effectively vacuous in the case of the already [-Back] vowel ä.

Uyghur's syllable structure constraints allow only CV and CVC syllables. (This marks it as a type III language in the typology of Clements & Keyser 1983:29). A number of phonological rules in Uyghur are directly dependent on syllable structure. First, syllabification rules are needed to link up consonants with vowel nuclei as onsets and codas. Second, rules of prothesis and epenthesis are needed to provide segmental material to fill unlinked C and V slots that arise in the structure generated by the syllabification rules. Both of these types of rules that build or change syllable structure must apply on each cycle as new suffixes are added. For example, adding a suffix consisting of a single consonant to a consonant-final word will result in both the epenthesis of a vowel between those consonants and the resyllabification of the previously word-final consonant as the onset of the new

syllable. Both Initial Vowel Raising and Secondary Vowel Raising crucially refer to the new structure that results from resyllabification in their structural descriptions.

At least one rule that is relevant here must follow Fronting, namely i-Allophony. I base this assertion in part on the statement by Hahn quoted in (8).

(8) "On the basis of frequency of occurrence, Zhāng and Mèng assume [ɪ] to be the underlying value of the phoneme /i/, or of what in the Modern Uighur Romanization is rendered as 'i'."

--Hahn 1986:43

As will soon be apparent, the single written letter 'i' in Uyghur can behave harmonically as either a front or a back vowel, because Fronting neutralizes the underlying distinction between /i/ and /ɨ/. I argue that Zhang & Meng (1982) are in error in seeing only a single phoneme /i/, but I believe that they are essentially correct in their assumption that a high front vowel underlies the pattern of allophony. My contention is that no specific phonetic vowel such as their [ɪ] is underlying in any absolute sense, but rather that the neutralizing rule of Fronting gives very similar results in the form of the high front unrounded vowel /i/.[7]

The number of allophones produced by i-Allophony has been given variously as eight, eleven, or fourteen in Hahn (1986), Zhang & Meng (1982), and Hahn (to appear a), respectively. The analysis proposed by

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7. Hahn (to appear a) makes a similar argument.

Hahn (1986), which contains the minimal eight allophones, is given in (9). (Do not confuse Hahn's use of [ɨ] for a phonetically central vowel in (9) with my usage of /ɨ/ for a phonologically back vowel elsewhere in this thesis.)

(9) [Allophones of /i, ɨ/; i.e., results of i-Allophony]

	front	center	back
high-tense	i	ɨ	
high-lax	ɪ		ʉ
mid-tense	e	ë	ɤ
mid-lax		ə	

--Hahn 1986:47

Because Fronting neutralizes the difference between phonologically front /i/ and back /ɨ/ before i-Allophony applies, /i/ and /ɨ/ share the same set of allophones. The choice of allophones is based on the immediate phonetic environment, and especially the adjacent consonants. Thus, for example, the genitive suffix +nIŋ+ is always pronounced with schwa as its vowel (Hahn 1986:46), regardless of its backness value as revealed by harmonic processes.

In (10) are shown the derivations of two words, one of which is back harmonic and the other front harmonic. Because they occur in almost identical phonetic environments, the vowels in (10) that are subject to Fronting and i-Allophony surface phonetically identical, despite their different feature values before Fronting neutralizes those differences, and despite the different harmonic features that they transmit to subsequent suffixes. (Note that the bracketing in

these derivations in (10) and that below in (15) marks the derivational cycles, not phonetic notation as elsewhere in this thesis.)

(10) bar- 'go!', bär- 'give!', -^{o}š+ 'participle', +lAr+ 'plural'

First Cycle		
σ -Rules	[bar] ^{o}š]	[bär] ^{o}š]
V-Harmony	ɨ	i
(6) IVR	ɤ	e
Bracket Erasure	[bɤr ɨš]	[ber iš]
Second Cycle		
σ -Rules	[bɤrɨš] lAr]	[beriš] lAr]
V-Harmony	a	ä
Bracket Erasure	[bɤrɨš lar]	[beriš lär]
Postlexical		
(2) Fronting	e i	(applies vacuously)
i-Allophony	ɪ	ɪ
Phonetic Representation	[berɪšlar] 'goings'	[berɪšlär] 'givings'

I contend that both Fronting and i-Allophony are postlexical rules. Fronting absolutely neutralizes underlying distinctions, while i-Allophony produces novel segments and gradient results. Both rules apply exceptionlessly across the board, which is typical of postlexical rules (Kaisse & Shaw 1985). In the derivation in (10) of berišlar 'goings', it is clear that if Fronting applied at any point on the First Cycle, or if it applied on the Second Cycle prior to the spread of vowel harmony, then the feature [+Back] would be lost and could not spread to the suffix +lAr+. Therefore I conclude that rule-ordering requires Fronting to be postlexical, and because i-Allophony is fed by

Fronting, a fortiori it must be postlexical as well.

One feature of the neutralization produced by Fronting is that the underlying distinction between /i/ and /ɨ/ is neutralized in Uyghur orthography. Thus, Uyghur spelling is based on the stage after Fronting has applied, but before i-Allophony.[8] (I use transliterated standard spellings in this thesis except where marked otherwise.)

As we have seen, in Uyghur, Fronting is only one of a complex set of interacting phonological rules[9] that radically transform the underlying forms of vowels to produce their surface shapes. At least two other rules feed Fronting by raising low vowels in certain environments. Fronting applies only postlexically as a rule of absolute neutralization, and so it has no effect on the cyclic lexical rules of vowel harmony that transmit underlying values for backness to suffixes. I assume that Fronting must apply somewhat earlier in derivations in Finnish, Hungarian and Mongolian, but its precise location in those languages is outside the scope of this thesis.

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8. An additional characteristic of postlexical rules is that native speakers typically are unaware of their occurrence. For Fronting to be reflected in the orthography suggests that it might belong to a recently identified class of rules, intermediate between lexical and postlexical rules, Pl rules (Kaisse to appear). That could provide an explanation for the fact that native speakers are in sufficiently conscious command of Fronting to reflect it in their writing system, notwithstanding its other postlexical aspects.

9. Largely omitted from discussion here are other phonological rules deemed non-germane to the argument, such as another postlexical rule that devoices many high vowels, final devoicing, epenthesis, etc.

Chapter 3: Regular Harmony

In essence, the patterns of harmonic spreading in Uyghur are much like those described for other languages. Segments in roots are fully specified for all features in the lexicon and their harmonically spread features are unaffected by affixation, while underspecified segments in affixes take on features that they lack from the stems to which they become affixed. Although we will have occasion below to observe exceptions to both of these generalizations about completeness of feature specifications,[10] it is nonetheless true in broad terms that harmony spreads from fully specified roots to underspecified suffixes.

I will not go into the operational details of backness harmony here. Briefly stated, I assume an autosegmental process resembling in most ways the approach to harmony in Turkish taken by Clements & Sezer (1982). However, interactions with the cyclic raising rules require that harmony spread cyclically to each new suffix as it is added, as will be touched upon in the discussion of the sample derivations in (15) below. I also assume that harmony never changes feature values, but only fills gaps by spreading missing features to underspecified segments (cf. (4) and footnote 3). Example sets (11), (12), (13) and (14) illustrate the regular operation of the spreading of harmony from each of the eight underlying vowels to the four underspecified vowels A, I, U, and O and the underspecified consonant G that we saw in (4) a. through e.

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10. I will argue that the roots in (22) receive the feature [+Back] by rule. Several varieties of suffixes that are fully specified for all features will be touched upon in 6.1.

(11) +lAr+ 'plural', +GA+ 'dative'

a.	yol+	road	yol + lAr + GA	->	yollarğa	to/for roads
b.	pul+	money	pul + GA	->	pulğa	to/for money
c.	at+	horse	at + GA	->	atqa	to/for a horse
d.	qiz+	girl	qiz + lAR + GA	->	qizlarğa	to/for girls
e.	köl+	lake	köl + GA	->	kölgä	to/for a lake
f.	yüz+	face	yüz + lAr + GA	->	yüzlärgä	to/for faces
g.	xät+	letter	xät + GA	->	xätkä	to/for a letter
h.	pikir+	opinion	pikir + lAr + GA	->	pikirlärgä	to/for opinions

(12) +ImIz+ 'l plural possessive', +GA+ 'dative'

a.	yol + ImIz + GA ->	yolimizğa	to/for our road
b.	pul + ImIz + GA ->	pulimizğa	to/for our money
c.	at + ImIz + GA ->	etimizğa	to/for our horse
d.	qiz + ImIz + GA ->	qizimizğa	to/for our girl
e.	köl + ImIz + GA ->	kölimizgä	to/for our lake
f.	yüz + ImIz + GA ->	yüzimizgä	to/for our face
g.	xät + ImIz + GA ->	xetimizgä	to/for our letter
h.	pikir + ImIz + GA ->	pikirimizgä	to/for our opinion

(13) -GU+ 'gerund', +čI+ 'agent', +lAr+ 'plural'

a.	bol-	become!	- GU + čI + lAr	->	bolğučilar	becomers
b.	oqut-	teach!	- GU + čI + lAr	->	oqutqučilar	teachers
c.	yaz-	write!	- GU + čI + lAr	->	yazğučilar	writers
d.	tiq-	insert!	- GU + čI + lAr	->	tiqqučilar	inserters
e.	kör-	see!	- GU + čI + lAr	->	körgüčilär	watchers
f.	küt-	wait!	- GU + čI + lAr	->	kütküčilär	waiters
g.	käl-	come!	- GU + čI + lAr	->	kälgüčilär	comers
h.	tik-	sow!/sew!	- GU + čI + lAr	->	tikküčilär	sowers/tailors

(14) +^{o}m+ 'l singular possessive', +GA+ 'dative'

a.	yol + ^{o}m + GA ->	yolumğa	to/for my road
b.	pul + ^{o}m + GA ->	pulumğa	to/for my money
c.	at + ^{o}m + GA ->	etimğa	to/for my horse
d.	qiz + ^{o}m + GA ->	qizimğa	to/for my girl
e.	köl + ^{o}m + GA ->	kölümgä	to/for my lake
f.	yüz + ^{o}m + GA ->	yüzümgä	to/for my face
g.	xät + ^{o}m + GA ->	xetimgä	to/for my letter
h.	pikir + ^{o}m + GA ->	pikirimgä	to/for my opinion

The first four stems in these example sets are harmonically [+Back], and the second four are [-Back]. Clearly, back stem vowels govern back alternants in suffixes, and front vowels in stems govern harmonically front suffixes. The only surface exceptions may be seen by comparing the final examples in each subgroup of four, all of which contain the absolutely neutralized vowel I in their roots. These examples clearly demonstrate that some I's are harmonically front and others are back in Uyghur, as in Hungarian. Although some suffixes, such as the first person plural possessive suffix seen in (12), never are marked for backness on the surface because they are always subject to Fronting, nevertheless there is no reason to believe that they fail to undergo and transmit vowel harmony in the regular way. That is to say, I believe that harmony is always a local process, dependent only on the nearest relevant segment, and that underspecified vowels always borrow any missing features from the immediately preceding vowel.

It is not appropriate to describe I as being transparent any more than A, O, or U. Rather, these vowels are underspecified, and they borrow any feature values that they lack from the immediately preceding vowel. If the vowel following them is underspecified for the same feature, it also borrows that feature specification from its immediate neighbor. This spreading of harmony is a cyclic lexical process that goes on with complete regularity, with no consideration of the possibility that the future application of the postlexical rule of Fronting may later neutralize the feature of backness. Thus, in examples (13)a. through d., the feature [+Back] spreads from the root to -GU+,

from -GU+ to +čI+, and from +čI+ to +lAR+, all in exactly the same way. Harmony does not skip over +čI+ any more than it skips over -GU+.

In order to illustrate the interactions between various rules that have been discussed, I give derivations in (15) of kütküčilär 'waiters' (=(13f.)) and atlirimizğa 'to/for our horses'. (Note that the bracketing in these derivations, like that in (10) above, marks the derivational cycles, not phonetic notation as elsewhere in this thesis.)

(15) küt- 'wait!', -GU+ 'gerund', +čI+ 'agent', +lAr+ 'plural', at+ 'horse', +ImIz+ '1 plural possessive', +GA+ 'dative'

Underlying Representation	[küt] GU] čI] lAr]	[at] lAr] ImIz] GA]
Root Cycle		
σ -Rules	[küt] 'wait!'	[ʔat] 'horse'
First Cycle		
σ -Rules	[küt] GU]	[ʔat] lAr]
V-Harmony	ü	a
G-Harmony	g	
Voicing Assim.	k	
Bracket Erasure	[küt kü] 'waiting'	[ʔat lar] 'horses'
Second Cycle		
σ -Rules	[kütkü] čI]	[ʔatlar] ImIz]
SVR		ɨ
V-Harmony	i	ɨ ɨ
Bracket Erasure	[kütkü či] 'waiter'	[ʔatlɨr ɨmɨz] 'our horses'
Third Cycle		
σ -Rules	[kütküči] lAr]	[ʔatlɨrɨmɨz] GA]
V-Harmony	ä	a
G-Harmony		ğ
Bracket Erasure	[kütküči lär] 'waiters'	[ʔatlɨrɨmɨz ğa] 'to/for our horses'

(15) (Continued)

Postlexical

Fronting	(applies vacuously)	i i i
i-Allophony	i	ɪ ɪ ɪ
Hi-V Devoicing	ü ü	
Phonetic Representation	[kütkü̥čilär]	[ʔatlɪrɪmɪzğa]

Several aspects of these derivations merit comment. To avoid irrelevancies and unnecessary detail, I have simplified the derivations in (15) by combining the effects of all of the syllable structure building and changing rules at the start of each cycle under the heading 'σ-Rules'. On the root cycle, this requirement for proper syllabification on every cycle results in glottal stop prothesis before vowel-initial words such as at+ 'horse'. On the second cycle, r must resyllabify across the bracket in order to create the open syllable la before Secondary Vowel Raising can apply, but the bracket must not be erased until the end of the cycle or it would destroy the derived context needed for raising to apply. On the other hand, brackets must be erased at the end of every cycle to avoid providing contexts for overapplication of rules, such as triggering Initial Vowel Raising by Secondary Vowel Raising.[11]

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11. An illustration of a derivation with the potential for such an interaction of rules is that of the word yazimän 'I write', which superficially appears to satisfy the structural description for the application of Initial Vowel Raising to the root yaz- 'write!' In fact, however, because of the cyclic operation of suffixation, when the suffix -A+ ('imperfect converb') is added on the first cycle, the result is yaza+, which does not meet the structural description of Initial Vowel Raising. The erasure of internal brackets at the end of the first cycle insures that when cliticization of +män ('I') triggers

Although most suffixes are monosyllables, +ImIz+ probably should be regarded as a single unit.[12] If +ImIz+ is a single unit, but vowel harmony spreads only from one vowel to the immediately following vowel as I have asserted earlier, then it would seem that two iterations of harmonic spreading are required on the second cycle to spread the feature [+Back] to +ImIz+.

That the postlexical rules of Fronting and i-Allophony apply to the ɨ derived from the suffix +lAr+ is no more relevant to the regularity of Uyghur's patterns of harmony than that they apply to the ɨ's that derive from +ImIz+, or than the postlexical devoicing of the first two vowels of kütküčilär. Although all of these postlexical rules (or even the lexical rules) may pose obstacles for the recognition of underlying harmonic patterns, especially for non-native speakers, nevertheless they do not constitute any real proof that the system of harmony has broken down, contrary to Poppe's (1965) contention.

So far we have seen that all eight of the underlying vowels transmit their underlying feature values for backness to following suffixes.

Secondary Vowel Raising on the second cycle, the structural description of Initial Vowel Raising cannot be met by the new high unrounded vowel that would cause raising if it were present already on the first cycle. That the root yaz- is not prevented from raising by length is demonstrated by the regular occurrence of Initial Vowel Raising whenever yaz- is suffixed by a vowel that already has the features [+High, -Round] on the same cycle where suffixation occurs, e.g. yeziš 'writing' (< yaz-^{O}š).

12. The alternative would be to regard it as a combination of the two units that it is historically derived from, namely +^{O}m+ and what may perhaps be an archaic dual or plural +^{O}z+. However, both the non-productivity of the latter suffix and the altered nature of the vocalism (failure to harmonize for roundness) argue against such an analysis for Modern Uyghur.

In the next section we will look more closely at roots that contain only vowels that are subject to neutralization, so that their underlying harmonic nature can be revealed only by their effect on suffixes.

Chapter 4: Harmonic Patterns of Neutralized Vowels

Words whose only vowels are i or e can be separated into five groups on the basis of their harmonic characteristics, as shown in (16).

(16) Subsets of stems with only the neutralized vowels i and e

a. a limited number of words lexically listed as [-Back] (=17)
b. a limited number of words lexically listed as taking both [+Back] and [-Back] suffixes (=18)
c. all words marked [-Back] by the velars /k, g/ (=19)
d. all words marked [+Back] by the uvulars /q, ğ/ (=20)
e. all other words assigned [+Back] by default rule (=22)

The words referred to in (16a) form a small closed set. In (17) I give all of the examples of this type that I was able to find in Tohti (1986/1987), as well as those that were given in the discussion of this harmonic pattern by Shinjang Uyghur Aptonom Rayonlug Millätlär Tilyeziq Xizmiti Komiteti (Committee on matters of language and writing systems for the nationalities of the Xinjiang Uyghur Autonomous Region) (1985) in the introduction to their Uyghur spelling dictionary. It can be seen from the inflected forms of these roots in (17) that they all are harmonically [-Back]. Although this is the predominant (or only) pattern for words with neutralized vowels in certain other Ural-Altaic languages, we will soon see evidence that such is not the case in Uyghur. I will argue below that the feature [+Back] is assigned to a similar set of words in (22) by a default rule. Therefore I hypothesize that these words in (17) must be lexically listed with the feature [-Back]. It may be worthwhile to point out that several of these words

also have irregular inflectional patterns in English: drink-drank-drunk, ride-rode-ridden, know-know-known, get-got-gotten, we-us-our, you-your, one-first, and possibly others. Since many of the words in (17) refer to very basic activities and concepts, their frequency of usage can be predicted to be so high as to allow a language learner to acquire them very quickly and, through frequent reinforcement, remember easily not only a base form but also irregular inflected forms. Only a very few of these items, such as (17r), are the sort of specialized words known only by an educated elite.

(17) Lexically listed [-Back] (=16a)

a.	ič-	drink!	- mAG	->	ičmäk	drinking
b.	min-	ride!	- mAG	->	minmäk	riding
c.	bil-	know!	- mAG	->	bilmäk	knowing
d.	itti-	push!	- mAG	->	ittimäk	pushing
e.	čiri-	decay!	- mAG	->	čirimäk	decaying
f.	intil-	dedicate!	- mAG	->	intilmäk	dedicating
g.	ič+	interior + I	+ GA	->	ičigä	to/for its interior
h.	biz+	we	+ GA	->	bizgä	to/for us
i.	siz+	you [polite sg.]	+ GA	->	sizgä	to/for you
j.	sili+	you [respected older person]	+ GA	->	siligä	to/for you
k.	bir+	one	+ lAr	->	birlär	ones
l.	tez+	fast	+ l°G	->	tezlik	speed
m.	šilim+	glue	+ GA	->	šilimgä	to/for glue
n.	bilim+	knowledge	+ GA	->	bilimgä	to/for knowledge
o.	ilim+	science	+ GA	->	ilimgä	to/for science
p.	ǰiddiy+	tense	+ l°G	->	ǰiddiylik	tenseness
q.	imin+	Imin [m. name]	+ GA	->	iminga	to/for Imin
r.	nispiy+	proportional	+ l°G	->	nispiylik	relativity
s.	filim+	movie	+ GA	->	filimgä	to/for a movie
t.	retim+	rhythm	+ GA	->	retimgä	to/for rhythm
(for some speakers, also:)						
u.	eriš-	get!	- mAG	->	erišmäk	getting
v.	beyǰiŋ+	Beijing	+ GA	->	beyǰiŋgä	to/for Beijing

An example of a stem with only neutral vowels that could be included in (17) because it takes front harmonic suffixes is beril- 'be provided!' I have omitted it because I consider it to be synchronically derived from bär- 'give!' and a passive suffix -^{O}l- through Initial Vowel Raising. Other similar examples could be produced. Although I have found only about twenty stems in Uyghur of the type in (17), it is quite possible that future research could reveal a number sufficient to match the fifty Hungarian neutralized stems that must be lexically listed due to their exceptional harmonic backness (a near mirror-image of the Uyghur case). However, I expect that my sources have included the bulk of the high-frequency stems of this type.

A very small set of roots that idiosyncratically take both [+Back] and [-Back] suffixes have been identified by Shinjang Uyghur Aptonom Rayonluq Millätlär Til-yeziq Xizmiti Komiteti (1985:23). In my analysis, the common characteristic of the five instances that they have identified is that the base form, whether nominal or verbal in nature, has the unmarked [+Back] harmonic value, but certain derived forms have been lexicalized with the value [-Back]. In examples (18) a., b. and c. the noun stem is basic and all of the nominal inflected forms are [+Back], but forms derived with the denominal-verbal suffix +lA- are lexically marked [-Back].[13] In examples (18) d. and e. the verb stem

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13. That the denominal-verbal suffix +lA- is not inherently [-Back] is shown by multitudinous regular examples in which it displays and transmits the harmonic backness values of stems to which it is attached, e.g.,

baš	+	lA-	->	bašla	- mAG	->	bašlimaq
head		N->V		start!	participle		starting

is basic and all of the verbal inflected forms are [+Back], but specific nominal forms derived from those roots have acquired lexicalized meanings along with [-Back] harmonic features. Clearly, phonetic conditioning cannot explain cases such as these, and lexical assignment of values must be assumed for the words in (18). (In (18) suffixal segments reflecting harmonic values are underlined.)

(18) Stems taking both [+Back] and [-Back] suffixes

a. iz+ 'trace, footprint', iz+lar 'traces', iz+ǧa 'to/for the trace'
a'. iz+lä-/iz+dä- 'search!, track!'

b. iš+ 'work', iš+lar 'jobs', iš+ǧa 'to/for the job', iš+liq 'occupied'
b'. iš + lä- 'work!'

c. čiš+ 'tooth', čiš+lar 'teeth', čiš+liq 'having teeth'
c'. čiš+lä- 'bite!'

d. il- 'hook!', il-maq 'hooking [regular verbal noun]', il-ǧu 'hanger', il-ǧan 'having hooked', il-sa 'if he hooks'
d'. il-mak 'a certain type of hook used by butchers'

e. tiz- 'arrange!', tiz-maq 'straightening', tiz-ǧan 'having arranged', tiz-sa 'if he displays in order', tiz-iq 'a string [of something]'
e'. tiz-im+lik 'a list'

The sets of words described above in (16c) and (16d) (and their respective examples, given below in (19) and (20)) appear to be regular, exceptionless,[14] and open-ended. I take them to be governed by

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14. Actually, there does appear to be one exception: ingliz 'English (nationality)' takes back harmonic suffixes despite containing the velar consonant /g/ and no non-neutralized vowels. Thus it does not fit the harmonic pattern of words with velars seen in (19). It partially resembles the pattern that we will see below in (25) in that it has a neutralized vowel in the final syllable that is underlyingly specified with features contrary to those of a nearby back consonant.

productive rules because these patterns are productively extended to loanwords from any source. When we looked at the partially underspecified back consonant G in (4e), we noted that its uvular variants occur in back harmonic environments, and velars in front environments. It can be no accident that the same correlations are found in (19) and (20). Yet there is no reason to believe that the back consonants in (19) and (20) are underspecified for the feature [High]. Instead, I believe that harmonic processes spread features to the underspecified consonant G in suffixes, whereas the correlation in the reverse direction from back consonants in roots to root vowels seen in (19) and (20) functions as a redundancy rule. Both vowels and consonants in these roots are underlyingly fully specified for backness and height. However, because Fronting applies to their vowels during derivations and neutralizes underlying features for backness, the back consonants are left with the major share of the responsibility for maintaining and conveying the underlying harmonic nature of these words.

(19) Velars /k, g/ signal [-Back] (=16c)

a.	kir-	enter!	- mAG	->	kirmäk	entering
b.	kiy-	wear!	- mAG	->	kiymäk	wearing
c.	kim+	who?	+ GA	->	kimgä	to/for whom?
d.	kir+	dirt	+ GA	->	kirgä	to/for dirt
e.	yik+	bobbin	+ lAr	->	yiklär	bobbins
f.	kigiz+	felt rug	+ lAr	->	kigizlär	felt rugs
g.	kiši+	person	+ lAr	->	kišilär	people
h.	gezit+	newspaper	+ GA	->	gezitkä	to/for a newspaper
i.	rentgen+	x-ray	+ GA	->	rentgengä	to/for an x-ray

The difference is that it is not paired with a supportive non-neutralized vowel in the first syllable sharing that same feature value.

Other stems of this class include: tik- 'sow!/sew!', kečik- 'be late!', čig- 'tie', igilik+ 'ownership', kičik+ 'small', tegišlik+ 'deserved', tik+ 'vertical', yenik+ 'light', kiyim+ 'clothes', kelin+ 'daughter-in-law', keyin+ 'after', tekist+ 'text' (< Ru.), igiz+ 'high', yilik+ 'marrow', ilgiri+ 'front', pikir+ 'opinion' (< Ar.).

(20) Uvulars /q, ğ/ signal [+Back] (=16d)

a.	čiq-	emerge!	- mAG	->	čiqmaq	emerging
b.	qil-	do!	- mAG	->	qilmaq	doing
c.	yiğ-	gather!	- mAG	->	yiğmaq	gathering
d.	yiğin+	meeting	+ lAr	->	yiğinlar	meetings
e.	beliq+	fish	+ lAr	->	beliqlar	fish (pl.)
f.	qeyiq+	boat	+ lAr	->	qeyiqlar	boats
g.	qiš+	winter	+ GA	->	qišqa	to/for winter
h.	eğiz+	mouth	+ GA	->	eğizğa	to/for a mouth
i.	qirğiz+	Kirghiz	+ GA	->	qirğizğa	to/for Kirghiz
j.	qisim+	part	+ lAr	->	qisimlar	parts

Other stems of this class include: tiq- 'insert', yiqil- 'fall down!', qizit- 'heat!', qiz+ 'girl', qiziq+ 'hot', qizil+ 'red', qelič+ 'sword', čiğ+ 'reed', qetim+ 'instance', qelin+ 'thick', qiyin+ 'difficult', eniq+ 'clear', eyiq+ 'bear', imliq+ 'interjection', issiq+ 'hot', ǰiq+ 'many', pišši̇q+ 'ripe', qiliq+ 'action', qiriq+ 'forty', seriq+ 'yellow', teriq+ 'millet', yeziq+ 'script' (< yaz- 'write!'), eğir+ 'heavy', qis+ 'short', qil+ 'loose hair'.

It might seem simpler to set up an alternative hypothesis whereby the vowels in (19) and (20) would not be underlyingly specified for backness, and instead backness harmony would be transmitted from the velar or uvular consonants directly to the suffixes. However, this hypothesis cannot be maintained because all examples of the type found

in (21) show that harmony is transmitted from vowels, and not from the back consonants. In (21) a., b., and c. the suffixes are harmonically back in agreement with the final vowels of the stems, despite intervening velar consonants, and in (21) d. through h. the suffixes are harmonically front, again in agreement with the final vowels of the stems, despite intervening uvular consonants.

(21) Stems with conflicting harmonic signals from vowels and consonants

a.	kawak+	hole	+I+GA	->	kawigiğa	to/for its hole
b.	čawak+	applause	+I+GA	->	čawigiğa	for its applause
c.	parašok+	powder	+I+GA	->	parašogiğa	for its powder
d.	šärq+	east	+I+GA	->	šärqigä	to its east
e.	xälq+	nation	+I+GA	->	xälqigä	for his nation
f.	mäšq+	exercise	+I+GA	->	mäšqigä	for his exercise
g.	äxmäq+	foolish	+l°G	->	äxmäqlik	foolishness
h.	mutläq+	absolute	+l°G	->	mutläqlik	absoluteness

Now finally we come to our largest and most interesting set of words, those which are described in (16e) and exemplified in (22). The roots of these words do not contain any of the back obstruents and their vowels are not exceptions to Fronting, so there is nothing on the surface to mark them as either front or back. To this extent they resemble the small group of words of the type seen in (17) that are lexically marked for front harmony. Yet this larger group of words in (22) contains all harmonically [+Back] words. Thus the tendency for words with neutralized vowels in Uyghur runs counter to that in Hungarian, and the predominant pattern is one that is unattested in either Khalkha Mongolian or Finnish. I therefore conclude that there is no necessary connection between the existence in a given language of a rule of absolute neutralization that produces a certain feature value

on the one hand, and the predominant or exclusive value for that feature in underlying representations on the other hand. [-Back] neutralization is not incompatible with underlying [+Back].

(22) Stems with no surface clues for backness (=16e)

a.	tizil-	line up!	- mAG	->	tizilmaq	lining up
b.	piš-	be cooked!	- mAG	->	pišmaq	being cooked
c.	tiriš-	strive!	- mAG	->	tirišmaq	striving
d.	eyt-	tell!	- mAG	->	eytmaq	telling
e.	siz-	draw!	- mAG	->	sizmaq	drawing
f.	til-	slice!	- mAG	->	tilmaq	slicing
g.	teyil-	skate!	- mAG	->	teyilmaq	skating
h.	til+	tongue	+ GA	->	tilğa	to/for a tongue
i.	yip+	thread	+ GA	->	yipqa	to/for thread
j.	xečir+	mule	+ GA	->	xečirğa	to/for a mule
k.	is+	smoke	+ GA	->	isqa	to/for smoke
l.	it+	dog	+ GA	->	itqa	to/for a dog
m.	deŋiz+	sea	+ GA	->	deŋizğa	to/for a sea
n.	siŋil+	younger sister	+ GA	->	siŋilğa	to/for a younger sister
o.	yešil+	green	+ 1°G	->	yešilliq	greenness
p.	yil+	year	+ GA	->	yilğa	to/for a year
q.	yerim+	half	+ GA	->	yerimğa	to/for half
r.	pit+	bug	+ GA	->	pitqa	to/for a bug
s.	sirt+	outside +I	+ GA	->	sirtiğa	to/for its outside
t.	etiz+	field	+ GA	->	etizğa	to/for a field
u.	miŋ+	thousand	+ GA	->	miŋğa	to/for 1000
v.	xil+	sort	+ GA	->	xilğa	to/for a sort
w.	zit+	against	+ 1°G	->	zitliq	opposition
x.	his+	feelings	+ GA	->	hisqa	to/for feelings
y.	isim+	name	+ GA	->	isimğa	to/for a name
z.	ǰin+	genie	+ GA	->	ǰinğa	to/for a genie
aa.	sinip+	class	+ GA	->	sinipqa	to/for a class
bb.	pe?il+	verb	+ GA	->	pe?ilğa	to/for a verb
cc.	še?ir+	poem	+ GA	->	še?irğa	to/for a poem
dd.	misir+	Egypt	+ GA	->	misirğa	to/for Egypt
ee.	dil+	heart	+ GA	->	dilğa	to/for a heart
ff.	sim+	wire	+ GA	->	simğa	to/for wire
gg.	mix+	nail	+ GA	->	mixqa	to/for a nail
hh.	čin+	true	+ 1°G	->	činliq	truth
ii.	sir+	paint	+ GA	->	sirğa	to/for paint
jj.	ǰiŋ+	500 gm.	+ GA	->	ǰiŋğa	to/for 500 grams
kk.	tip+	type	+ GA	->	tipqa	to/for a type
ll.	enžinir+	engineer	+ GA	->	enžinirğa	to/for an engineer

(22) Stems with no surface clues for backness (=16e) (continued)

(for some speakers, also:)

mm.	eriš-	get!	+ mAG	->	erišmaq	getting
nn.	beyǰiŋ+	Beijing	+ GA	->	beyǰiŋǧa	to/for Beijing[15]

As with (17), a number of additional stems in my database could be included in (22) because they contain only neutral vowels and take back harmonic suffixes, but I have omitted them because I consider them to be synchronically derived. Stems of this class include: ečil- 'open!' (< ač- 'open!'), yezil- 'be written!' (<yaz- 'write!'), čelin- 'ring!' (< čal- 'play [a musical instrument]'), elin- 'be taken!' (< al- 'take!'), meŋiš- 'go one after another!' (< maŋ- 'go!').

15. My informants differ on the harmonic nature of eriš- and beyǰiŋ. Speakers who assign them front harmony must list them with the stems in (17).

Chapter 5: Historical and Comparative Evidence

Thus far I have based my argument on Uyghur evidence, without bringing other Turkic languages into the discussion. In (23) I give the Uyghur examples with neutralized vowels that we have looked at in earlier example sets in a format that allows ready comparison both with Clauson's (1972) reconstructions for pre-thirteenth-century Turkic and with two modern Turkic languages that are geographically distant and typologically distinct from Uyghur, namely Turkish and Kazan Tatar.[16] It is clear that all of the examples in (17) and (19) are harmonically front in all of these languages, and the examples in (20) are harmonically back in all of these languages. However, the same consistency is not true of the examples in (22). The examples in (22) may be either front or back in early written Turkic and also in other modern Turkic languages (with these language sometimes in disagreement among themselves over whether a root is back or front), but the roots in (22) are consistently harmonically back in Uyghur. This is true both of native Turkic words, as in (22) a. through u., and of loanwords, as in (22) v. through nn.

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16. The Uyghur forms in this thesis are primarily from Tohti (1986/1987) and from personal communications with Litip Tohti, with some additional forms contributed by Hamit Zakir and Ablahat Ibrahim. The pre-thirteenth-century forms are cited from Clauson (1972) with his page numbers. Many of the Kazan Tatar examples are from Poppe (1968). The other Kazan Tatar examples and all Turkish examples are taken from various dictionaries.

(23) Inter-language comparisons of neutralized forms

	Uyghur		Clauson (1972)	Turkish	Kazan Tatar (ï = [ɤ])
(23.1) Neutralized roots from (11), (12), (14)					
d.	qiz+	girl	kɨ:z+ (679-80)	kɨz+	kïz+
h.	pikir+	opinion	(<Ar. fikr)	fikir+	fiker+
(23.2) Neutralized roots from (13)					
d.	tiq-	insert!	tik- (476-7)	tɨk-	tïk-
h.	tik-	sow!/sew!	"	dik-	tek-
(23.3) Roots from (17)					
a.	ič-	drink!	ič- (19)	ič-	eč-
b.	min-	ride!	bin- (348)[17]	bin-	men-
c.	bil-	know!	bil- (330-1)	bil-	bel-
d.	itti-	push!	it- (38)	it-	et-
e.	čiri-	decay!	iri:-/irü:- (198)	čürü-	čer-
f.	intil-	dedicate!	?	?	?
g.	ič+	interior	ič+ (17)	ič+	eč+
h.	biz+	we	biz+ (388)[17]	biz+	bez+
i.	siz+	you [polite sg.]	si:z+ (860)	siz+	sez+
j.	sili+	you [respected older person] (?reduced form of siz + lAr -> sizlär)			
k.	bir+	one	bi:r+ (353-4)	bir+	ber+

17. Proto-Altaic word-initial *m- regularly loses its nasality (> b) in Southwestern Turkic languages such as Turkish. In other branches of Turkic, it retains its nasality if supported by another nasal later in the word. (This is a sound change in some Athabaskan langauges also; Sharon Hargus, pc) Since Clauson's agenda includes denying a genetic relationship between Turkic and the other branches of the Altaic family, he consistently posits *b- where comparative evidence both within Turkic and from other branches of the Altaic languages points toward *m-. Any attempt to formulate a rule nasalizing *b- before a nasal will run into difficulties with the first person plural pronoun, which has the independent form biz+ and the suffixal form +ImIz+ in Uyghur. Other Turkic languages, including Turkish, have similar forms. Since there is no second nasal available to trigger nasalization, a nasalization rule seems untenable here. However, if denasalization occurred only word-initially, then suffixal forms would never meet its structural description, so the biz+/ +ImIz+ contrast is predicted.

(23) Inter-language comparisons of neutralized forms (continued)

(23.3) Roots from (17) (continued)

	Uyghur		Clauson (1972)	Turkish	Kazan Tatar
l.	tez+	fast	(?<tez- 'to run away, fly' (572))	tez+	tiz+
m.	šilim+	glue	yelim+ (?yélim+) (929)	?	?
n.	bilim+	knowledge	(< bil-)	bilgi+, biliš+	belem+
o.	ilim+	science	(<Ar. ʿilm)	ilim+	?
p.	ǰiddiy+	tense	(<Ar. ǰiddi:)	ǰiddî+	?
q.	imin+	Imin [m. name]	(?<Ar.)	?	?
r.	nispiy+	proportional	(<Ar. nisbi:)	nispi+	nisbi+
s.	filim+	movie	(<Ru. fil'm)	filim+	fil'm+ (=Ru.)
t.	retim+	rhythm	(<Ru. ritm)	ritim+	ritm+ (=Ru.)
u.	eriš-	get!	?	er-	ireš-
v.	beyǰiŋ+	Beijing	(<Ch. beyǰiŋ)	Pekin+	?

(23.4) Roots from (19)

a.	kir-	enter!	kir- (735-6)	gir-	ker-
b.	kiy-	wear!	ke:d- (700)	giy-	kiy-
c.	kim+	who?	kim+(?=kém+)(720-1)	kim+	kem+
d.	kir+	dirt	ki:r+ (735)	kir+	ker+
e.	yik+	bobbin	(y)i:k+ (99)	iğ+	?
f.	kigiz+	felt rug	kidiz+ (707)	keče+	kiyez+
g.	kiši+	person	kiši:+ (752-3)	kiši+	keše+
h.	gezit+	newspaper	(<Ru. gazeta)	gazete+	gazeta+ (=Ru.)
i.	rentgen+	x-ray	(<Ru. rentgen)	röntgen+	rentgen+ (=Ru.)

(23.5) Roots from (20)

a.	čiq-	emerge!	čɨk- (405-6)	čɨk-	čïk-
b.	qil-	do!	kɨl- (616)	kɨl-	kïl-
c.	yiğ-	gather!	yɨğ- (?yɨ:ğ-)(897)	yɨğ-	yïg-/yïk-
d.	yiğin+	meeting	yɨğɨn+ (904)	yɨğɨn+	ǰïyïn+
e.	beliq+	fish	balɨk+ (335)	balɨk+	balïk+
f.	qeyiq+	boat	kayɨk+ (676)	kayɨk+	kayïk+
g.	qiš+	winter	kɨš+ (670)	kɨš+	kïš+
h.	eğiz+	mouth	ağɨz+ (98)	ağɨz+	awïz+
i.	qirğiz+	Kirghiz	?	kɨrgɨz+	kïrgïz+
j.	qisim+	part	(<Ar. qism)	kɨsɨm+	?

(23) Inter-language comparisons of neutralized forms (continued)

(23.6) Roots from (22)

	Uyghur		Clauson (1972)	Turkish	Kazan Tatar
a.	tizil-	line up!	tizil- (575)	dizile-	tezel-
b.	piš-	be cooked!	orig. bɨš- later biš- (376-7)	piš-	peš-
c.	tiriš-	strive!	tireš- (554)	--	tïrïš-
d.	eyt-	tell!	ayɨt- (268-9)	öt-	äyt-
e.	siz-	draw!	?	?	?
f.	til-	slice!	til- (490-1)	dil-	tel-
g.	teyil-	skate!	tay- (?ta:y-) (567)	?	?
h.	til+	tongue	tɨl+ (489)	dil+	tel+
i.	yip+	thread	yɨp+ (870)	iplik+	ǰep+
j.	xečir+	mule	?	katɨr+	kačïr+
k.	is+	smoke	iš+ (254)	is+	is+
l.	it+	dog	ɨt+ (34)	it+	et+
m.	deŋiz+	sea	teŋiz+ (527)	deniz+	diŋgez+
n.	siŋil+	younger sister	siŋi:l+ (839)	?	seŋel+
o.	yešil+	green	yašɨl+ (?ya:šɨl+) (978)	yešil+	yašel+
p.	yil+	year	yɨl+ (917)	yɨl+	yïl+
q.	yerim+	half	yarɨm+ (968-9)	yarɨm+	yarïm+
r.	pit+	bug	bit+ (296)	bit+	bet+
s.	sirt+	outside	sɨrt+ (846)	sɨrt+	sïrt+
t.	etiz+	field	atɨz+ (73)	?	?
u.	miŋ+	thousand	bɨŋ+ (346-7)[17]	bin+	meŋ+
v.	xil+	sort	?	?	?
w.	zit+	against	?	zɨd+	?
x.	his+	feelings	(<Ar. ḥiss)	his+	xis+
y.	isim+	name	(<Ar. ?ism)	isim+	isem+
z.	ǰin+	genie	(<Ar. ǰin:)	ǰin+	?
aa.	sinip+	class	(<Ar. ṣinf)	sɨnɨf+	sïynïf+
bb.	pe?il+	verb	(<Ar. fiᶜl)	fiil+	figïl'+ (front voc.)
cc.	še?ir+	poem	(<Ar. šiᶜr)	šiir+	šigïr'+ (front voc.)
dd.	misir+	Egypt	(<Ar. miṣr)	Mɨsɨr+	Misïr+
ee.	dil+	heart	(<Pe. dil)	dil+	?
ff.	sim+	wire	(<Pe. si:m)	?	?
gg.	mix+	nail	(<Pe. mex)	mɨh+	?
hh.	čin+	true	čɨ:n+ (<Ch. chên) (424)	?	?
ii.	sir+	paint	sɨr+ (<Ch. ts'i̯ət) (842-3)	sɨr+	?
jj.	ǰiŋ+	500 gm.	(<Ch. ǰin)	--	?
kk.	tip+	type	(<Ru. tip)	tip+	tip+ (=Ru.)

(23) Inter-language comparisons of neutralized forms (continued)

(23.6) Roots from (22) (continued)

	Uyghur		Clauson (1972)	Turkish	Kazan Tatar
ll.	enžinir+	engineer	(<Ru. inžener)	--	inžener+ (=Ru.)
mm.	eriš-	get!	?	er-	ireš-
nn.	beyǰiŋ+	Beijing	(<Ch. beyǰiŋ)	Pekin+	?

I take the cross-linguistic consistency of phonological backness in the roots from (17), (19), and (20) and the cross-linguistic variability of backness in the roots from (22) that is apparent in (23) to be evidence that a productive default rule is operating in the Uyghur lexicon only on the forms in (22) to assign the value [+Back] to any stems that do not get assigned a value either lexically (=17) or by rule based on the presence of a [+Back] consonant (=19, 20) at an earlier stage in the lexicon. In (24) is a formulation of this rule.

(24) Backness Assignment (lexical default rule)

$$\emptyset \rightarrow [+\text{Back}] \,/\, \left[\begin{array}{l} \_\_\_\_\_ \\ +\text{High} \\ -\text{Round} \\ +\text{Syllabic} \end{array}\right]$$

I assume that the Elsewhere Condition (Kiparsky 1982:136) prevents this more general rule from applying to the small group of words in (17) that are lexically listed with the value [-Back]. The Elsewhere Condition also blocks any change of backness in the words in (19) and (20), where a redundancy rule assigns backness values to the vowels

based on the height of the back consonants. Obviously, all of these backness values in roots must be assigned in the lexicon prior to any harmonic spreading. The comparative evidence in (23) lends support to the argument that the words in (17), (19) and (20) have all maintained historic patterns, while the productive rule assigning [+Back] to the underlying representations of the words in (22) is a Uyghur innovation.