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Non-uniformity in phonologizing phase heads: Evidence from Kazakh

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Abstract. Typical of a Turkic language, vowel harmony regularly occurs in Kazakh. In this paper, I address the exceptional behavior of the comitative marker in Kazakh regarding palatal harmony, and show that it follows from the K head being phonologized separately from its complement. This is crucial following work on Cophonologies by Phase (CBP), in which phase heads are claimed to be phonologized with their complements (see Sande & Jenks 2018, Sande 2019, Sande et al. 2020, Felice 2022). I argue that CBP can account for the exceptional behavior of the comitative marker by modifying the existing proposal. Specifically, it can model the exceptionality of the comitative marker if it is assumed that some heads (specifically the K head in the case of Kazakh), are phonologized separately from their complements (cf. Newell 2008).

Keywords. morphophonology; palatal harmony; case; cophonologies by phase; Kazakh

1. Introduction. Kazakh is a Turkic language from the Kipchak branch. Typical of a Turkic language, vowel harmony regularly occurs in Kazakh, and most of its affixes undergo this process. For the sake of this paper, only palatal harmony will be discussed. Palatal harmony in Kazakh is demonstrated in (1) where the accusative suffix surfaces as a [+back] vowel in (1a-b), where it follows a root with [+back] vowel(s); but surfaces with a [-back] vowel in (1c-d), where it follows a root that has [-back] vowel(s).

(1) Kazakh palatal harmony: Accusative marker (McCollum 2018a: 78)
- a. qɔːs-tə ‘hut-ACC’
- b. taːs-tə ‘stone-ACC’
- c. ies-tɛ ‘memory-ACC’
- d. tɵːs-tɛ ‘chest-ACC’

Additionally, palatal harmony in Kazakh is iterative. This is demonstrated in (2), where both the plural marker and the accusative marker’s vowels harmonize for backness in accordance with the root vowel(s).

(2) Iterative Kazakh palatal harmony: root + PL +ACC
- a. ɔːquwʃə-laːr-də ‘student-PL-ACC’
- b. kʏsʏk-lier-dɛ ‘puppy-PL-ACC’

Interestingly, the comitative marker (also referred to as the instrumental marker) in Kazakh does not participate in palatal harmony, as is demonstrated in (3) where the comitative vowel is invariant and surfaces as [-back] whether the last vowel in the root is [+back] as in (3a) or [-back] as in (3b).

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(3) Nonharmonic Kazakh comitative
   a. aːdaːm-mien ‘person-COM’
   b. bɵːpie-mien ‘baby-COM’

In Kazakh, nonharmonic elements are typically limited to borrowed elements and clitics (Muhamedowa 2016: 281). I argue that the comitative is neither a clitic nor a borrowed element. Furthermore, I demonstrate that the vowel in the comitative regularly alternates for backness in other morphemes. I ultimately argue that the comitative is one of six case markers (as in Balakaev 1962). This presents an interesting puzzle, because the other five case markers partake in vowel harmony. To account for this puzzle, I adopt a Cophonologies by Phase (CBP) model (see, e.g., Sande & Jenks 2018, Sande 2019, Sande et al. 2020). In doing so, Kazakh presents an interesting contribution to CBP. Namely, regarding the fact that CBP analyses have previously phonologized all phase heads with their complements. However, I argue that under a CBP-style analysis, the K head in Kazakh must be phonologized separately from its complement in order to account for palatal harmony within the case paradigm.

The paper is structured as follows. §2 discusses the status of the comitative marker in Kazakh, categorizing it as a case marker. §3 provides a brief overview of cophonologies by phase (CBP), focusing on the claim that phase heads are phonologized with their complements under this approach. §4 models the case paradigm via CBP as it has been presented in the literature, demonstrating that phonologizing the K head in Kazakh with its complement fails to capture the paradigm. An adjusted version of CBP is then applied, successfully capturing the paradigm. Concluding remarks are provided in §5.

2. The invariant comitative marker. As was demonstrated in (3), in the previous section, the comitative marker in Kazakh does not partake in palatal harmony. Typically in Kazakh, nonharmonic elements are limited to loan words and/or clitics. In what follows, I demonstrate that the Kazakh comitative marker is neither.

2.1. NONHARMONIC LOAN WORDS AND THE COMITATIVE MARKER. Kazakh has a number of loan words from Persian, Arabic, English, Chinese, Russian, among other languages (see (4) for some examples).

(4) Example of loan words in Kazakh (Muhamedowa, 2016: 175-181)

a.	pensijanï	‘pension’	Russian origin
b.	deposijttik	‘depositary’	English origin
c.	adebijet	‘literature’	Arabic/Persian origin

As Muhamedowa (2016: 281) highlights, loan words “may remain nonharmonic”. For example, derivational affixes borrowed from Arabic and Persian often serve as exceptions to the [±back] alternations in Kazakh. This is demonstrated with two derivational affixes in (5).

(5) Nonharmonic loan affixes in Kazakh (adapted from Muhamedowa 2016: 281)

a.	b.	c.
ɵːner-paːz	bæːle-qɔːr	saːz-ger
art-PAZ	trouble-QOR	music-GER
‘art lover’	‘evil man’	‘composer’

In (5a-b), despite the roots containing [-back] vowels, the derivational suffixes surface as [+back]. Likewise, in (5c), despite the root containing a [+back] vowel, the derivational suffix surfaces as [-back].

The fact that many loan words and affixes are nonharmonic begs the question, is the comitative marker in Kazakh a loan suffix? First, none of the literature on Kazakh, including descriptive grammars refer to the comitative as a loan suffix (see, e.g. Muhamedowa 2016, Balakaev 1962, McCollum 2018a). Additionally, turning to Qaraqalpaq, another Turkic language from the Kipchak branch, a very similar form is used as the comitative marker (see (6)). It is also worth noting that Wurm (1951) makes no suggestion that the comitative in Qaraqalpaq is borrowed either.

(6) Qaraqalpaq comitative marker (Wurm 1951: 564)
   a. bĭrɛu̯dĭŋ qarɣʲsĭ **menin** 'Through somebody's curse'
   b. parʲšasï **mnen**... 'With the help of…'

The bolded comitative marker in (6) is phonologically similar to the Kazakh comitative marker. For this reason, in addition to the fact that no literature suggests it is a loan suffix, I assume that the comitative marker in Kazakh is not a loan suffix.

2.2. THE COMITATIVE AS A CASE MARKER. In addition to loan words, Kazakh clitics are also sometimes nonharmonic. This is demonstrated in (7) with the joy/regret clitic *-aw* and the speculative question clitic *-še*.

(7) Nonharmonic Kazakh Clitics
   a. žettim-**aw**
      reach.PST.1SG-**CL**
      'Hurrah, I've reached it.'
      (Muhamedowa 2016: 15)
   b. bir bala asïrap alsaq **še**
      one child adopt.CONV AUX.COND.1PL **CL**
      'And what if we adopt a child?'
      (Muhamedowa 2016: 19)

In (7a), the joy/regret clitic surfaces with a [+back] vowel despite the word it leans on having [-back] vowels. Similarly, the speculative question clitic in (7b) surfaces as [-back] despite the word it leans on having [+back] vowels.

For this reason, it is crucial to address whether the comitative is some sort of postpositional clitic. I argue that it is not a postpositional clitic on the basis of several patterns it exhibits that are closely related to the other five overtly marked cases.

First, in terms of word order, the comitative marker surfaces in the same position as the other five overtly marked cases. In (8), the dative marker, the accusative marker, and the comitative marker all follow the plural and possessive markers.

(8) PL + POSS + DAT/ACC/COM
   a. ɔː-laːr ɵːz-**dier-ɛ-nie** kɵːmiek-ties-tɛ
      3-PL self-**PL-POSS-DAT** help-PST-3SG
      'They helped themselves'
   b. ɵːz-**dier-ɛ-n** – ɵːz-dier-ɛ [ʒaːqse kɵːrie]-dɛ
      self-**PL-POSS-ACC** – self-PL-POSS like-3SG
      'They like themselves'

c. mien bəːpie-**lier-i-m-mien** bʏrgie-mʏn
I baby-**PL-POSS-1SG-COM** be-1SG
'I am with my babies'

Furthermore, Kazakh, typical of a Turkic language and other agglutinative languages (i.e. Japanese and Korean), demonstrates suspended affixation (see, e.g., Lewis 1967, Kornfilt 1996, Kabak 2005, Broadwell 2008, etc). In Turkic, even plurals allow suspended affixation, but I will focus primarily on case markers. This is demonstrated with the accusative, ablative, dative, and genitive in (9), (10), and (11). In (9), the case markers can surface on both nouns in a coordinate NP structure. Whereas, in (10), the case markers only surface on the rightmost noun. In (11), the leftmost noun cannot bare case alone, resulting in unattested sentences.

(9) Case markers surface on both nouns in a coordinate NP
a. mien aːlmaː-**nə** ʒienie aːpielsɛm-**gɛ** ʒiedʏm
I apple-**ACC** and orange-**ACC** eat.PST
'I ate an apple and an orange'
b. aːidaːnaː it-**tien** ʒienie məsəq-**taːn** qaːʃtə
aːidaːnaː dog-**ABL** and cat-**ABL** run.PST
'Aidana ran away from the dog and the cat'
c. aːidaːnaː it-**kie** ʒienie məsəq-**qə** aːlmaː bierdʏ
aidana dog-**DAT** and cat-**DAT** apple give.PST
'Aidana the dog and cat an apple'
d. mien aːidaːnaː-**nəŋ** ʒienie aːidos-**təŋ** ʏj-ʏn ənaːidəmən
I aidana-**GEN** and aidos-**GEN** house-3SG.POSS like
'I like Aidana and Aidos' house'

(10) Case markers surfaces on the right-most noun in a coordinate NP
a. mien aːlmaː ʒienie aːpielsɛm-**gɛ** ʒiedʏm
I apple and orange-**ACC** eat.PST
'I ate an apple and an orange'
b. aːidaːnaː it ʒienie məsəq-**taːn** qaːʃtə
aːidaːnaː dog and cat-**ABL** run.PST
'Aidana ran away from the dog and the cat'
c. aːidaːnaː it ʒienie məsəq-**qə** aːlmaː bierdʏ
aidana dog and cat-**DAT** apple give.PST
'Aidana the dog and cat an apple'
d. mien aːidaːnaː ʒienie aːidos-**təŋ** ʏj-ʏn ənaːidəmən
I aidana and aidos-**GEN** house-3SG.POSS like
'I like Aidana and Aidos' house'

(11) Case markers cannot surface solely on the left-most noun in a coordinate NP
a. *mien aːlmaː-**nə** ʒienie aːpielsɛm ʒiedʏm
b. *aːidaːnaː it-**tien** ʒienie məsəq qaːʃtə
c. *aːidaːnaː it-**kie** ʒienie məsəq aːlmaː bierdʏ
d. *mien aːidaːnaː-**nəŋ** ʒienie aːidos ʏj-ʏn ənaːidəmən

The comitative marker patterns the same. In (12), the comitative surfaces on both nouns of the coordinate NP structure. In (13), it surfaces on the right-most noun only. In (14), the comitative cannot surface only on the left-most noun.

(12) mien a:ida:na:-**mien** ʒienie a:idos-**pien** biergiemʏn[1]
I aidana-**COM** and aidos-**COM** be.PRES.together
'I am with Aidana and Aidos'

(13) mien a:ida:na: ʒienie a:idos-**pien** biergiemʏn
I aidana and aidos-**COM** be.PRES.together
'I am with Aidana and Aidos'

(14) *mien a:ida:na:-**mien** ʒienie a:idos biergiemʏn

Distributionally, the comitative marker appears to pattern similarly to the five case markers.

Additionally, in Kazakh, stress falls on the final syllable of a phonological word (Muhamedowa 2016: 285). For example, in (15), stress falls on the final syllable of *bala.* Then, when the plural suffix is added, stress shifts to the vowel in the plural suffix (16).

(15) ba:l**á**:
'child'

(16) ba:la:-l**á**:r
child-PL
'children'

Turning to the case markers, stress shifts from the root to the case markers. In Figure 1, *aidana* bears stress on the final syllable. When the genitive marker is suffixed to the root, stress shifts to the vowel in the genitive marker (Figure 2). Likewise, when the accusative marker is suffixed to the root, stress shifts to the vowel in the accusative marker (Figure 3).

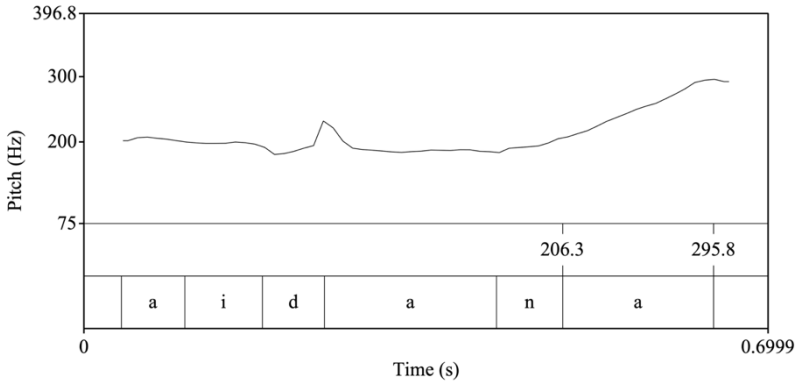


Figure 1: Final syllable of the root bearing stress

[1] Note that the onset of the Kazakh comitative undergoes voicing assimilation, thus alternations -mien/-pien.

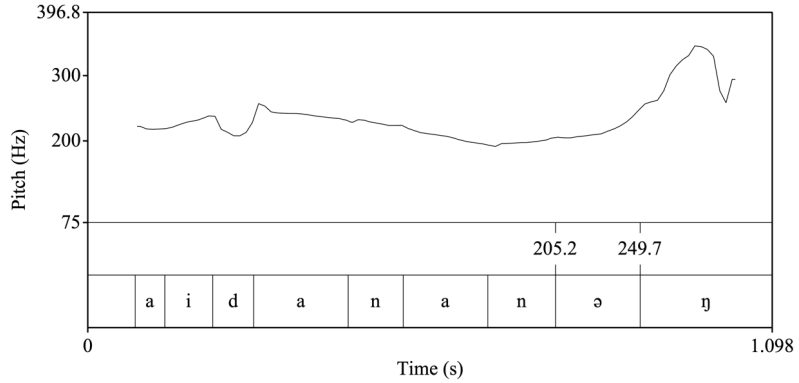


Figure 2. Genitive marker bearing stress

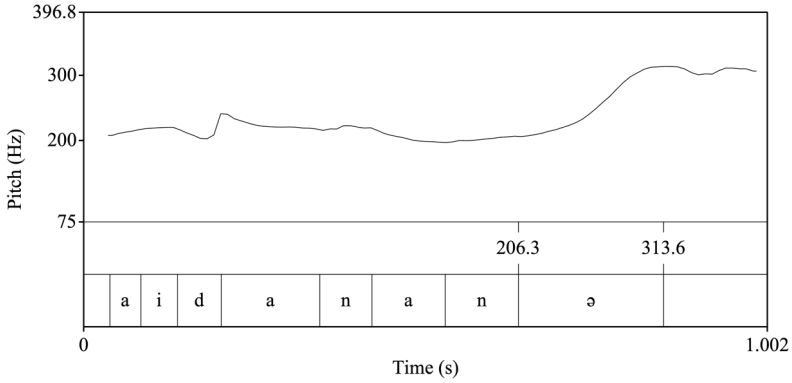


Figure 3. Accusative marker bearing stress

Similar to the genitive and accusative examples, stress shifts to the comitative marker when it surfaces on the root, *aidana* (Figure 4)[2].

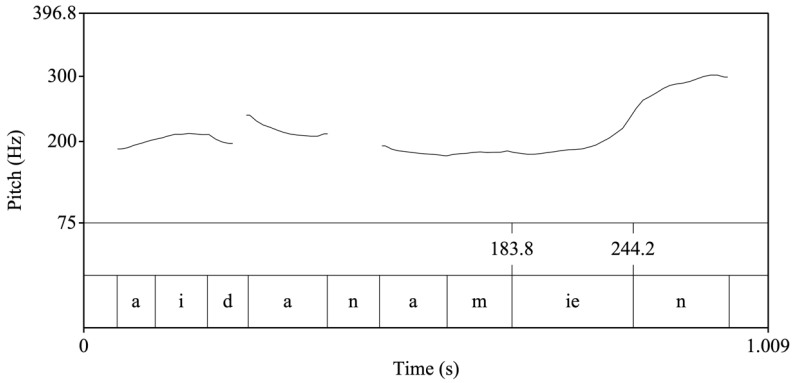


Figure 4. Comitative marker bearing stress

[2] Compare with the post-positional comitative in Turkish, which does not bear stress even when it is word final (see Kornfilt 1997: 222).

Following the distributional similarities of the comitative with case markers, I argue that the comitative is one of six case markers and not a post-positional clitic.

Assuming the comitative is one of six case markers and can partake in some phonological interactions with the noun (stress) presents an interesting puzzle: How is it that the comitative does not partake in palatal harmony, while the other case markers do? In §4, I seek to answer this question using Cophonologies by Phase (CBP). Before, I turn to the analysis, in §3, a brief overview of CBP is provided.

2.3. THE COMITATIVE VOWEL. In analyzing the comitative as one of six cases, it is also important to examine whether the vowel in the comitative marker is simply non-alternating. This, however, is not the case. As McCollum (2018) highlights, the comitative vowel is present in several other morphemes in Kazakh, and regularly participates as both a target and undergoer of vowel harmony. In the plural marker, the vowel alternates to harmonize for backness, as is demonstrated in (17).

(17) Plural suffix -LAr alternations

a.	qala-lar	'city-PL'
b.	ɔːquwʃə-lar	'student-PL'
c.	bɵːpie-lier	'baby-PL'
d.	bˑːlɛʃ-tier	'cake-PL'

Therefore, I argue the non-harmonic behavior of the comitative is not due to featural specifications of the vowel.

3. Cophonologies by phase: An overview. CBP, as introduced by Sande & Jenks (2018), is a model of the morphology-phonology interface. Under this model, it is assumed that morphology and phonology are interpreted via the hierarchical output of syntax. These output forms are evaluated by a constraint-based phonological component (Sande 2019).

CBP also assumes distributed morphology (DM), thus insertion of vocabulary items takes place late in the derivation at PF. As a model, CBP relies on three main components: Phase-based spell-out, enhanced vocabulary items, and constraint reweighting (Sande 2019). In what follows, a brief description of the main components of CBP are provided. For a more in depth description of the model the reader may turn to Sande & Jenks (2018), Sande (2019), and Sande et al. (2020).

3.1. PHASE-BASED SPELL-OUT. While CBP is closely related to Cophonology Theory (Orgun, 1996, Anttila 2002, Inkelas & Zoll 2007), one of the main distinctions from its relative is the incorporation of syntactic phases as the domain for phonologization. Following Chomsky (2000, 2001), CBP assumes phases are syntactic constituents that are sent to spell-out.

Following previous work on phases (i.e. Chomsky 2000, 2001, Marvin 2002), CBP (as described in Sande 2019) assumes heads such as Voice, C, and D are phase heads. Additionally, CBP assumes that categorizing heads, such as *n*, *v*, and *a* are phase heads (Arad 2003, Embick 2010). Under such an approach, phase heads trigger spell-out. Crucially, under CBP, phase heads are spelled out with their complements (cf. Bošković 2016). This assumption differs from traditional views of syntactic phases, in which the head triggers spell-out, but is itself spelled out in a higher phase (i.e. Chomsky 2000, 2001).

Following traditional phase theory, under CBP, phases are held to the Phase Impenetrability Condition (PIC) (i.e. Chomsky 2000). It is assumed that morphological and phonological

operations are also cyclic and aligned with phases. This is crucial in deriving opacity and domain-bounded effects (Sande 2019).

Phase spell-outs, under this approach, consist of an optimal phonological sequence. After spell-out, internal morphosyntactic hierarchical structure of a given phase is lost, and the phase forms a single moveable or copiable unit. Previous phases, in the derivation, are susceptible to phonological manipulation at phases higher in the structure (contra D'Alessandro & Scheer 2015).

CBP, as a spell-out-by-phase system, eliminates the need for phonology-specific domains that are not referenced elsewhere in the grammar (i.e. Stratal OT (Bermúdez-Otero 1999, Kiparsky 2000, 2008) and optimal domains theory (Cole & Kisseberth 1994)). In CBP, phase boundaries are components of both the syntax and phonology, removing any need for a phonology-specific domain (Sande 2019).

3.2. ENHANCED VOCABULARY ITEMS & CONSTRAINT INTERACTIONS. As was previously indicated, CBP assumes DM. However, Sande & Jenks (2018) and following literature on CBP highlight an important addition to DM-style vocabulary items. Under CBP, it is assumed that vocabulary items associate morphosyntactic features with three phonological components: An underlying phonological representation ($\mathcal{F}$), a prosodic subcategorization frame ($\mathcal{P}$), and, most importantly, a reweighting of phonological constraints ($\mathcal{R}$) (Sande 2019).

The underlying representation ($\mathcal{F}$), may consist of a segmental or suprasegmental representation. Alternatively, like the other phonological components, it can be null. The prosodic subcategorization frame ($\mathcal{P}$) determines whether $\mathcal{F}$ is a free-standing prosodic word, attaches to elements, etc. It also determines the direction of attachment for elements that are bound morphemes. The reweighting[3] of constraints component ($\mathcal{R}$) is one of the key innovative components of CBP. It is an extension of work on cophonology theory (see, e.g., Orgun1996, Anttila 2002, Inkelas & Zoll 2005, 2007). Crucially, only under phases in which a vocabulary item is associated with a contentful $\mathcal{R}$ will there be a reweighting of constraints. If all vocabulary items within a phase have null $\mathcal{R}$s, then the default weighting of constraints will be applied.

As in Sande (2019), enhanced vocabulary items will be expressed as extended DM-style vocabulary items (as in (18)).

(18) [Syntactic features] $\leftrightarrow \left\{ \begin{array}{l} \mathcal{F}\text{: (Supra)segmental content.} \\ \mathcal{P}\text{: Prosodic subcategorization.} \\ \mathcal{R}\text{: Constraint reweighting: B}(+3) \end{array} \right\}$

(Sande 2019: 462)

As was previously mentioned, any of the three components in (18) may be null. In (18), since $\mathcal{R}$ is associated with a constraint reweighting, it interacts with the default weighting of constraints for the language. However, phonology does not take place at vocabulary insertion. Instead, it takes place at the phase boundary. Thus, the $\mathcal{R}$s of all vocabulary items within a phase will interact simultaneously with the default weighting. Put more simply, reweightings take scope over spell-out domains (in the case of Sande 2019, this is the entire phase). If no other vocabulary items within the same phase as the vocabulary item in (18) are associated with a contentful $\mathcal{R}$, that entire phase will be spelled out based on the constraint reweighting in (18).

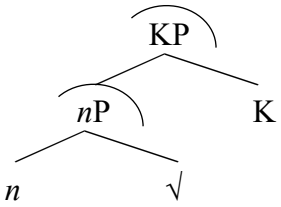
[3] Note that Sande & Jenks (2018) utilize constraint rerankings. Either approach works for this paper. However, to maintain consistency with the most recent literature on CBP, reweightings will be used in the analysis. The constraint weights are arbitrarily set to account of the constraint ranking in the grammar.

For example, let us assume the default weighting of concerned constraints for a given language is A = 2, B = 1, and C = 3. The constraint weighting for the phase in which (18) is spelled out will then become A = 2, B = 4, C = 3. Crucially, the reweightings of constraints cannot affect phonological evaluation of material outside the domain (Sande 2019).

4. CBP & the Kazakh case paradigm. In this section, the Kazakh case paradigm, with a focus on the nonharmonic comitative marker, will be modelled via CBP. I argue that in order for CBP to model the case paradigm, certain changes must be made. Specifically, I argue that some phase heads are interpreted with their complements while others are not (cf. Newell 2008).

4.1. NOMINAL STRUCTURE. Case markers have been argued to project KP in the nominal phrase (see Takahashi 2011 for Japanese, Bošković 2014, and Franks 2020 for Slavic). For Kazakh, I assume that case markers (including the comitative marker) are realizations of a K head. Additionally, I assume *n*P and KP to be a phases, as is demonstrated in (19).

(19)



Following CBP, when the nominal head in (19) is merged, it triggers spell-out, and the n head and the root are both visible for phonological processes. Likewise, when the K head is merged, it triggers another instance of spell-out, where the K head and nP are visible for phonological processes.

4.2. PALATAL HARMONY CONSTRAINTS. To account for palatal harmony in the Kazakh grammar, two constraints will be used: an agreement by projection constraint (20), and a faithfulness constraint (21).

(20) *[αBACK][βBACK]$_{[+\text{SYLLABIC}]}$ (BACKHARM(ONY)): A segment with some value of the feature [back] may not directly precede another segment with a different back feature value in the ordered set of output segments that are [+syllabic] (i.e. vowels). Assign one violation for each output form where at least one pair of vowels meets these criteria

(21) IDENT-IO(BACK) (ID(ENT)-BACK): Assign one violation if an output segment differs in back value from the corresponding input segment

Due to Kazakh palatal harmony being highly productive, the default weight for BACKHARM should be greater than ID-BACK (as in (22)).

(22) Default constraint weighting for palatal harmony in Kazakh

Constraint	Weight
BACKHARM	3
ID-BACK	1

4.3. ENHANCED VOCABULARY ITEMS. As previously stated, I assume that case markers are the realizations of the K head in Kazakh. When the K head is realized as GEN, ACC, DAT, LOC, or ABL, vocabulary items are specified with a null $\mathcal{R}$ (see (23) for an example with K_{ACC}).

(23) $[K_{ACC}] \leftrightarrow \begin{Bmatrix} \mathcal{F}: & /-\text{NI}/ \\ \mathcal{P}: & [\omega\ -\text{X}] \\ \mathcal{R}: & \text{ø} \end{Bmatrix}$

However, when the comitative is realized on the K head, it is specified with a contentful $\mathcal{R}$ that reweights the constraints in (22), as in (24).

(24) $[K_{COM}] \leftrightarrow \begin{Bmatrix} \mathcal{F}: & /-\text{Mien}/ \\ \mathcal{P}: & [\omega\ -\text{X}] \\ \mathcal{R}: & \text{backHarm}^{-2},\ \text{Id}-\text{back}^{+2} \end{Bmatrix}$

Additionally, in (25) a vocabulary item for *n* is provided, in (26) a vocabulary item for the root *student* is provided, and in (27) a vocabulary item for Num_{PL} is provided, as all three play a role in the analysis in §4.4.

(25) $[n] \leftrightarrow \begin{Bmatrix} \mathcal{F}: & \text{ø} \\ \mathcal{P}: & \text{ø} \\ \mathcal{R}: & \text{ø} \end{Bmatrix}$

(26) $[\sqrt{\text{student}}] \leftrightarrow \begin{Bmatrix} \mathcal{F}: & /\text{oquw}\int\text{ə}/ \\ \mathcal{P}: & \text{ø} \\ \mathcal{R}: & \text{ø} \end{Bmatrix}$

(27) $[Num_{PL}] \leftrightarrow \begin{Bmatrix} \mathcal{F}: & /-\text{LAr}/ \\ \mathcal{P}: & [\omega\ -\text{X}] \\ \mathcal{R}: & \text{ø} \end{Bmatrix}$

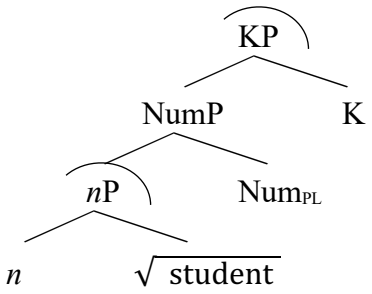
4.4. MODELLING THE CASE PARADIGM: ROUND ONE. I will first attempt to model the case paradigm using CBP as it is described in the previous literature (i.e. Sande & Jenks 2018, Sande 2019, Sande et al. 2020). In doing so, the model fails to capture the nonharmonic comitative marker. In §4.5, I make adjustments to the model based on work by Newell (2008), which will allow for CBP to fully capture the case paradigm in Kazakh.

As was described in §1, Kazakh palatal harmony is iterative (see, e.g., (2)). For this reason, I model an example with multiple morphemes. In (28), the plural marker and the accusative marker harmonize with the [+back] vowels in the root, ɔ:*quwʃə*. In (28), the plural marker harmonizes with the root, but the comitative does not.

(28) a. ɔ:quwʃə-la:r-də
student-PL-ACC
'students(ACC)'
b. ɔ:quwʃə-la:r-mien
student-PL-COM
'with students'

For the examples in (28), I assume the structure in (29):

(29)



When the K head is realized as the accusative marker, none of the vocabulary items are associated with a contentful $\mathcal{R}$ (see (23), (25), (26), and (27)). Therefore, the default constraint weighting applies to both of the spell-out domains in (29). The tableau in (30) demonstrates the optimal output for the first spell-out domain, because it incurs no violations of constraints. The tableau in (31) demonstrates the optimal output for the second spell-out domain, because it only violates ID-BACK which is weighted less than BACKHARM.

(30) Spell-out of first phase: n + root

/ɔːquwʃə/	BACKHARM 3	ID-BACK 1	*H*
a. ☞ [ɔːquwʃə]			0
b. [ɔːquwʃaː]	3	1	4

(31) Spell-out of second phase: [nP] + Num$_{PL}$ + K$_{ACC}$

/[oːquwʃə]-LIEr-NƐ[4]/	BACKHARM 3	ID-BACK 1	*H*
a. ☞ [oːquwʃə-laːr-də]		1	1
b. [oːquwʃə-lier-dɛ]	3		3

When the K head is realized as the comitative marker, K$_{COM}$ is associated with a reweighting of constraints (24). Therefore, the default weighting of constraints is affected for the domain in which K$_{COM}$ is spelled out. The first spell-out domain can still be represented with the tableau in (30). The second spell-out domain is represented by the tableau in (32), where the constraint weights change. The optimal output is option b, because it only violates BACKHARM.

[4] As in Walker (2012), for demonstration purposes, the suffix vowels are [-back] in the input. If the suffix vowel were [+back] in the input, the same results would be achieved.

(32) Spell-out of second phase: [nP] + Num_{PL} + K_{COM}

/[ɔːquwʃə]-LIEr-Mien/	BACKHARM 1	ID-BACK 3	*H*
a. [ɔːquwʃə-laːr-mien]	1	3	4
b. ☞ [ɔːquwʃə-lier-mien]	1	0	1

The optimal output in (32), however, does not match the attested form, ɔː*quwʃə-lar-mien*. This presents an issue. However, following work by Newell (2008), by adjusting the definition of spell-out domains under the CBP approach, this issue can be resolved.

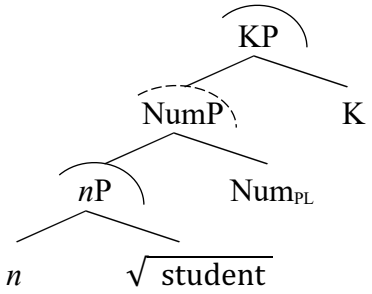
4.5. MODELLING THE CASE PARADIGM: ROUND TWO. As demonstrated in §4.4, applying CBP (wholesale) to the case paradigm does not result in the optimal form of (32) matching the attested form. However, adjusting the definition of spell-out domains under CBP, may buy us what we need.

Recall, under CBP the spell-out domain is the entire phase, as phase heads are spelled out with their complements (Sande & Jenks 2018, Sande 2019, Sande et al. 2020). As previously mentioned, this is a slight departure from traditional 'syntactic' views of phase spell-outs (i.e. Chomsky 2000, 2001), in which phase heads are spelled out separately from their complements at a higher phase.

Newell (2008), argues that there is variation in phase head phonologization. Specifically, as Felice (2022) highlights, Newell (2008) suggests that phases of different types vary with respect to phase heads being phonologized with their complements. Newell (2008) proposes that D, C, and Voice are complement spell-out phases, thus the spell-out domain is the complement of the phase head (and the phase head is phonologized at a later phase). Categorizing heads (*n*P, *v*P, and *a*P), however, are phonologized with their complements.

I argue, following Newell (2008), that K in Kazakh is a complement spell-out phase. Assuming there is variation in phase head phonologization to the CBP model, it is necessary to revisit the data from §4.4, and see if analyzing K as a complement spell-out phase solves our issue. First let's establish the new spell-out domains in (33).

(33)



In (33), the *nP* phase constitutes a spell-out domain (as in §4.4). However, as the complement of the phase head K, NumP constitutes another spell-out domain and K will be spelled out at a later phase.

With this in mind, I revisit the derivation of *n*P + Num_{PL} + K_{ACC} and *n*P + Num_{PL} + K_{COM} respectively. As in the previous derivation, the spell-out domain *n*P is not associated with a contentful $\mathcal{R}$ (see (25) and (26)). Therefore, the tableau in (30) still represents the phonologization of this domain. Turning to the next spell-out domain, which is the complement of the phase head K, $NumP_{PL}$, too, is not associated with a contentful $\mathcal{R}$ (27). Therefore, the

default constraint weighting applies to this spell-out domain. The tableau in (34) represents the phonologization of this domain.

(34) Spell-out of third domain: [nP] + Num_{PL}

/[ɔːquwʃə]-LIEr/	BACKHARM 3	ID-BACK 1	*H*
a. ☞ [ɔːquwʃə-laːr]		1	1
b. [ɔːquwʃə-lier]	3		3

K_{ACC} is then spelled out at later domain higher in the structure. As K_{ACC} is not associated with a contentful $\mathcal{R}$ (23), the default weighting is applied. Therefore, the tableau in (35) represents the phonologization of K_{ACC}.

(35) Spell-out of third domain: [nP + Num_{PL}] + K_{ACC}

/[ɔːquwʃə-lar]-NƐ/	BACKHARM 3	ID-BACK 1	*H*
a. ☞ [ɔːquwʃə-laːr-də]		1	1
b. [ɔːquwʃə-laːr-dɛ]	3		3

As in §4.4, the optimal output matches the attested form. Let's now turn to the problematic *n*P + Num_{PL} + K_{COM}, and see if the updated version of CBP can correctly model this derivation. The first and second spell-out domains are the same as the *n*P + Num_{PL} + K_{ACC} derivation (see (30) and (34)). K_{COM} is then spelled out at a later spell-out domain. It is associated with a contentful $\mathcal{R}$ (24), and this interacts with the default constraint weights. Thus, the tableau in (36) represents the phonologization of K_{COM}.

(36) Spell-out of second domain: [nP + Num_{PL}] + K_{COM}

/[ɔːquwʃə-lar]-MIEn/	BACKHARM 1	ID-BACK 3	*H*
a. ☞ [ɔːquwʃə-laːr-mien]	1		1
b. [ɔːquwʃə-laːr-man]		3	3

In (36) the optimal output does match the attested form, unlike with the model in §4.4. By analyzing K as a complement spell-out phase (cf. Newell 2008), it is possible to capture the Kazakh case paradigm.

5. Conclusion. In this paper, I address the nonharmonic behavior of the Kazakh comitative marker. I argue that the comitative is one of six overtly marked cases. Out of the six case markers, the comitative is the only one that does not partake in palatal harmony. To account for this, I utilize a model of morphology-phonology interface known as Cophonologies by Phase (CBP) (see Sande & Jenks 2018, Sande 2019, Sande et al. 2020). In doing so, CBP seemingly fails to capture the case paradigm. Specifically, assuming that all phase heads are phonologized with their complements presents a serious issue for our analysis. However, Newell (2008) proposes that there is variation in phase head phonologization: Phase heads such as D, C, and Voice are phonologized separately from their complements, whereas categorizing heads are

phonologized with their complements. As I have demonstrated, assuming Newell (2008) while modelling our data via CBP, does capture the case paradigm.

In terms of future research on this topic, I would like to address implications of this analysis on later spell-out domains. Specifically, how does the analysis affect particles that may occur to the right of the nonharmonic comitative marker. Additionally, as demonstrated in this paper, CBP can model within language variation. Specifically, it captures variation in palatal harmony among the language's case markers. I would like to extend this, and analyze cross-linguistic variation – can CBP provide any evidence for diachronic changes in Turkic more generally? The Turkish comitative, for example, does appear to be a post-position. It can occur as a free-standing morpheme or it can be a clitic. The free-standing morpheme is invariant, while the clitic does partake in palatal harmony (Kornfilt 1997: 538). It is possible that in old Turkic the comitative was a post-position and has weakened over time and differently across Turkic languages. In some, it is a post-positional clitic, in some the free-standing morpheme may still exist, while in others (e.g. Kazakh) it is a case marker. CBP may allow for us to account for the comitative being harmonic in some Turkic languages and nonharmonic in others.

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