

## Uyghur palatal harmony as bi-directional harmony

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**Abstract.** This paper discusses a small set of motion verb constructions in Uyghur and presents evidence from historical documents and modern written corpora showing that the constructions have undergone grammaticalization and univerbation. The paper presents an analysis of the resulting forms as consisting of a root plus a prefix that participates in vowel harmony, matching the root vowel in backness. Based on this analysis, it is argued that in terms of the cross-linguistic typology of vowel harmony, Uyghur palatal harmony can be said to be bi-directional.

**Keywords.** Uyghur; vowel harmony; language change; univerbation; typology

**1. Introduction.** Vowel harmony systems vary on a number of parameters, including the harmonizing feature, the direction of harmony, iterativity, and overall productivity of the process (see, e.g., Gordon & Fiddler 2024, Ritter & van der Hulst 2024,). Feature and directionality are most relevant to the present paper. Harmony systems involving backness, rounding, tongue root position, nasality, and a few other features are attested cross-linguistically. In some systems, the feature spreads to vowels later in the word (progressive or perseveratory); in others it spreads to earlier vowels (regressive or anticipatory), and in others it spreads in both directions based on either a dominant feature or a dominant morphological category, typically the root.

Like most Turkic languages, Uyghur has palatal (backness) harmony and labial (rounding) harmony, and it has an additional process of height harmony (referred to as *umlaut* in the literature) that is not common across the family. Table 1 shows the Uyghur vowel phonemes divided by backness, roundness, and height.

	front		back	
	unround	round	unround	round
high	ɪ	ʏ	(ʉ) <sup>1</sup>	u
low	e	ø		o
	ɛ		a	

Table 1. Uyghur vowel inventory

Example (1) illustrates palatal harmony in the infinitive suffix *-maq*, and (2) illustrates labial harmony in the gerund suffix *-(l)f*.

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<sup>1</sup> Scholars disagree on whether the historically distinct /ɪ/ and /ʉ/ remain contrastive or have fully merged (as the modern orthography would suggest). With respect to backness harmony, if other vowels are present earlier in the word, the high unrounded vowel is said to be transparent, i.e., suffixes will match the earlier vowel's backness. If there are no other vowels in the word, the presence of a front or back velar (k vs. q) determines the backness; if there are no velars, the backness is lexically specified. For the purposes of this paper, I use /ɪ/ throughout.

- |     |           |            |
|-----|-----------|------------|
| (1) | tut-maq   | kəl-mək    |
|     | hold-INF  | come-INF   |
|     | ‘to hold’ | ‘to come’  |
| (2) | bıl-ıf    | bəl-ıf     |
|     | know-GER  | divide-GER |
|     | ‘knowing’ | ‘dividing’ |

As for the umlaut process, Yakup (2009) describes a general assimilatory raising process that includes a “front-raising” process and a “back-raising” process. The front-raising process, which is described in the literature on Modern Standard Uyghur and also reflected in the standard orthography, is the one relevant to the forms discussed in the present paper. In this process, the low vowels /a, ɛ/ raise to [e] when they are in an open initial syllable and the vowel in the next syllable is /ɪ/.<sup>2</sup> This can be observed as a root-internal change, as in [belɪq] ‘fish’ (cf. Kazakh *baliq*), and as an active alternation, as in (3).

- |     |        |                      |
|-----|--------|----------------------|
| (3) | baɧ    | beɧ-ɪ                |
|     | head   | head-3POSS           |
|     | ‘head’ | ‘his/her/their head’ |

In terms of directionality, the palatal and labial harmony processes are progressive, while the height harmony/umlaut is anticipatory. The remainder of this paper will be devoted to an analysis of a recently developed set of forms that appear to display anticipatory palatal harmony, a heretofore unattested type of harmony in Uyghur.

**2. Prima facie case for a harmonizing prefix in Uyghur.** As in all Turkic languages, the morphology in Uyghur is almost exclusively suffixing. The few prefixes in Uyghur exist only on borrowed Persian words, e.g., the *bi-* in *bixeter* ‘safe’ (cf. *xeter* ‘danger’) or the *na-* in *namelum* ‘unknown’ (cf. *melum* ‘known’). None of these borrowed Persian prefixes participate in vowel harmony. However, a small set of motion verbs in Uyghur have derived forms that appear to have a harmonizing prefix. The forms are displayed in (4).

- |     |                   |                      |
|-----|-------------------|----------------------|
| (4) | Verb root         | Derived form         |
|     | bar- ‘go’         | apar- ‘take (away)’  |
|     | kəl- ‘come’       | əkəl- ‘bring’        |
|     | kət- ‘leave’      | əkət- ‘take away’    |
|     | tʃɯɧ- ‘go down’   | ɛtʃɯɧ- ‘take down’   |
|     | kır- ‘enter’      | əkır- ‘bring in’     |
|     | tʃɪq- ‘go up/out’ | atʃɪq- ‘take up/out’ |

In each of these cases, the initial vowel in the derived form matches the root vowel in backness. In the last two forms that have /ɪ/ as the root vowel, the backness is determined by the velar consonant; the *k* in *kır-* triggers front harmony (cf. *kır-gen* ‘enter-PST.PTCP’) while the *q* in *tʃɪq-* triggers back harmony (cf. *tʃɪq-qan* ‘go.out-PST.PTCP’). Looking at these simple synchronic facts, the obvious analysis is that there is a derivational prefix *A-* which converts intransitive motion

<sup>2</sup> Mayer et al. (2022) point out that /ɛ/ → [e] raising can also be triggered by /ɛ/ in suffixes, as in /kəl-ɛr/ → [kəl-ɛr] ‘come-AOR’ and note that this raises the question of whether it is really a height assimilation process. Sharma (2024) proposes that it might be better analyzed as a vowel reduction process. This issue certainly warrants attention, but to my knowledge it has not been addressed in detail elsewhere in the literature, and it will not be discussed in the present paper.

verbs to transitive verbs denoting a situation where a subject moves an object in the direction specified by the motion verb root. This prefix participates in palatal harmony, surfacing as either [a-] or [ɛ-] depending on the backness of the following vowel.

However, there is one additional motion verb in the set that does not fit the pattern: *qatf-* ‘flee, escape’ and *ɛpɣatf-* ‘steal, run off with.’ In this form, the initial vowel does not match the root vowel in backness, and there is an unexpected *p*. At this point, the synchronic analysis would have to treat this as an exception; to find an explanation for why this form is the way it is, it becomes necessary to examine the diachronic data to see where it came from.

**3. Diachronic origins.** These derived motion verbs come from the Chaghatay construction *alip* + *motion verb* (*MV*), as in *alip bar-*, *alip kel-*, etc. The word *alip* is the converb form of the verb *al-* ‘take (hold of), get.’ This construction still exists in Modern Uyghur as *elip* + *MV*, the first word having changed as a result of the umlaut process introduced above.

It is not clear how old the *alip* + *motion verb* construction is within the history of Turkic. None of the examples in Erdal’s (2004) grammar of Old Turkic appear to include this construction (*kälür-*, a causative form of *käl-* ‘come,’ is used for ‘bring’). However, *apar-* is found in at least Azerbaijani, Turkish, Siberian Turkic (Shor, Altai), and Kazakh, which suggests that *alip bar-* existed early in the history of Turkic, and may have even fused at a fairly early stage. (As fusion of auxiliary verb constructions has happened frequently across the whole family, though, it is also possible that the fusion took place independently, as long as the construction *alip bar-* was well-established before the languages diverged.) Fused versions of *alip kel-* can be found in other Turkic languages, including Kazakh /ækel-/ and Sakha /aʁal-/, and Menges (1955) reports *äkkäp*, a converb form of this verb, in South Siberian Turkic.

However old it may be, the construction presumably originated as a sequence of two clauses representing distinct events, as in ‘take (hold of something) and go’, ‘take (hold of something) and come’, and later grammaticalized into a single predicate. In Modern Uyghur, it combines syntactic properties of both original verbs, taking an accusative object representing the thing that is ostensibly taken hold of, and in some cases also a dative goal argument representing the direction or destination of the movement. Example (5) illustrates the use of this construction, with *bu qımmetlik materijallarnı* ‘these valuable materials’ as the object and *mjunxenka* ‘to Munich’ as the goal argument.

- (5) dolqun ejsa tyrkije-dın germanije-gε ket-ken-de  
 Dolqun Isa Türkiye-ABL Germany-DAT go-PST.PTCP-LOC
- bu qımmetlik materijal-lar-nı [...] mjunxen-ka el-ıp kel-i-du  
 this valuable material-PL-ACC Munich-DAT take-CVB come-PRES-3
- ‘When he comes to Germany from Türkiye [in 1994], Dolqun Isa brings these valuable materials with him.’ (Qutlan 2019)

It is important to note that *elip kelidu* here does not represent a series of two events, i.e., ‘takes these valuable materials’ and ‘comes to Munich.’ That would be expressed by dividing the sentence into two clauses: [*bu qımmetlik materijallarnı elip*] [*mjunxenka kelidu*]. Here *mjunxenka*, which would naturally be an argument of *kelidu*, appears before *elip*, which indicates that *elip kelidu* has grammaticalized to a single predicate.

Vandewalle (2018) discusses the cognate construction *olib* + *MV* in Uzbek, the closest relative of Uyghur. He shows that these constructions have undergone a considerable degree of grammaticalization, presenting evidence from a number of morphosyntactic tests to demonstrate

that the constructions represent a single syntactic predicate. For converb constructions representing two sequential or simultaneous events—which are thus analyzed as two separate clauses—it is usually possible to:

- 1) Replace the converb construction with a sequence of two finite verbs joined by a conjunction without changing the meaning;
- 2) Insert an element (e.g., an adverb) between the two verbs;
- 3) Insert a pause between the two verbs with an intonational boundary-marking pitch movement on the first verb, without changing the meaning;
- 4) Right-dislocate the first clause;
- 5) Apply negative, passive, or causative morphology freely to either verb.

For the *olib* + *MV* constructions, however, it is not possible to do any of these things without changing the meaning to a series of two events. Negative, passive, or causative morphology can be applied to the motion verb, but not to *olib*. (Causative forms of *olib* in these constructions were attested, but all speakers consulted said they were ungrammatical or at least questionable). It is possible for *olib* + *MV* to represent two separate events, as in ‘take (hold of something) and go,’ but that represents a different construction. This means that the construction has grammaticalized into a structure representing a single predicate. All of these characteristics are also true of the Uyghur constructions as well, so we can make the same conclusion for Uyghur.

It is also worth noting that at least some of the *elip* + *MV* constructions in Uyghur have undergone metaphorical extension and can be used to express abstract ideas as well as concrete motion events. For example, *elip kel-* is used in expressions such as *pajda elip kel-* ‘bring benefit,’ *xewp elip kel-* ‘bring danger,’ or *orun/medal elip kel-* ‘win a place/medal (in a competition).’ None of these expressions involves physically taking hold of an object or physically moving in a certain direction to transport the object somewhere. The core meanings of the constructions may still be grounded in physical motion events, but there has been plenty of extension to other semantic contexts.

The Uyghur forms presented in (4) above represent the outcome of phonetic reduction which resulted in the original two-word construction being fused into a single word. A considerable amount of phonetic material has been lost from the first verb in the construction; the only trace of it left in the modern forms is a single low vowel which matches the following vowel in backness. The form *epqatf-* ‘steal, run off with’ is obviously an exception to the vowel harmony, and it also preserves the *p* from the converb suffix *-(l)p* on *alip*.

The stages of development can be seen in the historical record. The changes for the converb forms *ekelip* ‘bring’ and *aperip* ‘take’ are summarized in (6).

(6)	Original form	<i>alip kelip</i>	<i>alip barip</i>
	Loss of intervocalic <i>l</i>	<i>ap kelip</i>	<i>ap barip</i>
	Fusion	<i>apkɛlip</i>	<i>apbarip</i>
	Voicing assimilation	---	<i>apparip</i>
	Raising/umlaut	<i>apkelip</i>	<i>apperip</i>
	Loss of <i>p</i>	<i>akelip</i>	<i>aperip</i>
	Harmonization	<i>ɛkelip</i>	---
	Modern form	<i>ɛkelip</i>	<i>aperip</i>

The loss of intervocalic *l* changing *alip* to *ap* is a broader change that affects the converb forms of certain *l*-final roots in fast speech, as in *qilip* ~ *qip*, *kelip* ~ *kep*, and even *ekelip* ~ *ekɛp*.

However, it is not an across-the-board change, as the forms with *l* are used in slower or more careful speech. The interaction between the umlaut and harmonization processes creates a case of counterfeeding opacity with respect to the form *apperip*. Once raising/umlaut applies, the [e] vowel in the second syllable is phonetically front, and we would expect harmonization to change the first vowel to [ɛ], yielding \**eperip*. However, the harmony value for umlauted forms is determined by the underlying vowel. The second vowel in *apperip* is underlyingly /a/, so it triggers back harmony.

Table 2 presents attested historical forms for the verbs *bar-* ‘go,’ *kəl-* ‘come,’ *tʃiq-* ‘go up/out,’ *kır-* ‘enter,’ *kət-* ‘leave,’ and *qatf-* ‘escape’ showing the development from the original two-word constructions to their present forms. The table shows the forms that I was able to find in the historical texts I consulted; the fact that certain cells in the table are empty simply means that I did not encounter the respective forms, not that they did not exist at that time. (For *etʃyf-* ‘bring down,’ I found only two tokens in the modern news corpora, both of which had front vowels in the first syllable.)<sup>3</sup>

Date	<i>bar-</i>	<i>kəl-</i>	<i>tʃuq-</i>	<i>kır-</i>	<i>kət-</i>	<i>qatf-</i>
Mid-18 <sup>th</sup> c.	<i>alıp bar-</i> <i>apar-</i>	<i>alıp kəl-</i>				
Mid-19 <sup>th</sup> c.			<i>alıp tʃiq-</i>			
1891-92	<i>apperip</i> <i>apparadu</i>	<i>apkelgen</i> <i>apkelip</i>	<i>aptʃiqar</i> <i>aptʃiqadu</i>	<i>apkırıp</i>		<i>apqafqan</i> <i>apqetʃip</i>
1956	<i>apparıdo</i> <i>apparedo</i> <i>apayanıken</i>	<i>akelgen</i> <i>akelip</i> <i>akılıdu</i> <i>ekılıp</i>	<i>aptʃiqıp</i> <i>atʃiqıp</i> <i>etʃiqqan</i>	<i>apkerıdo</i>	<i>akitidu</i> <i>ekitip</i>	
21 <sup>st</sup> c. news	<i>apar-</i>	<i>ekəl-</i> <i>epkəl-</i> (RFA1%)	<i>atʃiq-</i> (RFA93%) <i>etʃiq-</i> (UA65%)	<i>ekır-</i>	<i>eket-</i> <i>epket-</i> (1%)	<i>epqatf-</i>
21 <sup>st</sup> c. web	<i>apar-</i>	<i>ekəl-</i> (85%), <i>epkəl-</i> (11%) <i>akəl-</i> (2%) <i>ekkel-</i>	<i>etʃiq-</i> (43%) <i>atʃiq-</i> (36%) <i>eptʃiq-</i> (19%)	<i>ekır-</i> (84%) <i>akır-</i> <i>ekkır-</i> <i>epkır-</i>	<i>eket-</i> (80%) <i>epket-</i> (16%) <i>aket-</i> <i>apket-</i> <i>ekket-</i>	<i>epqatf-</i> (62%) <i>apqatf-</i> (38%)

Table 2. Historical forms showing development of derived motion verbs

While the forms in Table 2 show the stages of reduction of the original *alıp*, the motion verb roots remain essentially unchanged. This is worth pointing out because in Uyghur and other Turkic languages, it is typically the second verb in this type of construction that undergoes

<sup>3</sup> The mid-18<sup>th</sup> century and mid-19<sup>th</sup> century forms are from Schluessel’s (2018) Chaghatay reader. Forms from 1891-92 and 1956 are from the texts in the Uyghur Light Verbs Project (Dwyer et al. 2014). The 21<sup>st</sup> century forms are from corpora of news articles from the US-based *Radio Free Asia* and Kazakhstan-based *Uyghur Avazi*, and a corpus of archived posts from the Uyghur American Association web forum. In the rows representing pre-modern stages, the forms represent individual words attested once in the texts. For the modern corpora, I conducted searches for several possible spelling variants for each verb. Percentages are reported in parentheses where relevant to distinguish between common and sparsely attested variants.

grammaticalization and phonetic reduction. For example, the abilitative construction developed from a converb construction in which the second verb *al-* ‘take’ became an auxiliary indicating ability or possibility. The auxiliary eventually fused to the main verb and became a suffix which participates in palatal harmony, as shown in (7). This process has turned many different auxiliary verbs into suffixes in Uyghur (including the *-dur* in *aladur* here, which was formerly an auxuniliary derived from the lexical verb *tur-* ‘stand’).

(7)	Chaghatay		Modern Uyghur
	itf-ε	al-a-dur	itf-εlε-j-du
	drink-CVB	take-CVB-COP	drink-ABIL-PRES-3
	‘he/she/they can drink’ (Schluessel 2018: 95)		
	bar-a	al-a-dur	bar-ala-j-du
	go-CVB	take-CVB-COP	go-ABIL-PRES-3
	‘he/she/they can go		

Another point worth noting is that the original constructions are all still in use alongside the fused forms. That is, while *εkel-* is commonly used, *elip kel-* is still robustly attested in writing and in careful speech. This is demonstrated by a search of the three written corpora mentioned above. In the two news corpora, the non-fused constructions were used more frequently than the fused constructions, with the exception of *εpqatf-* in the *Uyghur Avazi* corpus. In the web forum corpus, on the other hand, the fused forms were used more frequently. The only exception was *εtʃf-*; it only had eight tokens in the entire forum corpus, all of which were non-fused.

This may provide an explanation for some of the variability in the data. Careful examination of Table 1 reveals that the pathway sketched out in (6) above is somewhat of a simplification. The earlier forms, while sparsely attested, do appear to show *alip* reducing to *ap-*, then *a-*, and then (for front roots) harmonizing to *ε-*. However, some of the later forms include a *p* before the root (*εpkel-*, *εptʃiq-*, *εpket-*), despite the *p* having been dropped in earlier forms, and some have a vowel that does not match the root vowel in backness (*akel-*, *atʃiq-*, *εtʃiq-*, *εpqatf-*). One possible explanation for these unexpected forms is that individual constructions may have undergone fusion multiple times, with different source forms. For example, the *p* seems to have dropped out of forms like *akel-* by the mid-20<sup>th</sup> century, but it appears again occasionally in 21<sup>st</sup>-century forms like *εkɪlɪp* from 1956 shows evidence of harmonization of the first vowel, loss of *p*, and umlaut of the second vowel, a form like *εpkel-* in the 21<sup>st</sup>-century web data represents a new fusion of the two-word construction in the modern language (*elip/εp kel-* > *εpkel-*).

Since *εp* is the shortened form of modern *elip* (after loss of intervocalic *l*), disharmonic forms like *ε(p)tʃiq-* and *εpqatf-*, which are indeed more frequent than the harmonic forms *atʃiq-* and *apqatf-*, could be recent formations based on *εp tʃiq-* and *εp qatf-*. If this is the case, it would lead us to a revised diachronic picture with two paths, as in (8). In the pathway starting from the mid-20<sup>th</sup> century, umlaut would already have applied to produce the starting form with *elip* instead of *alip*, and harmonization would not be part of the process.

(8)	Pathway 1 (starting from 19 <sup>th</sup> c.)		Pathway 2 (starting from mid-20 <sup>th</sup> c.)
Starting form	alɪp tʃɪq-	Starting form	elɪp tʃɪq-
Loss of l	ap tʃɪq-	Loss of l	ɛp tʃɪq-
Fusion	aptʃɪq-	Fusion	ɛptʃɪq-
Raising/umlaut	---	Loss of p	ɛtʃɪq-
Loss of p	atʃɪq-	Modern form	ɛtʃɪq-
Harmonization	---		
Modern form	atʃɪq-		

**4. Potential challenges for the analysis.** The analysis of *a-/ɛ-* in these verb forms as a harmonizing prefix involves two major contentions: first, that it is indeed a prefix, and second, that the alternation is indeed vowel harmony. These two questions will be addressed in more detail in this section.

4.1. IS IT REALLY A PREFIX? Univerbation, the process in which a two-word construction becomes a single word, is an extremely common process in the historical development of languages (e.g., Lehmann 2020, Haspelmath 2002, Anderson 2006).<sup>4</sup> Broadly speaking, univerbation is assumed to be the mechanism by which the vast majority of prefixes, suffixes, circumfixes, clitics, and compounds arise, though of course in many cases the actual source constructions are unknown.

When two words undergo univerbation, the end result can vary. In some cases, the two elements eventually merge into a single, unanalyzable new root. An example of this would be the English word *instead*: it began as a prepositional phrase *in + stead*, but as the word *stead* has dropped out of use, the average modern speaker knows it only as a monomorphemic root. In other cases, two words combine to form a compound, as in *blueberry*. The two parts are still recognizable to speakers, but *blueberry* is semantically and prosodically distinct from the phrase *blue berry*. Finally, one of the two elements can become an affix, a process which typically involves semantic shift to a more abstract or “grammatical” meaning as well as phonetic reduction and loss of prosodic independence. If it is the first of the two elements that undergoes this change, the result is a proclitic or prefix; if the second, the result is an enclitic or suffix. For example, the English derivational suffix *-less* as in *helpless* began as an Old English adjective *lēas* meaning ‘false,’ which could be combined with a preceding noun to indicate privative meaning. English contractions such as *n’t* for *not* or *’ll* for *will* are, in linguistic terms, enclitics: *not* and *will* have a shortened clitic form that is prosodically dependent on a neighboring pronoun or auxiliary.

For a form like *ɛkel-*, it is clear that there were two roots involved historically, *al-* ‘take’ and *kel-* ‘come’ (plus a converb suffix on the first verb). The question is, what is the best synchronic analysis of the structure of the word? These forms are discussed briefly in works by Uyghur scholars. Tömür (2003: 294) introduces the original two-word constructions and notes, “In the spoken language, some such combined verbs are reduced in sound and become a single unit.” Nazarova & Niyaz (2016: 258) refer to them as “verbal contractions.” These comments explain that the forms were derived via univerbation of two-word constructions, but they do not commit clearly to a particular morphological analysis. Following the possible outcomes of univerbation

<sup>4</sup> I use the term *univerbation* in its original and etymological meaning to simply indicate any time a sequence of two words becomes a single word. Some authors (e.g., Haspelmath 2002) restrict its meaning to word-formation processes resulting in compounds, preferring terms like *grammaticalization* and *coalescence* for processes that result in affixes, but others (e.g., Anderson 2006, various authors in Narrog & Heine 2011) use it more generally, as I do.

mentioned above, these forms could be seen as consisting of 1) a single root, 2) two roots, 3) a root plus a suffix (or enclitic), or 4) a prefix (or proclitic) plus a root. I discuss each option in turn below.

Analyzing *εkel-* as a single, unanalyzable root would be a way to account for the harmonization of the vowel without designating one or the other original component as an affix. A number of other Uyghur words that could be analyzed as monomorphemic were produced through similar historical processes. For example, *bygyn* ‘today’ came from *bu kyn* ‘this day,’ with the originally back first vowel undergoing anticipatory harmonization to the second vowel; and *seksen* ‘eighty’ came from *sekkiz on* ‘eight ten,’ with the originally back second vowel undergoing progressive harmonization to the first vowel. In terms of semantics, it seems plausible that ‘today’ and ‘eighty’ now represent unified concepts rather than just being shortened forms of the phrases ‘this day’ and ‘eight tens.’ *bygyn* and *seksen* each has its own entry in the authoritative Uyghur dictionary (Yakup et al. 1990), suggesting that speakers see them as fully lexicalized words.

Turning now to *εkel-*, one could argue that it represents a unified semantic concept of ‘bring’ rather than being composed of ‘take (hold of)’ + ‘come.’ This is consistent with the fact that the two-word construction had grammaticalized to be a single predicate, not a series of two clauses, as noted above. However, given that *elip kel-* and the other non-fused forms of these motion verb constructions are still productively used in formal writing and careful speech, it seems unlikely that speakers think of *εkel-* as an unanalyzable monomorphemic root and are not aware of its connection to *elip kel-*. And while *εkel-* does have its own entry in the Uyghur dictionary, there are many other verb forms that clearly include derivational morphology (e.g., causatives, passives) which also have entries in the dictionary. Each such entry notes the root and states what form of the verb it represents; similarly, for *εkel-*, the entry notes that it is a shortened form of *elip kel-*.

Analyzing *εkel-* as consisting of two roots—i.e., a compound verb—would be consistent with the historical origin in a two-verb construction, and it would make sense given the fact that the non-fused forms exist alongside the fused ones. In terms of semantics, one could argue that the meaning of *εkel-* is straightforward and compositional, simply meaning ‘take hold of (something) and come,’ and therefore amenable to analysis as a compound. However, as noted above, the two-word source construction is syntactically a single predicate that does not represent two separate events, and it can be used to express abstract meanings that do not involve physically taking hold of something or moving through space. Another weakness of a compound analysis is that it does not capture the asymmetry in which one of the roots is significantly reduced while the other one retains its full form. It also implies that the root *al-* ‘get, take’ has allomorphs *a-* and *ε-* which apparently alternate for palatal harmony. Palatal harmony historically applied within roots and sometimes applies during univerbation of words that end up becoming monomorphemic, as discussed above. Palatal harmony only applies obligatorily to affixes; it is not required for compounds—cf. *seksenput* ‘centipede’ (lit. ‘eighty-foot’), or *ot-tföp* ‘grass and weeds; fodder.’

Turning now to the two options that treat one of the elements as an affix, an analysis of *εkel-* as a root *ε* plus a clitic or suffix *-kel* can be dismissed easily. In other constructions, *kel-* has indeed become an auxiliary verb with aspectual meaning, but in this construction it does not have that function. Additionally, if one element had become an affix, we would expect that element to be the one that undergoes more phonetic reduction from its original form, and the other element,

i.e., the root, to retain more of its original form. In these forms, though, it is the first element that has reduced, not the second.

The final possible analysis is one that treats *ekel-* as consisting of a clitic or prefix *ε-* plus a verb root *kel*. This analysis is consistent with the asymmetry in terms of phonetic reduction, seeing the reduced element as an affix. In a language with a robust system of palatal harmony targeting affixes, it also seems ideal to analyze the element that alternates for backness as being an affix—although this would represent a novel development in that there are no other harmonizing prefixes in Uyghur.

A potential point of difficulty for this analysis is identifying a “grammatical” meaning for the prefix. By comparison, in the abilitative construction that turned into a harmonizing suffix (*ɾfɛ aladur* > *ɾfɛleɟdu* ‘he/she/they can drink,’ see (7) above), the second verb had clearly lost its lexical meaning and become a marker of an abstract modal category. Here again Vandewalle’s (2018) discussion of the cognate Uzbek constructions is insightful. Vandewalle argues that the first verb *olib* has, at least in some cases, lost its lexical meaning and functions as a causativizer. Example (9a-b) show that in some contexts *olib* + motion verb is equivalent to the causative form of the motion verb. Each sentence involves a person bringing an axe; (a) uses the *olib* + motion verb construction and (b) uses a causative. Although the causative form of motion verbs (e.g., *keltir-* in (9b)) does not always entail that the causer physically holds the causee and undergoes the motion along with the causee, and the types of causation that can be expressed by the two constructions do not fully overlap, in contexts like this there appears to be no difference in meaning between *olib kel-* and *keltir-*.

- (9) (Uzbek)
- a) Xotin-i bolta-ni ol-ip kel-ibdi  
 wife-POSS.3SG axe-ACC take-CVB come-PRF  
 ‘His wife brought the axe.’
- b) Bolta-ni kel-tir-Ø!  
 axe-ACC come-CAUS-IMP  
 ‘Bring the axe!’ (Vandewalle 2021: 40)

In (10), we see an *olib* + *MV* construction in a coordinate structure with a causative motion verb, with the two expressing antonymic meanings (‘import’ vs. ‘export’). Native speakers confirmed that there was no difference between the causative and the *olib* construction here.

- (10) (Uzbek)
- O’zbekiston Respublika-si hudud-i-ga ol-ib kir-il-adigan  
 Uzbekistan Republic-POSS.3SG border-POSS.3SG-DAT take-CVB enter-PASS-PTCP
- yoki u-ning hudud-i-dan chet-ga chiq-ar-il-adigan  
 or it-GEN border-POSS.3SG-ABL abroad-DAT exit-CAUS-PASS-PTCP
- ayrim tur-da-gi tovar-lar [...]  
 some kind-LOC-REL good-PL  
 ‘[...] some kinds of goods that are imported into the borders of the Republic of Uzbekistan or exported out of its borders [...].’ (Vandewalle 2021: 40-41)

Similar comparisons can be made for the Uyghur constructions. Example (11) comes from a *Radio Free Asia* article in which the reporter translates an interview clip with Labour Party

member David Bol discussing a movement in support of the Uyghurs with respect to the oppression they are suffering in China. The second line expresses the goal of the movement with a clause consisting of a dative argument *uyƣur xelqige* ‘to the Uyghur people’, an abstract (non-accusative-marked) object *mənpe’et* ‘benefit’, and a causative form of a motion verb *jetkizyƣ*. The third line restates or elaborates on the goal using a parallel clause. The structure of this clause is nearly identical to the previous one: a dative argument *Uyƣurlarƣa* ‘to the Uyghurs’ followed by an abstract object *erƣnlik* ‘freedom,’ but then an *alip* + motion verb construction where the previous line had a causative motion verb.

- (11) BİZ-niƣ məqsit-İMİZ [...] muƣu həriƣet-lır-İMİZ arqılıƣ [...]  
 1PL-GEN goal-1PL.POSS this movement-PL-1PL.POSS through  
 uyƣur xelq-ı-ƣe mənpe’et jet-kYZ-Yƣ,  
 Uyghur people-3POSS-DAT benefit arrive-CAUS-GER  
 uyƣur-lar-ƣa erƣnlik el-ıƣ kel-ıƣ.  
 Uyghur-PL-DAT freedom take-CVB come-GER

‘Our goal is for this movement of ours to bring benefit to the Uyghur people, to bring freedom to the Uyghurs.’ (Oyghan 2019)

Again, this is not to say that the *alip* + motion verb construction is completely identical to causative motion verb constructions, but there is a good degree of similarity and in certain context the meaning is more or less equivalent. Here both *jetkizyƣ* and *elip kelıƣ* have entirely abstract meanings. Neither the object nor the causee is undergoing any physical motion, which removes one of the potential contrasts between the original concrete meanings of the two constructions. *alip* ‘take (hold of)’ clearly does not have any concrete meaning, which means the semantics of *elip kelıƣ* cannot be understood as simply ‘take (hold of) and come.’

Finally, Vandewalle presents the following example as evidence that the Uzbek *ol-* has grammaticalized to the point of losing its lexical meaning in certain contexts:

- (12) (Uzbek)  
 to’p-ni traktor bilan tort-ıb ol-ıb chiq-ısh kerak  
 ball-ACC tractor with pull-CVB take-CVB exit-GER necessary  
 ‘It is necessary to pull the ball [out of the goal] with a tractor’ (Vandewalle 2021: 42)

The crucial point here is that a converb clause can express events that happen prior to or simultaneous with the following clause, but not an event that happens after the event in the following clause. In (12), the converb clause *traktor bilan tortıb* ‘pulling with a tractor’ expresses the manner or means by which the action of removing the ball is accomplished; in terms of temporal sequence, this is simultaneous with the action described by *olıb chiqısh*. However, logically speaking one must take hold of a ball and then pull it. If *olıb* here simply had its lexical meaning ‘take (hold of),’ that event would have to take place before the event expressed by *tortıb* ‘pull’ and would therefore have to occur earlier in the sentence than *tortıb*. The fact that it does not indicates that *olıb* here functions only as a causativizer for the following verb *chiqısh* ‘exit,’ not as a lexical verb meaning ‘take.’ This eliminates the problem with temporal sequencing: if *olıb chiqısh* simply means ‘cause to come out’ or ‘remove,’ not ‘take and go out,’ then the pulling with the tractor appearing before it does not violate the principles governing the use of converb clauses.

Vandewalle concludes that in contexts like this, *olib* has grammaticalized into a causativizer, and that its reduced form *ob-* in the unverbated forms is best analyzed as a proclitic or prefix. I believe the same reasoning holds for Uyghur. As the unverbated forms exist alongside the two-word constructions, it would be natural to analyze the reduced form of *elip* as a proclitic. In Uyghur, though, vowel harmony only applies to true affixes, not to clitics (Hahn 1991). The harmonization of the vowel indicates that it is fully integrated into the word, so the best analysis is to call it a derivational prefix.

4.2. IS IT REALLY HARMONY? In the derived verbs presented in (4) above, we see a pattern in which the first vowel (representing a reduced form of *alip*) matches the root vowel in backness. This section argues that this was indeed a process motivated by harmonization, not a coincidence of other factors that produced a harmony-like outcome.

From the attested historical forms in Table 1, we can see that by 1891-92 *alip* had been reduced to *ap* and the constructions had undergone univertation with the first vowel invariably [a]. We see *apparadu* and *apqasqan* where the second vowel is back, but also *apkelip* and *apkiriip* where the second vowel is front but the first vowel is still [a]. The vowel in the first syllable changed later, after univertation, and crucially the change happened only in the forms whose second vowel was front, with the result that the first vowel matched the second vowel in backness.

Comparative evidence also makes this clear. In Uzbek, the closest relative of Uyghur, the system of palatal harmony has decayed and is no longer present in most varieties. The Uzbek vowel inventory is considerably smaller than what existed in Chaghatay, with several harmonic pairs having merged (Nikulín 2024). In modern Uzbek, the *olib* + motion verb constructions discussed above have also undergone univertation: *obor-*, *obkel-*, *obket-*, *obkir-*, *obchiq-*, and *obqach-* (in Uzbek orthography, from Vandewalle 2021). In these forms, the first vowel is invariably *o* (IPA /ɔ/, reflecting Chaghatay /a/), with no alternation between front and back variants depending on the vowel in the following syllable. This confirms that the historical forms all had a back vowel in the first syllable, but in Uyghur the first vowel harmonized later to match the following vowel.

Cognate forms elsewhere in the Turkic family show hints of harmony, but not systematic evidence for it. Kazakh has [ækel-] ‘bring,’ but the first vowel [æ] is not the front counterpart of [a]. A form alternating for palatal harmony would be [\*ekel-], which does not exist. On the other hand, the fact that the original [a] vowel has fronted to [æ] suggests at least coarticulation, even if the form does not conform to the harmony system of Kazakh; otherwise we would expect [\*akel-]. In Sakha, on the other hand, the form [aʌal-] from *alip kel-* suggests that progressive (not anticipatory) harmonization has taken place, with backness spreading from the initial [a]. However, the fact that harmony patterns (or lack thereof) related to specific forms are different in different languages across the family is not problematic.

Returning to Uzbek for a moment, it is worth noting that the Uyghur umlaut process also did not happen in Uzbek. Is it possible, then that the supposedly harmonized Uyghur forms beginning with *ε-* are actually just a result of umlaut having changed *alip/ap* to *elip/εp* before the constructions fused? This seems unlikely. Table 1 includes forms like *apqetfip* and *apkelip* in the 1891-92 Uyghur data, in which the forms are fused but the first syllable still has *ap*, not *εp*. We do see umlaut affecting the first vowel in the motion verb roots (cf. *qatf-* ‘escape’ and *kel-* ‘come’); this is presumably by analogy/extension from the unprefixated forms of these verbs, since the umlaut process typically only targets vowels in word-initial syllables.

As mentioned above, though, the umlaut process may account for the recent forms of *atfiq-* *etfiq-* ‘take up’ and *epqatf-* ‘steal’ that do not follow the harmony pattern. The root *qatf-* ‘escape’ has a back vowel, and the derived form is attested twice in the 1891-92 texts with a back vowel in the first syllable (*apqafqan* and *apqetfiq*). While a significant portion of the tokens from the forum posts use the spelling *apqatf-*, both news corpora consistently spell it as *epqatf-*, and this is the form listed in the dictionary. As for *etfiq-/atfiq-* ‘take up,’ the dictionary spells it *atfiq-*, and this is the standard followed by most *Radio Free Asia* newswriters, but *Uyghur Avazi* newswriters use *etfiq-* with a front vowel in the first syllable about two thirds of the time, and the web forum posts share a similar preference for the front vowel. This suggests that *atfiq-* is the conservative form, and speakers have shifted to *etfiq-* more recently. As proposed above in (8), it is possible that since the unfused *alip* + *motion verb* constructions have persisted alongside the fused versions, univerbation may have occurred again for some of the verbs after umlaut changed *alip/ap* to *elip/ep*.

*Apar-* does not seem to have been affected at all by the umlaut (i.e., no forms like \**epar* or \**epbar-* were attested), and *ekel-* is also quite stable, with *epkel-* occurring only occasionally. These two are far and away the most frequent of the constructions, so the earlier forms are very well entrenched. In the corpora of news articles and forum posts, there were 2464 tokens of *apar-* plus 10360 of non-fused *elip bar-* (12824 total) and 1709 of *ekel-* plus 5233 non-fused (6942 total), but just 296 of *atfiq-/etfiq-* plus 1157 non-fused (1426 total) and 90 of *epqatf-* plus 111 non-fused (201 total). It could be that the fused and harmonized forms of *atfiq-* and *apqatf-*, which were attested historically, were simply not very well entrenched, and when the non-fused constructions changed to *ep tfiq-* and *ep qatf-*, speakers ended up using these for the fused forms.

If contemporary speakers appear to be settled on *epqatf-* and shifting toward *etfiq-*, it would be possible adopt a synchronic analysis that takes invariant *ε-* as the main form of the prefix, and treats *apar-* as a lexical exception, *epqatf-* as having an idiosyncratic *p*, and *atfiq-* as an older variant that is on its way out. Certainly if *apar-* ever develops forms with a front vowel in the first syllable, it would be clear that speakers have generalized the prefix to *ε-*. At present, there is enough variation in the contemporary forms that either my harmonic prefix analysis or an invariant *ε-* analysis will have multiple exceptions. It is clear that harmonization happened historically; at this point, I still have a preference for the synchronic analysis that reflects that diachronic process, but others may find the *ε-* analysis appealing.

**5. Discussion: the diachrony of harmony.** If one accepts the analysis of these forms as having a prefix that participates in palatal harmony, the implication in terms of vowel harmony typology is that Uyghur palatal harmony is bi-directional. In forms like *ε-kel-mek* ‘PREFIX-come-INF’ and *a-par-maq* ‘PREFIX-come-INF,’ the front vowel in the root determines the backness of both the vowel in the prefix and the vowel in the suffix.

One interesting aspect of this historical change is that it represents an example of how vowel harmony can extend in a language that already has harmony. The historical record shows that a similar process happened in the emergence of the abilitative suffix mentioned earlier. As discussed above, the abilitative construction comprised forms like *itʃe aladur* ‘he/she/they can drink’ in Chaghatay, with front vowels in the root but a back vowel in the auxiliary *al-*. This construction underwent univerbation and harmonization, such that in the modern form the formerly back vowels from the auxiliary now alternate for palatal harmony, as in *itʃelejdu*, with front vowels in the suffix to match the front vowel /i/ in the root.

The abilitative construction underwent univerbation by at least the late 19<sup>th</sup> century, with forms like *sal-al-ma-sa* throw-ABIL-NEG-COND ‘if they are not able to throw’ attested in 1891

(“The Mäjlis game of Turfan”, in Dwyer et al. 2014). Grammatical descriptions from the early 20<sup>th</sup> century explicitly state that the suffix did not alternate for palatal harmony: “Note that the vowel of *al-* is constant and remains unaffected by Phonetic Rules” (Whitaker 1909: 13), and “This affix remains intact, never changing phonetically” (Raquette, 1913: 68). However, a text from 1905 contains the form *køter-el-me-j* carry-ABIL-NEG-PRES ‘they are not able to carry’ (“A Description of Garments,” in Dwyer et al. 2014), in which the abilitative suffix has a front vowel to match the front vowel in the root. If grammatical descriptions state that the suffix did not alternate, but attested forms show that it did, the most likely reality is that the suffix was beginning to alternate around this time. Perhaps some speakers treated it as harmonic and others did not, or perhaps it alternated on some verbs but not on others. In any case, it eventually became a fully harmonic suffix that alternates predictably for backness in the modern language. As time goes on, we may see the newly emerging prefix *A-* become a fully harmonic affix as well, with *epqatf-* and *etfiq-/atfiq-* eventually settling into the expected patterns. Alternatively, we may see the *ε-* forms prevail, in which case the bi-directional harmony was a short-lived phenomenon.

Finally, this prefix *A-* is admittedly not a very productive prefix, and therefore the anticipatory palatal harmony cannot be said to be a very active process in Uyghur. The abilitative and other suffixes governed by palatal harmony in Uyghur are extremely productive; they can be added to practically any verb, and their surface form is always predictable from the backness of the final stem vowel preceding the suffix. It is worth noting, though, that there is little to nothing in the literature about how the two-word abilitative construction developed in the first place, i.e., how and when a sequence of *V + al-* ‘take’ came to express ability, or about how the univerbation took place. It is possible that the abilitative interpretation was initially associated with particular lexical items at a considerably earlier stage and then extended gradually across the lexicon, and that univerbation targeted certain forms first and then spread. This would be a question for further study.

Grammaticalization is always a gradual process. At this point, the prefix *A-* only appears on the set of motion verbs that appeared (and still appear) in the original *elip + MV* construction. In some instances, it seems equivalent to the causative form, but in other instances it is not. However, future developments could see this construction (and therefore the anticipatory palatal harmony) extend further. There are other motion verbs like *øt-* ‘pass’, *jyr-* ‘go’, *qajt-* ‘return’, *jet-* ‘arrive’, *maq-* ‘walk’, *jgyr-* ‘run’, and *utf-* ‘fly’ that could be candidates for this construction but, to my knowledge, do not participate in it. And there are certainly biclausal structures with *alip* as the first verb and some other verb as the second that could potentially turn into monoclausal constructions. In the future, it will be interesting to see if the construction and harmony process extends to any of these other domains.

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