

A template for Turkish

Ann Denwood
ad10@soas.ac.uk

1. Introduction

The hypothesis that all words in Beijing Mandarin must conform to one of two interpretations of a four position template, which consists of two non-branching onset-nucleus pairs, was proposed by Goh (1996). This hypothesis was extended to Khalkha Mongolian (Denwood 1997). I now propose that Turkish can be analysed in a similar way. The differences between the three languages can be summed up in general as the result of different conditions and constraints on the interpretation of a four-position template, and in particular as the result of differences between constraints on initial 'stem' templates and constraints on non-initial 'suffix' templates¹.

A brief summary of the Chinese and Mongolian analyses is given in section 2, with particular emphasis on the difference between the two languages with respect to constraints and conditions on suffix templates. The analysis is extended to Turkish in section 3, outlining some of the consequences of using the template with respect to apparently word-final interpreted empty nuclei and consonant-zero alternation. The template has a role to play in the understanding of the relationship between morphology and vowel harmony as well as the assimilation of non-Turkic words into the language. I conclude in 4 that the template hypothesis can usefully be extended to Turkish, and that certain differences between Turkish, Mongolian and Chinese can be attributed to different conditions and restrictions on the interpretation of a suffix template.

2. Summary of Chinese and Mongolian conditions and constraints

A striking similarity between Chinese and Mongolian is that in both languages a minimal word is always either of the pattern (C)VC² or the pattern (C)V:, eg. Beijing Mandarin (BM) [pi:] 'pen' [kan] 'dry', Khalkha Mongolian (KhM) [su:] 'milk' [gal] 'fire'. The proposal is that such words occupy a basic template, and that any word longer than these occupies more than one template. It follows that if one template is combined with another template, one must be subordinate to the other unless the combination is of two independent morphological domains [[A][B]]³, therefore we expect to find greater restrictions on whichever template is the dependent one. We expect to find more substantive constraints on positions of a dependent template, and well as greater constraints on the interpretation of positions of a dependent template. First we look at the basic tool, the four-position template.

¹ The terms 'stem' and 'suffix' are used loosely throughout this paper to describe templates which have independent and dependent status respectively. It is not necessarily literally accurate.

² 'C' and 'V' informally represent interpreted onsets and nuclei. Initial (C) is optional.

³ The two kinds of morphology referred to in this paper are dependent analytic i.e. $\phi(\text{concat}(f(A), B))$ and independent analytic i.e. $\phi(\text{concat}(\phi(A), \phi(B)))$. Different kinds of morphology are discussed and defined by Kaye (1993).

2.1 The four-position template

The basic tool used in the analyses of BM and KhM is the four-position template consisting of two non-branching onset nucleus pairs. A constraint on the second onset nucleus pair of the template such that only the onset or the nucleus may be interpreted⁴ allows only two possible interpretations of the template, namely (C)V: or (C)VC, shown in (1). The claim (Goh 1996) is that N1 is head of the template, and that N2 is farther down the chain of licensing relationships⁵, and therefore unable to license melody in itself as well as in its onset. Besides this, the proposal⁶ (Denwood 1997b) is that N2 is parametrically p-licensed, but must be interpreted when O2 is empty in order to provide a proper governor for O2, fulfilling a condition on the template that one of the two positions of the second onset nucleus pair must be interpreted.

(1) The basic tool, the Chinese template

a.	O1	N1	O2	N2		b.	O1	N1	O2	N2
	x	x	x	x			x	x	x	x
		\		/						
	(C)	V			eg. [pi:] 'pen'		(C)	V	C	
										eg. [kan] 'dry'

As far as words consisting of a single template are concerned, in both BM and KhM the constraint on the interpretation of the second onset nucleus pair of the template is the same, meaning that a minimal word in both languages always conforms to one of the two patterns above, eg. BM [pi:] 'pen' [kan] 'dry', KhM [su:] 'milk' [gal] 'fire'. There is a difference between the two languages, however, in what happens when a template is not an independent stem template but a dependent suffix template. First let us look at Chinese suffix templates.

2.2 The Chinese 'suffix' template

Although Chinese is a language where there is comparatively little morphology, there are some contexts in BM where two templates combine to form words longer than four positions. For example the two independent words [t'ou] 'head' and [fa:] 'hair'

⁴ The Phonological ECP is defined by Kaye (1993) as follows:

A p-licensed (empty) category receives no phonetic interpretation

P-licensing:

1. Domain-final (empty) categories are p-licensed (parameterised)
2. Properly (empty) nuclei are p-licensed
3. A nucleus within an inter-onset domain is p-licensed

Proper Government:

α properly governs β if

1. α and β are not adjacent on the relevant projection
2. α is not itself licensed, and
3. no governing domain separates α from β .

Goh (1996) proposes the "P-licensing constraint for BM: if N2 is p-licensed, then O2 is not p-licensed". The same constraint applies to KhM.

⁵ Licensing Inheritance Principle, Harris (1992): A prosodically licensed position inherits its autosegmental potential from its licensor.

⁶ The proposal for KhM (Denwood 1997b) that N2 is lexically either empty or pseudo-empty, i.e. shares a single element with O2, could be extended to BM in order to explain why N2 sometimes has different content from N1, eg. BM [t'ou] 'head' and KhM [t'sai] 'tea'.

can combine to form a single word meaning 'hair'. When this happens, there are further restrictions on the second template which is subordinate to the first template. The second word loses its lexical tone, preventing it from occupying both onset nucleus pairs of its template, and forcing its content to be "squeezed" into a single onset nucleus pair. The example is illustrated in (2)⁷.

(2)	a.	O1	N1	O2	N2		b.	O1	N1	O2	N2
		[x	x	x	x]			[x	x	x	x]
									\		/
		t'	o		u			f		a	
	c.	O1	N1	O2	N2	O3	N3				
		[[x	x	x	x]	x	x]				
		t'	o		u	f	a				
										[t'oufa]	'hair'

The two independent words [t'ou] and [fa:] are shown in (2a) and (2b) respectively. In (2c), the second word combines analytically with the first word, but as a dependent. Loss of tone prevents the second word occupying more than two positions of the second template, with the result that the vowel shortens, and the two words combine as [t'oufa] *[t'oufa:] 'hair'. In short, the difference between stem and suffix templates in BM is that only one position of the second onset nucleus pair of a stem template may be interpreted, whilst neither position of the second onset nucleus pair of a suffix template may be interpreted. This difference could also be attributed to the greater licensing potential of N1 of a stem template than N1 of a suffix template. In other words, N1 of a stem template can license *either* O2 *or* N2 of its template to be interpreted, but not both, whilst N1 of a suffix template can license *neither* O2 *nor* N2 of its template to be interpreted.

Although the combination of templates in Chinese produces words longer than the four positions of the basic template, Chinese is not an agglutinative language like Mongolian where suffixes can be piled up onto a basic stem in order to create comparatively long words, phrases or sentences, eg. KhM [biçgege:r] 'by means of one's own writing' i.e. 'write' + nominaliser + possessive reflexive + instrumental suffixes. Historical evidence for the building up of all words from a stem template plus one or more suffix templates is beyond the scope of this paper. The present discussion is focussed upon how the template hypothesis can be applied to languages other than Chinese, and how parametric variation in constraints on suffix templates can explain some of the differences between languages. Now let us look at the KhM suffix template.

⁷ The tones are not illustrated here. The first word in the compound has 2nd tone and the second word has 3rd tone. According to Goh (1996), N1 of a template must be associated with a tone in order to be head of an independent domain. Without tone, any item occupying a template is unable to form a domain, therefore cannot fulfil the other condition on any item defined as a morphological domain in BM, namely that it must occupy both onset nucleus pairs of the template. Further examples of template combinations can be found in Goh (1996) Chapter 5.

2.3 The Mongolian suffix template

As already mentioned in 2.1, constraints and conditions on stem templates are the same in both BM and KhM, such that one and only one position of the second onset nucleus pair *must* be interpreted. Constraints on suffix templates in KhM are very different from those in BM, however.

Firstly, in KhM the same condition on stem templates that either O2 or N2 must be interpreted applies to suffix templates. Suffixes, like stems eg. [su:] 'milk' and [ger] 'house', always end either with a long vowel or a consonant, eg. the possessive reflexive suffix -a: (and its harmonic counterparts) or the verbalising suffix -əl. Secondly, a further point which can be seen from the two suffix examples just given is that a suffix-initial onset is empty. There appear to be substantive constraints on the content of a suffix template in KhM. I suggest that N1 of a suffix template, which has less licensing potential than N1 of a stem template, cannot license elemental content in O1 as well as in either O2 or N2. The addition of the possessive reflexive suffix -a: to the stem [gar] 'hand' and the verbalising suffix -əl⁸ to the noun stem [dər] 'like' are illustrated in (3a) and (3b) respectively.

- (3) a. O1 N1 O2 N2 O3 N3 O4 N4
 | | | | | | | |
 [[x x x x] (x) x x x]
 | | | \ /
 g a r a [gara:] 'hand (poss)'
- b. O1 N1 O2 N2 O3 N3 O4 N4
 | | | | | | | |
 [[x x x x] (x) x x x]
 | | | |
 d ə r l [dərəl] 'like (verb)'

In (3a) the noun [gar] occupies the stem template, whose final nucleus is parametrically p-licensed. The suffix -a: occupies N3 and N4, the two nuclei of the suffix template. O3, the suffix-initial onset, is empty. It is assumed in this example that O3 does not use its skeletal point, and that a p-licensed nucleus and adjacent pointless onset are reduced from the structure⁹. In (3b) the noun [dər] occupies the stem template, ending in a parametrically p-licensed nucleus. The suffix-initial O3 is empty, and as in the previous example is uninterpreted, presumably reduced from the structure. Although substantive constraints on unstressed suffix nuclei mean that suffix-initial N3 is empty, it must be interpreted as [ə] since the conditions for p-licensing are not met. The consonant [l] occupies O4, the second suffix onset, changing the noun stem into a verb to which more suffixes can be added.

⁸ The content of N1 of a suffix is uninterpretable unless it can be stressed. For a discussion on the relationship between stress and nuclear content in KhM, see Denwood (1997b). Evidence that unstressed nuclei are empty is that they are subject to the ECP when the conditions for proper government between nuclei and inter-onset government are satisfied.

⁹ Reduction (Gussmann & Kaye 1993): an empty nucleus followed by a pointless onset are removed from any phonological representation in which they occur.

There is one context where the initial onset of a suffix template is interpreted¹⁰. This is when a final long vowel is followed by a suffix-initial long vowel, i.e. when two nuclear sequences would otherwise be adjacent. In (4) the addition of the possessive -a: to the stem [dɔ:] 'song' is illustrated.

(4)	O1	N1	O2	N2	O3	N3	O4	N4	
	[[x	x	x	x]	x	x	x	x]	
		\		/		\		/	
	d		ɔ				a		[dɔ:ga:] 'song(poss)'

In (4) the noun [dɔ:] occupies the stem template. The suffix -a: occupies the second template. The suffix-initial onset is empty, and a long vowel occupies the two nuclear points. A constraint in KhM such that two nuclear sequences may not be adjacent forces the initial onset of the suffix, O3, to be interpreted as [g]. I suggest that the so-called 'epenthetic g' in KhM is in reality the interpretation of an empty onset, distinct from the lexical expression [g] found for example in the initial onset of a stem, eg. [ger] 'house'. Evidence that stem-initial [g] is not simply the interpretation of an empty onset is that stem-initial empty onset points need never be interpreted in KhM since N1 is always interpreted and therefore available to act as proper governor for O1, eg. [em] 'medicine', [us] 'hair', [av] 'take!' etc.. Suffix-initial [g] is particularly interesting when we extend the template hypothesis to Turkish, a language which like KhM belongs to the Altaic family. Let us see firstly what evidence there is for a four-position template in Turkish, and secondly what is to be gained by such an analysis.

3. Extending the hypothesis to Turkish

Since Turkish and Mongolian are both Altaic languages it is not surprising to find similarities between them. Nevertheless, at first sight any attempt to build up Turkish words by combining four-position Chinese style templates in the same way as proposed for KhM does not produce the right results for the simple reason that Turkish suffixes do not end in long vowels. On the other hand, the example of a 'suffix' template combined with a 'stem' template in BM [t'oufa] 'hair' given in (2) is more promising in that respect since Turkish suffixes frequently end in a short vowel, eg. [evde] 'at home'. The facts about Turkish words are now summarised.

3.1 The Turkish facts

Leaving out of the discussion for the present any words which are not of Turkic origin, we have to deal with the following facts about Turkish.

- (i) A minimal word or stem conforms to the same basic pattern as in both BM and KhM, (C)VC, eg. [bal] 'honey', or (C)V:¹¹, eg. [da:] 'mountain'.
- (ii) No suffix has a long vowel.

¹⁰ Evidence that dependent suffix-initial onsets are empty is discussed fully in Denwood (1997b). Suffixes such as the commitative -tai can be analysed as morphologically independent, with supporting evidence from restrictions on vowel harmony.

¹¹ Although the word [su] 'water' is a rare exception, historically it is thought to have been *suv* (Clauson (1962)). The final consonant survives in modern Kazak, Uzbek and Turkmen, whilst Yakut and Kirgiz have a final long vowel, *u:* and *su:* respectively. 'Defective' stems are discussed in 3.5.

- (iii) Suffixes follow the pattern either $-(C)VC$, eg. plural $-lar$, or $-(C)V$, eg. locative $-da$, dative $-a$ (and their harmonic counterparts).

As far as the minimal word is concerned, there is no problem. The similarity to KhM and BM is striking. The problem arises with suffixes, since we cannot say that the second onset nucleus pair of a dependent template can never be used (as in BM) when suffixes which use the second onset are frequently found, eg. the plural suffix $-lar/ler$ or the ablative $-dan/den$. It is unsatisfactory simply to say that suffixes of the pattern $-(C)V$ are dependent suffixes, whilst suffixes of the pattern $-(C)VC$ are independent, forming a domain of their own. I suggest that the answer to the problem lies in restrictions on the interpretation of a suffix template which are strict, but less rigid than in BM where the second onset nucleus pair is never used, and different from restrictions on a suffix template in KhM where one position of the second onset nucleus pair must always be used. I propose the following analysis.

3.2 The analysis

The analysis is based on three things:

- (i) Domain-final nuclei in Turkish are always empty.
- (ii) The parameter is fixed for domain-final p-licensing.
- (iii) There is only one context where a domain-final empty nucleus must be interpreted in order to satisfy the requirements of a minimal word: when O2 of a stem template is empty. N2 of a suffix is never interpreted.

First we consider word-final long vowels. A number of Turkish words have a final long vowel derived historically from lenition of a final consonant, eg. $[da:]$ 'mountain'. It is significant that such words fit a single four-position template¹². I suggest that the final nucleus in such words is interpreted in order to fulfil the requirements of a minimal stem template, providing a proper governor for the empty O2 whose historical final consonant is lost. This is shown in (5).

(5) a.				b.				O ← N p-licence	
O1	N1	O2	N2	O1	N1	O2	N2		
x	x	x	x	x	x	x	x		
							/		
d	a	(C)		d	a				$[da:]$ 'mountain'

In (5a) N2 is empty and parametrically p-licensed. O2 is also empty. In (5b) the content of N1 is interpreted in N2 providing a proper governor for O2, although N2 is empty and should be parametrically p-licensed. In this way the condition on a minimal stem is fulfilled.

¹² Such word-final long vowels are different from sequences of nuclei formed by addition of a suffix to a word-final short vowel, which will be discussed in 3.3. These are also different from words of borrowed origin which ended in a long vowel, but which may or may not be considered as long vowels in modern spoken Turkish eg. $[bina] \sim [bina:]$ 'building' from Arabic $[bina:]$?. These are discussed in 3.4.

Secondly we consider the fact that, as in BM, suffixes never end in a long vowel although they may end in a consonant, as they do in KhM¹³. I suggest that in Turkish there is no condition on a suffix such that it must occupy one of the positions of the second onset nucleus pair of the template. All final nuclei are empty and parametrically p-licensed. There is no need for a conflict between the ECP and conditions on the interpretation of a suffix template as in the case of a stem template because a suffix does not have to satisfy the same requirements as a stem. Because the conditions on a suffix are less rigid, the second onset may be interpreted if it has content, but if it is empty the content of N1 cannot spread to N2 in order to p-license O2. In this case the second onset nucleus pair of a suffix template may remain unused, as it is in BM. The ablative suffix -dan/den which has a final consonant can be contrasted with the dative suffix -da/de, which is never realised with a long vowel although it has no final consonant.

(6) a.	O1	N1	O2	N2	O3	N3	O4	N4	b.	O1	N1	O2	N2	O3	N3	O4	N4
	[[x	x	x	x]	x	x	x	x]		[[x	x	x	x]	x	x	x	x]
		e	v		d	e	n				e	v		d	e		
	[evden] 'from the house'									[evde] *[evde:] 'at home'							

In (6a) the noun [ev] occupies a stem template, and the ablative -den occupies a non-initial suffix template. O4 is filled and N4 is domain-final and parametrically p-licensed. In (6b) the suffix template is occupied by the locative -de. In this case the final onset as well as the final nucleus is empty. Since the content of N3 cannot spread to the parametrically p-licensed final N4, the last two positions of the suffix template remain unused. Whether or not they are reduced from the structure or simply unused is as yet unclear. It can be noted in passing that although both these suffixes have an initial consonant, a suffix may also have an empty initial onset eg. the dative -a/e. There appears to be no evidence for a constraint on the content of a suffix-initial onset as proposed for KhM¹⁴. Now let us see whether there are any useful consequences which arise from extending the template hypothesis to Turkish.

3.3 Consequences of using the template in Turkish

One outcome of using the four-position template analysis is that it provides an explanation for the interpretation of empty nuclei which appear to be final, and which therefore ought to be parametrically p-licensed. The case of stem-final empty nuclei which must be interpreted in order to fulfil the requirement of a minimal word has already been discussed, eg. [da:] *[da] 'mountain'. It remains to be explained why an apparently final empty nucleus in a word such as [sarl] 'yellow', [kedi] 'cat', [koyu]

¹³ According to Clauson (1962), in pre-13th century Turkish final short vowels were very rare after the 8th century and by the 11th century all final vowels were long, as in present day BM and KhM. These differences from modern Turkish could be explained by changes in conditions on templates.

¹⁴ According to the KhM analysis, a suffix like the Turkish -dan must consist of two separate suffixes, i.e. -d and -n respectively. Since a suffix-initial onset may be filled in the Turkish analysis, there is no need to make a similar proposal for modern Turkish, although according to Clauson (1962) the plural suffix -lar/ler contained a long vowel, i.e. -la:r/le:r, in the early form of Turkish spoken by the Karakhanids, in which case the final consonant would in those days have had to belong to a different template. For more details and supporting evidence for the KhM analysis, see Denwood (1997b).

'thick' etc. are not parametrically p-licensed. According to the template hypothesis, the answer is that such words are morphologically complex¹⁵. A more obvious case of morphological complexity is illustrated as an example. In (7) the accusative case (an interpretation of a word-final empty nucleus) is added to the stem [bal] 'honey'.

(7) a.	O1	N1	O2	N2	O3	N3	O4	N4		b.	O1	N1	O2	N3	
	[x	x	x	x]	(x)	x	x	x]		[x	x	x	x]
	b	a	l								b	a	l		

[balɨ] 'honey (acc)'

(7a) shows full stem and suffix templates. N2 is parametrically p-licensed. The initial onset of the suffix is empty and shown without using its onset point. The final onset of the suffix is also empty (possibly having lost a historical consonant). N3 is empty, but must be interpreted as head of the suffix template. N4 is domain-final, empty and parametrically p-licensed. It is one of the proposed conditions on suffix templates in Turkish that the domain-final nucleus can under no circumstances be interpreted. In (7b) N2 and O3 are reduced from the structure. Word-final O4 and N4 are also either reduced from the structure, or simply not used. Suffix-initial N3 is interpreted as [ɨ].

The analysis of final interpreted empty nuclei in Turkish as being followed by an uninterpreted onset and domain-final p-licensed nucleus has already been proposed by Kaye (1990: 318 - 320). The template hypothesis confirms Kaye's analysis, providing a reason for the existence of a final unused onset nucleus pair. The same structure can apply to all other word-final short vowels, eg. [oda] 'room', [sarɨ] 'yellow', [koyu] 'thick' etc.. It is possible that historically all such word-final short vowels were either followed by a final consonant, or were long, occupying both nuclei of a suffix template. There is certainly evidence for this hypothesis from related Turkic languages as well as from historical sources. For example Turkish [oda] is *otag* in Azerbaijani, *otaġ* in Turkmen and *ota:ġ* in pre-thirteenth century Turkish (Clauson 1972). Turkish [köprü] 'bridge' is *köprik* in Uzbek. Turkish [koyu] 'thick' is *koyuv* in Kazak, *koyuk* in Uygur and *koyu:* in Kirgiz, whilst Turkish [sarɨ] 'yellow', given by Clauson (1962) as *sarɨġ* in pre-eighth century Turkish, is *serik* in Uygur and *sërtk* in Uzbek.

A further variation on the interpretation of a suffix template has an interesting result, allowing us to explain the alternation of a word-final [k] with zero, eg. [ayak] 'foot' ~ [ayaa] 'foot(dat)'. This is a direct consequence of the restriction on non-initial templates, such that the final parametrically p-licensed nucleus can never be interpreted in order to properly govern a preceding empty onset. Let us suppose that in Turkish a suffix template whose second onset has no content can be realised in two different ways. The possibility that its final nucleus can be interpreted in order to p-license the empty onset, creating a final long vowel, is denied to it as a suffix and not a stem template. There are still two options. Either the second onset nucleus pair can

¹⁵ Arguments for historical morphology, pseudo-morphology and adapting loan words into Turkish-style templates will be very similar to those used for KhM in Denwood (1997b). Muratov (1975) discusses the kinds of change that may take place in a typical CVC root in Altaic languages.

(8) a.

	O1	N1	O2	N2	O3	N3	O4	N4
[[x	x	x	x	]	(x)	x	x	x]
		a	y			a		

b.

	O1	N1	O2	N3	O4	N4
[x	x	x	x	x	x	x]
		a	y	a		

[ayak] 'foot'

(9) a.

O1	N1	O2	N3	O4	N4	O5	N5	O6	N6
[[x	x	x	x	x	x]	(x)	x	x	x]
	a	y	a				a		

b.

				O	←	N	p-licence
	O1	N1	O2	N3	O4	N5	
[	x	x	x	x	x	x]
		a	y	a		a	

[ayaa] 'foot(dat)'

In (9a) the complex word [ayak] occupies an initial stem and suffix template followed by a further template occupied by the dative suffix. The initial onset of the dative suffix is empty, following the preceding domain-final p-licensed N4. O6 is empty. The dative suffix does not use the option of interpreting its second empty onset therefore the final onset nucleus pair remains unused and leaves N5, the initial nucleus of the dative suffix, as word-final. In (9b), after combination of the final template with the preceding suffix, N4 and O5 are reduced from the structure. O4, which was previously interpreted because N4 could not be interpreted in order to p-license it, now has N5 of the following suffix available as a p-licensor. Although we apparently have here a word-final pseudo long vowel, something which is impossible

according to the restrictions on suffix templates, this is in fact a sequence of two suffix-initial nuclei with independent content, rather than two nuclei of a single template which share the content of a suffix-initial nucleus.

Although, given the proposed restriction on suffix templates, 'long' vowels are possible only either when a stem-final nucleus is interpreted in order to fulfil the conditions of a minimal word, eg. [da:] 'mountain', or when two suffix-initial nuclei form a sequence as shown in (9) above, there is also the possibility that words enter the language from other languages where long vowels contrast with short vowels. For example, many such words came into Turkish long ago from Arabic, as well as from Persian and other languages. The question then is how such words conform to the restrictions of the four-position template and become assimilated into Turkish.

3.4 Non-Turkic words and the template

A great number of words which historically came into Turkish from Arabic (generally via Persian) contained long vowels in their original form. Even though these vowels may not have retained their length phonetically, the original length contrast is still reflected in their vowel quality. Arabic short [a] generally becomes Turkish [e] eg. [ders] 'lesson' (Arabic /dars/) except in the context of certain consonants such as [h], eg. [harf] *[herf] 'letter of the alphabet', whilst Arabic [a:] is always [a] but not *[e] in Turkish although the length distinction has nowadays mostly disappeared, eg. [kemal] (Arabic /kama:l/) 'perfection'.

The question of 'long' vowels in Turkish is a vexed one, since modern Turkish speakers do not all observe a length distinction which many speakers of the older generation were aware of, especially those who grew up reading and writing before the script was Romanised, since the long vowels in words of Arabic origin were differentiated from short vowels in the Arabic script which was adapted for writing Turkish. This distinction was still reflected in the Romanised spelling of certain words given in the second edition of Hony's *Turkish English Dictionary* (1957)¹⁶, where a circumflex denoted a 'long' vowel eg. /âli/ 'high' /ciddî/ 'seriously' /mahkûm/ 'condemned', although use of the circumflex was not always consistent and according to the 3rd edition (1992) "has been practically phased out". Hony also indicated theoretical if not always literal vowel length in brackets.

Let us assume for the moment that at least when such words entered the language, words that had long vowels in Arabic also had recognizably long vowels in Turkish, eg. [siya(:)si(:)] 'political', [bina(:)] 'building', [memnu(:)n] 'happy', [nüfu(:)s] ~ [nufu(:)s] 'population'. Given in the first place that when a foreign word enters a language there is some strategy not only for assimilating the word into a form recognizable to a native speaker, but also for incorporating the word into its own grammatical structures, these words can be divided into units based upon the four-position template in such a way that they can be recognized and parsed like native Turkish words. It then remains for the passage of time to smooth out any remaining details which appear to conflict with the pattern of a typical native Turkish word. Let us take, for example, the word [siya(:)si(:)] 'political', and try to analyse it into units which obey the Turkish restrictions on stem and suffix templates. Firstly, Turkish words are composed of a minimal four-position stem which must be interpreted either

¹⁶ Hony noted in his introduction that "Turkish spelling is still in a rather unsettled state". He also noted the difference in vowel quality between 'long' and 'short', although this too seems nowadays to have largely disappeared.

as (C)VC or (C)V: in order to satisfy the requirements of a stem template, to which may be added one or more suffixes. A constraint on suffix templates prevents the final nucleus from being interpreted, therefore suffixes never end in a long vowel. This means that a word like [siya(:)si(:)] must be analysed as being composed of three stem templates, in other words as three independent morphological domains [A] [B] and [C], i.e. [[siy][a:][si:]]. Compounds of independent Turkish stems are found which provide a precedent for this kind of compounding, e.g. [[ak][soy]], [[white][family]] i.e. 'noble'. A structure of stem plus two dependent suffixes [[[A]B]C], such as *[[[siy]a:]si:], would violate restrictions on the interpretation of suffix templates. One way that this word could be adapted to conform to a typical stem plus two suffix templates would be to shorten the non-initial long vowels, resulting in a word like [[[siy]a]si]¹⁷ 'political'. Let us take another example, [fela(:)ket] 'disaster'. This time, although the first two templates must be analysed as independent domains [fel] and [a:] (as long the vowel [a:] remains long), the third [ket] could be treated either as a stem or a suffix since suffix templates may have the final onset interpreted but not their final nucleus. By shortening the vowel [a:] the word takes on the appearance of a typical stem plus two suffixes [[[A]B]C] i.e. [felaket] 'disaster'.

Although by shortening non-initial vowels, a borrowed word may appear to conform to the structure of a typical Turkish word, the phenomenon of vowel harmony confirms the earlier analysis of such words as being composed of independent pseudo morphological domains rather than one independent domain followed by one or more dependent "suffixes". For example, even if after vowel shortening the word [felaket] 'disaster' can now be analysed structurally as [[[A]B]C], it still has three separate harmonic domains 'fel' 'a' and '-ket' (or possibly 'fel' 'ak' and '-ket'), and any additional suffix must belong to the same harmonic class as the third harmonic domain 'ket', eg. [felaketler] *[felaketlar] 'disasters'. Before looking at this apparent conflict between morphological structure and vowel harmony in more detail, the role of the template in understanding vowel harmony is discussed.

3.5 Harmony and the template

The idea that some nuclei depend on a nucleus that is head of the harmonic domain with respect to the nature of their content is the standard GP analysis of vowel harmony. Explaining the lack of vowel harmony within apparently morphologically simplex words as morphologically complex, or at least as having pseudo morphology, is not a new idea. The combination of four-position templates to build up complex morphological domains merely carries the idea forward. What the template hypothesis can give us is an explanation of harmony, or the lack of harmony, in terms of whether the morphology is dependently or independently analytic. This idea carries on from the description of nuclei as harmonically 'dependent' or 'independent' given in Denwood (1997a), where a dependent nucleus must have its content licensed by a harmonically independent nucleus. The template hypothesis supports an analysis of harmony where N1 of a morphologically independent stem template is also harmonically independent, and where the initial nucleus of a morphologically dependent suffix template is also harmonically dependent. It follows from the

¹⁷ This example is hypothetical, because although the [a:] may have shortened to [a], the final [si:] remains long in the modern language, unlike for example the final suffix -si in the word [kedis] 'cat (poss)'.

template hypothesis, and in particular from the proposed constraints on suffix templates in Turkish, that any 'long' vowel in Turkish must belong to a stem template and therefore be harmonically independent, and that any 'short' vowel which is not followed by a final consonant must belong to a suffix template and therefore be harmonically dependent. In other words, we do not expect to find a suffix of the pattern $-(C)V$ which does not harmonise with a preceding stem any more than we expect to find a stem template of the pattern $(C)V$: automatically harmonising with another stem template. The structural differences between the interpretation of a stem template and the interpretation of a suffix template, which are brought about by the different constraints on stem and suffix templates, act as a parsing cue. However, these differences are insufficient alone to enable all words to be parsed, since a stem and a suffix template may both be interpreted as $(C)VC$, eg. [ev] 'house' and [-ler] the plural suffix. Vowel harmony therefore acts as a back up parsing cue in the example [[ev]ler] *[[ev]lar] 'houses', telling us that the second template is a dependent suffix template since its vowel [e] is licensed by the head of the independent stem template.

According to what has been said so far, any non-initial vowel which does not harmonise with the preceding vowel of a word marks the beginning of a new harmonic domain, as well as of a new morphological or pseudo-morphological domain. In this case a non-initial non-harmonising vowel occupies a stem template, and as such should either be long, or at least historically have been long, or else it should be followed by a domain-final consonant, eg. [bina(:)] 'building', [zahmet] 'trouble'. Unfortunately, there are many words whose vowels do not harmonise with each other, and which cannot be separated into units each complying with the conditions on a stem template. Such words are frequently although not always from non-Turkic origins, eg. [kahve] ~ [ka:ve] 'coffee' i.e. [[kah][ve]]. In this case, if '-ve', the second part of the word [kahve], forms an independent pseudo-morphological domain it disregards the conditions on a stem template. It could be said that such words provide evidence against the template hypothesis. On the other hand, it could be said that the restrictions and conditions on stem templates have become less rigid with the passage of time and are also perhaps being speeded up by the entry of foreign words into the language.

There is evidence from true Turkic words that some stems may be defective, only using the first two onset nucleus pairs of the template. For example, the word [bugün] 'today' is a compound made up of two independent stems [[bu][gün]], i.e. [bu] 'this' and [gün] 'day'. Although the words [bu] 'this', [şu] 'that', [o] 'he/ she/ it' and [ne] 'what' occupy independent stem templates, their second onset nucleus pairs remain unused. Such words may be exceptional. They nevertheless provide a precedent for analysing non-initial nuclei whose content does not harmonise with the preceding nucleus, but which do not appear to belong to a well-formed stem template, as heads of independent pseudo-morphological domains, and therefore independent harmonic domains. In this way new words entering the language, eg. [bira] 'beer' or [kilo] 'kilo', can be analysed as consisting of independent but sometimes defective stems, i.e. [[bi][ra]] or [[ki][lo]] respectively. As in the case of true Turkish compound words, derivational or inflexional suffixes agree with the head of the last unit of the compound. For example, the complex word 'submarine' is composed of [deniz] 'sea' and [altı] 'bottom (poss)'. These two morphological and harmonic domains combine to form a single word [denizaltı] 'submarine', whose plural is

[denizaltılar] *[denizaltılar] 'submarines'. In a similar way suffixes must agree with the final domain of a pseudo-complex word, i.e. [biralār] *[biralār] 'beers' etc..

4. Conclusion

In this paper the template hypotheses previously proposed for Beijing Mandarin and Khalkha Mongolian have been extended and applied to Turkish. It has been claimed that the differences between the three languages can be explained by the difference in constraints and conditions on templates. The differences are summed up as follows. In all three languages the condition on stem templates is the same, such that one position of the second onset nucleus pair must be interpreted in addition to the initial nucleus of the template, therefore a minimal stem is realised as (C)VC or (C)V:. It is noted that whereas in BM and KhM this condition is always observed, in Turkish there is a certain amount of relaxation in this condition allowing some stem templates to be defective. Conditions on suffix templates vary considerably between the three languages. In BM only the first onset nucleus pair of a suffix template may be used. In KhM the initial onset of a suffix must be empty, whilst one position of the second onset nucleus pair must always be interpreted as in the case of a stem template. The constraint on Turkish suffix templates is that a final nucleus cannot be interpreted under any circumstances although a final onset may or may not be interpreted, therefore a suffix template may be realised as -(C)VC, as -(C)V but never as *(C)V:.

The template hypothesis enables us to explain the following phenomena in Turkish: firstly, the interpretation of apparently word-final empty nuclei although domain-final nuclei are p-licensed, and secondly, the alternation of final [k] with zero. The relationship between morphology and vowel harmony was also explored, leading to the proposal that independent stem templates are harmonically independent whereas morphologically dependent suffix templates are harmonically dependent.

References

- Alderson, A.P. with Fahir İz & Hony (1992) *Oxford Turkish English Dictionary (Third Edition)*, OUP.
- Clauson, Sir G. (1962) *Turkish and Mongolian Studies*. The Royal Asiatic Society of Great Britain and Ireland, Prize Publication Fund, Vol. XX.
- Clauson, Sir G. (1972) *An Etymological Dictionary of Pre-Thirteenth Century Turkish*, Oxford.
- Cobb, M. & Y. Jiang (1993) *SOAS Working Papers in Linguistics and Phonetics* 3.
- Denwood, M.A. (1997a) Harmony: Three for the price of one, in: Ploch, S. & D. Swinburne (1997): 193-207.
- Denwood, M.A. (1997b) *The Role of the Element I in Khalkha Mongolian Phonology*, PhD thesis, SOAS, University of London.
- Durand, J. & F. Katamba (1995): *Frontiers in phonology: Atoms, Structures, Derivations*. Harlow, Essex, Longman.
- Ercilasun, A.B. et. al. (1991) *Karşılaştırmalı Türk Lehçeleri Sözlüğü*, (Dictionary of Turkish Dialects), Kültür bakanlığı, Ankara.
- Goh, Y.S. (1996) *The Segmental Phonology of Beijing Mandarin*, PhD thesis, SOAS, University of London.

- Gussmann, E. & J. K. Kaye (1993) Polish notes from a Dubrovnik cafe. I. The yers, in: Cobb, M. & Y. Jiang (1993): 427-462.
- Harris, J. (1992) Licensing inheritance, *UCL Working Papers in Linguistics and Phonetics* 4: 359-406.
- Hony, H.C. with the advice of Fahir Iz (1957) *A Turkish English Dictionary (Second Edition)*, Oxford, Clarendon Press.
- Kaye, J.D. (1990) 'Coda' Licensing, *Phonology* 7.2: 301-330.
- Kaye, J.D. (1993) Derivations and Interfaces, in: Cobb, M. & Y. Jiang (1993): 90-126. Also in: Durand, J. & F. Katamba (1995): 289-332.
- Ligeti, L. (1975) *Researches in Altaic Languages*, Akademiai Kiada, Budapest.
- Muratov, S.N. (1975) Some regular changes of the phonetic structure of root in the Altaic languages, in: Ligeti, L. (1975): 173-179.
- Ploch, S. & D. Swinburne (1997) *SOAS Working Papers in Linguistics and Phonetics* 7.