

# Agglutination and Verb Raising in Kazan Tatar

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In the Kazan variety of Tatar, various affixes append to the verb which denote aspect, negation, and subject agreement in person and number. This paper will discuss a potential explanation for the regular ordering of the inflectional material. It is hypothesized that, like Korean (Aoyagi 2005), this head-final language agglutinates via cyclic, feature-driven raising from  $V^0$  to  $T^0$ , although movement to  $C^0$  is also attested where interrogative force is expressed. This movement is likely motivated by unspecified [V] features of the affixes, which prompt a Copy-Merge operation. This is a cyclic process with a new iteration, thus a more complex head, resulting as each bound morphemes is added.

## 1. Introduction

Kazan Tatar is a variant of Tatar, a Turkic language spoken in the city of Kazan, Tatarstan and the surrounding area. It is a head-final language with agglutinative morphology expressed as suffixes. This survey of the language aims to analyze the behavior of Tatar's main verb and to provide a syntactic account for the ordering of the various bound morphemes which are affixed to the it. Section 2 provides a brief description of the types of morphemes used in conjunction with Tatar verbs, as well as the relative ordering of the morphemes. Section 3 outlines one hypotheses which could explain the behavior exhibited by Tatar verbs as a purely phonological operation. In Section 4, a second hypothesis is proposed which postulates a syntactically driven explanation for Tatar's verbal agglutination. In Section 5, evidence will be offered in support of this second hypothesis, V-to-T movement, as a motivation for the ordering of long strings of inflectional morphemes. Section 6 summarizes the hypothesis and concludes the argumentation.

## 2. Verbal Morphology

Kazan Tatar has a paradigm including six personal endings, which is the product of three persons and two categories of number (1a-f).

(1)	a.	Min PRN. 1s 'I eat.'	aşy. <b>m</b> 'eat'.1s	d.	Bez PRN. 1p 'We eat.'	aşy. <b>bız</b> 'eat'.1p
	b.	Sin PRN. 2s 'You (sing.) eat.'	aşy. <b>sıñ</b> 'eat'.2s	e.	Sez PRN. 2p 'You (pl.) eat.'	aşy. <b>sız</b> 'eat'.2p
	c.	Ul PRN. 3s 'He eats.'	aşy 'eat'.3s	f.	Alar PRN. 3p 'They eat.'	aşy. <b>lar</b> 'eat'.3p

Tatar also aspect (2), and negation (3). It is reasoned that the morphemes highlighted in (2) relate aspect rather than simple tense because the morphological content conveys a sense of telicity. In cases where a consonantal morpheme would affix to a root ending in a consonant, an epenthetic vowel is inserted to avoid the consonant cluster, as is the case for the telic aspect

marker *-d* (2), which surfaces as *-ad* in , which surfaces as *-am*, as well as the negation affix *-m* in (3).

(2)           Min                   kiçe                   aşa.**d**.ım  
 PRN.1s           ‘last night’           ‘eat’.PST.1s  
 ‘I ate last night’ (Compare to 1a.)

(3)           Sin                   aşa.**m**.ıy.sıñ  
 PRN. 2s           ‘eat’.NEG.2s  
 ‘He does not eat.’ (Compare to 1c)

In addition to these markers, Tatar also employs a question clitic to denote interrogative force (4). In this paper, interrogative force is assumed to reside in the finite  $C^0$ , as opposed to Force<sup>0</sup>, as is proposed by Rizzi (1997).

(4)           Sin                   aşıy.sıñ.**mı**  
 PRN.2s           ‘eat’.2s.INT  
 ‘Do you eat?’

Finally, an example of multiple morphemes used in conjunction is offered in (6), which agglutinates negation, tense, person, and interrogative force, respectively. All examples are written using the adopted Latin script<sup>1</sup>. Upon closer inspection of example (5a-c), one can see the rigid ordering of verbal morphemes in Kazan Tatar. in (5c) a reordering of the morphemes produces an unacceptable result.

(5)   a.   Sin                   aşa.**m.ad.iñ.mı**  
           PRN.2s           ‘eat’.NEG.2s.INT  
           ‘Didn’t you eat?’ (Lit. ‘Did you not eat?’)

      b.   Sin                   **bie.m.äd.eñ.me**  
           PRN.2s           ‘dance’.PST.NEG.2s.INT  
           ‘Didn’t you dance?’

      c.   \* Sin                   **bie.m.iñ.äd.me**  
           PRN.2s           ‘dance’.NEG.2s.PST.INT  
           ‘Didn’t you dance?’

The ordering of all verbal affixes seen up to this point follows the schema in (6), where it is assumed that the phi-feature [person] is inflected as a product of merger with T<sup>0</sup>. The existence of  $v$  is assumed on the basis of the Predicate Internal Subject Hypothesis (PISH) (Koopman and Sportiche 1991). Additionally, one assumes the existence of the Aspect head in Tatar (a) on semantic grounds that telicity is understood by the presence of the morphemes and (b) that multiple bound morphemes are not represented under one head prior to movement or agglutination. One may also notice that the diagrams below have Aspect merging after Negation. This is not assumed to be an issue, since a strictly specified ‘schedule’ for the enumerated LIs would assume look-ahead effects, introduce added complexity to the

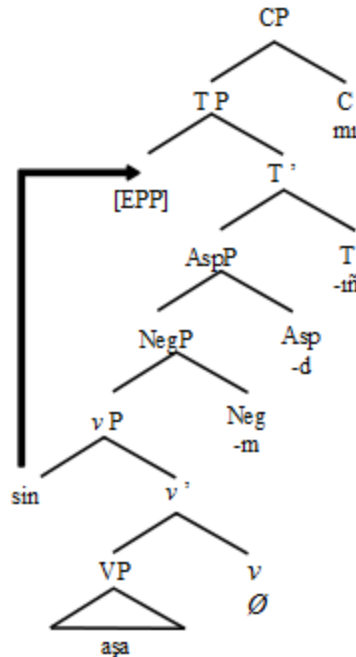
<sup>1</sup> [ñ] is velar nasal /ŋ/. [ɪ] is high central unrounded /ɨ/. [ʃ] is a voiceless alveopalatal fricative /s/. [ç] is a voiceless alveopalatal fricative /ç/.

processing, and would excessively constrain the essential operation Merge, which is assumed to be ‘free’ (Chomsky 2001).

(6) V - (v)- NEG - ASP - PRSN - C

For further illustration, compare the generalization in (6) to a tree diagram depicting the derivation of (5a) in (7) below. Movement of  $V^0$  is not depicted in this diagram, as attention should currently be on the original position of all affixes.

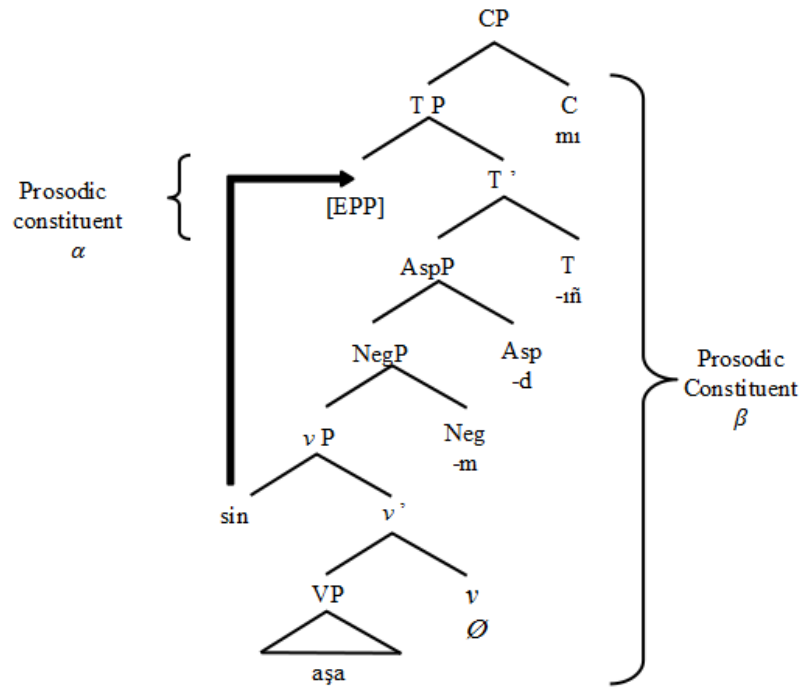
(7)



### 3. Hypothesis 1

In accounting for the agglutination of the morphemes in (5-6), there are two immediately available explanations. First, it may be suggested that agglutination is a purely phonological operation which takes place at Spellout, and that there is no overt movement of the  $V^0$ . This predicts that the affixes are selected from the lexicon during the numeration as *unbound* affixes and the derivation proceeds cyclically via the operation Merge. According to the phonologically motivated hypothesis, the various morphemes would affix to the matrix verb as a result of adjacency during the linearization process. The resulting hypothetical structure is depicted in (8).

(8)



The phonologically motivated agglutination hypothesis warrants additional explanation, however. Firstly, Tatar exhibits a common characteristic of Turkic languages: vowels are harmonized according to backness features<sup>2</sup>, as demonstrated by the two examples in (9a-b).

(9a) shows harmony in a lexical root, while (9b) demonstrates harmony in an inflected morpheme. Secondly, most prosodic words in Tatar are stressed on the final syllable, with the exception of loan words. As seen in (10, 12), the stress falls on the last syllable of the morphologically complex verb. These two facts demonstrate that the affixes must be unified under one head in order for the vowels to properly harmonize and for stress to land on the ultimate syllable.

- (9) a.     *ñbaş* ‘elbow’                                    b.     *biylär* ‘they danced’  
(10) a.     *jilkä’lär* ‘shoulder blade’ (pl.)                                    b.     *yäzd’im* (‘I wrote’)

Vowel harmony in Tatar is restricted to word boundaries, rather than phrasal boundaries. In (11a) it is apparent that though the theme and the verb are complements, hence existing as sisters in the VP, the vowels in the object harmonize for frontness while the verb and its inflectional affixes are harmonized for backness. (12) demonstrates vowel harmony and stress patterns of a postpositional phrase. Witness how the postposition and its complement also do not need to harmonize. Word stress

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<sup>2</sup> /i/ patterns with the back vowels in Tatar backness harmony. [ä] is a mid-front unrounded vowel /æ/. [j] is a voiced alveolar fricative /ʒ/.

in Tatar also falls naturally on the last syllable (cf. 10-12), which is further evidence of the inflected verb's status as both a phonological and a morpho-syntactic constituent.

- (11) a.        min                    göbädiyäne        aša'dım  
                  PRN.1s                    pasty-ACC        eat.PST.1s
- (12) b.        karandaş.'lar        tartma                öşön'dä  
                  pencils.plural        'box'                'inside'  
                  'pencils in the box'

Furthermore, under the assumption that Spellout is driven cyclically (Chomsky 2001), at the merger of each next-highest phase head, the constituents of the agglutinated form (7) cross a phase boundary (Spec-*v*P) and would be parsed in two chunks, the [V-*v* chunk], which is inaccessible after the merger of Spec-*v*P, and the [Neg-T-C] chunk which is spelled out after the merger of C<sup>0</sup>, since the phi-feature [person] is acquired at T<sup>0</sup>. If V were sheltered from access by the Phase Impenetrability Condition (Chomsky, 2001), then it would be unable to participate in agreement relations that vowel harmony is assumed to require. In addition to these factors, it must also be explained how the prosodic phrase boundaries are inferred from the syntactic structure without assuming unification via movement.

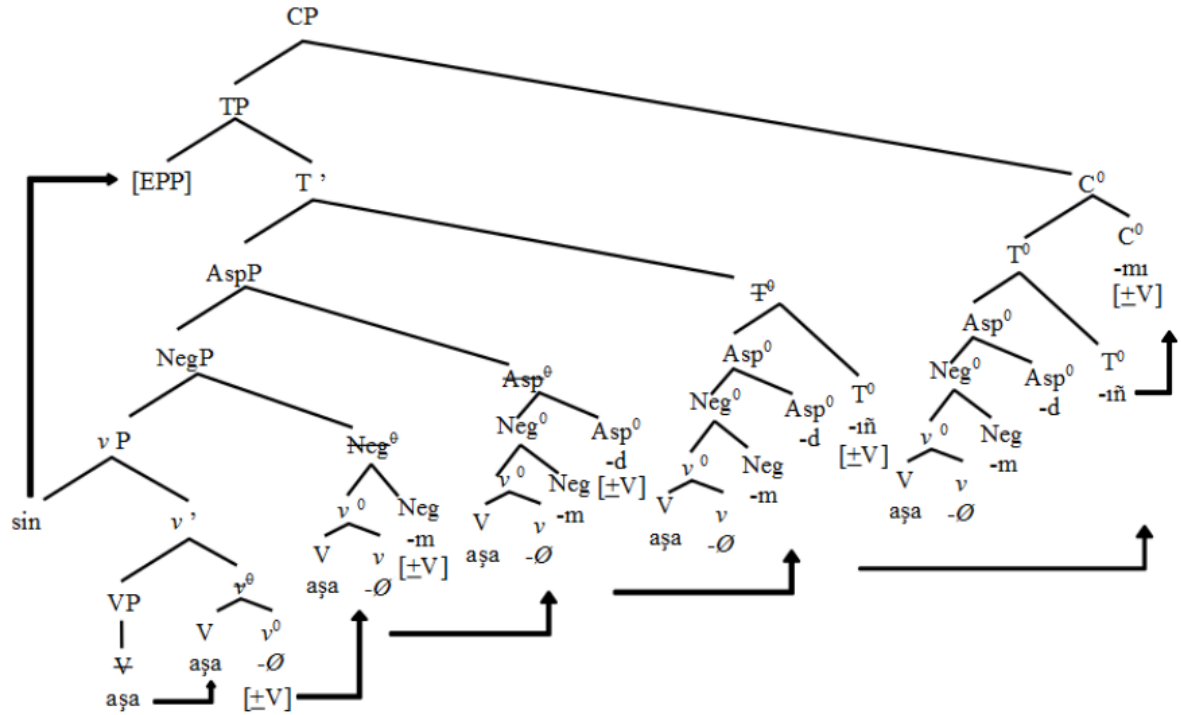
On the basis of Tatar's morphophonological behaviors, it is enough to reject the hypothesis that agglutination is a purely phonological operation. Vowel harmony in Tatar is restricted to word boundaries rather than phrasal or phasal. Natural stress patterns in Tatar are maintained even with highly morphologically complex verbal strings. Additionally, general computational assumptions predict that parts of the verb-affix string would be spelled out separately, unless they occupied a single or complex head which was assembled after the first phase boundary.

#### 4. Hypothesis 2

An alternative hypothesis is that agglutination occurs as a result of syntactic operations; specifically, through feature-driven raising. According to this hypothesis, the derivation proceeds thusly: the necessary affixes are selected from the lexicon during the numeration, each of which are unspecified for some feature F, presumably a feature [u\_bound] or verbal feature [u\_V], which gives the affixes the surface appearance of bound morphemes (as opposed to unbound in Hypothesis 1). Hence, this hypothesis predicts that it is ungrammatical for one of the inflectional morphemes to occur in a position other than what is illustrated in the surface structure in (6) or to appear unbound and without a verbal host. This hypothesis assumes a copy theory of movement along the lines of Chomsky's *Minimalist Program* (1995). The proposed structure of (5c), restated for ease of reading as (13), is illustrated in (14) below.

- (13)                                Sin                    aša.m.ad.ĩn.mi  
                  PRN.2s                    'eat'.NEG.2s.INT  
                  'Didn't you eat?' (Lit. 'Did you not eat?')

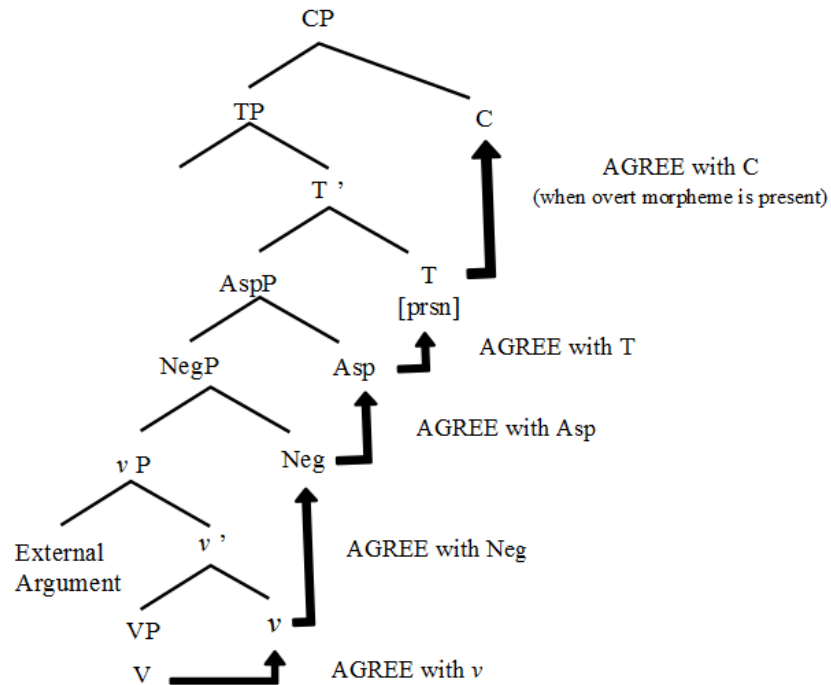
(14)



A formalization of Hypothesis 2, which is to serve as a model of verbal agglutination appears in

(15):

(15)



As the derivation proceeds, complex heads are repeatedly merged to each bound affix as a product of standard feature checking operations to value the unvalued [u\_V] features via the operation Agree, where V is merged to  $v^0$  forming complex head  $[[V^0] v^0]$ ,  $v^0$  is merged to  $Neg^0$  creating another complex head, and so on throughout the derivation until complex head  $T^0 [[[[[V^0] v^0] Neg^0] Asp^0] T^0]$  is formed by the merger of  $Asp^0 [[[[V^0] v^0] Neg^0] Asp^0]$  to  $T^0$ . This upward cycle persists for an additional iteration in clauses with interrogative force, where the interrogative affix  $-m_1$  in  $C^0$  merges with complex head  $T^0$ . For the aid of the reader, a bracketed, stepwise description of this derivation is provided in (16) (cf. 6, 14).

- (16) sin            aša.Ø.m.ad.iñ.m<sub>1</sub>            ‘Did you eat?’
- a.  $_{VP}[ aša V^0 ] > aša$
  - b.  $_{vP}[ _{VP}[ aša V^0 ] -Ø v^0 ] > aša-Ø$
  - c.  $_{NegP}[ _{vP}[ _{VP}[ aša V^0 ] -Ø v^0 ] -m Neg^0 ] > aša-Ø-m$
  - d.  $_{AspP}[ _{NegP}[ _{vP}[ _{VP}[ aša V^0 ] -Ø v^0 ] -m Neg^0 ] -d Asp^0 ] > aša-Ø-m-ad$
  - e.  $_{TP}[ _{AspP}[ _{NegP}[ _{vP}[ _{VP}[ V^0 ] -Ø v^0 ] -m Neg^0 ] -d Asp^0 ] -iñ T^0 ] > aša-Ø-m-ad-iñ$
  - f.  $_{CP}[ _{TP}[ _{AspP}[ _{NegP}[ _{vP}[ _{VP}[ V^0 ] -Ø v^0 ] -m Neg^0 ] -d Asp^0 ] -in T^0 ] -m_1 C^0 ] > aša-Ø-m-ad-iñ-m_1$

However, one additional condition must be met. In order to obtain a grammatical result, avoiding multiple pronunciations of the copied content, only the top copy in the movement chain is realized phonetically during Spellout. This has been formulated as the Chain Minimization Principle in (17) (Aoyagi, 2005 p.11)

(17) **Chain Minimization Principle**

Other things being equal, all copies in a chain except the highest are deleted to minimize features.

## 5. Evidence of Verb Raising

The proposal sketched above in (15) already nicely accounts for the patterns discussed above; vowel harmony and computational timing. By uniting all of the bound morphemes under a complex head (via Merge), the word boundary is again clearly delineated by the structure and the phonological parsing of the vowels is intuitive. In other words, a syntactically motivated model of agglutination obviates the need to postulate a complex phrase structure rule for phonological processes in Tatar such as harmony and stress.

In terms of computation, in order to receive a properly unified, ordered Spellout, the verb and its inflections must be processed within the same phase before reaching the phonological (or sensorimotor) interface. This again affects the boundaries of phonological constituents. If the necessary constituents of the whole verbal unit that were generated below  $v$ , the first strong phase (Chomsky 2001), then the phonological content of those objects would be separated by a phase boundary. As mentioned above, when the external argument is merged to the  $vP$ , a phase boundary is realized. Spellout is assumed to take place at the next highest phase boundary. In a movement-free derivation, where the V remains in the VP, the only content from the verbal string is the main verb itself; the

phonologically null *v* is added to the ‘Spellout queue’ as part of the next phase. This content is inaccessible to processing operations at later stages, leaving the remaining, *bound* affixes syntactically stranded. Accounting for their rearrangement on the surface would necessitate an additional layer of explanation. The second hypothesis utilizes only the essential mechanics that are employed elsewhere in the derivation, e.g Merge and Agree. This renders Hypothesis 2 the simplest, and therefore the most elegant one, as well as having the superior descriptive potential that it does.

Beyond phonological and theory internal evidence in support of verb raising, there is also syntactic evidence that lends support to the syntactic explanation. The morphological prediction of Hypothesis 2 is that the inflectional morphemes are bound, and hence cannot stand alone. This prediction is borne out in (19), which is in multiple ways ill formed. First, it is a violation of the Head Movement Constraint, since  $V^0$  must have moved beyond  $Neg^0$  in order to Agree with T and be inflected for its phi-features. Secondly, and in a way relevant to this discussion, the negation expressing morpheme cannot appear as a solitary constituent, by virtue of its [bound] feature or unspecified [V] feature, and the derivation crashes.

- (18) \*sin            **m**        aş.ıy.sıñ  
 PRN. 3s        NEG    ‘eat’ .3s  
 ‘You do not eat.’
- (19) min            **kiçä**        **aşadım**  
 PRN.1s        ‘last night’    eat.PST.1s  
 ‘I ate last night’ cf. (2)
- (20) min            **göbädiyäne**    **aşadıym**  
 PRN.1s        pasty-DEF    eat.PST.1s  
 ‘I ate the pasty.’ cf. (11)

Unfortunately for syntacticians, it is rare to obtain physical proof of relative position to, or intervention by, objects such as adverbial adjuncts by nature of the fact that Kazan Tatar is a relatively uniform head-final language. Thus, the verb generally appears at the end, after both complements and adverbial adjuncts, rendering usual tests for head movement rather uninformative. See examples above; (20) for adverbials and (21) for theme complements.

One syntactic test which could indicate whether an inflected verb in Tatar is a constituent is topic raising. The premise of the test is that only a constituent can be raised to topic position. Given below in (22) is a short dialogue about a party. One can see in the third phrase that the inflected verb, *bidek*, is raised as a clarification. This shows that, as opposed to what is assumed by Hypothesis 1, an inflected verb is indeed morphologically whole; that is, that agglutination does not result from string together multiple nodes during linearization. That the verb can be topicalized further demonstrates agglutination as a result of movement, and the construction of a complex head.



(21)

Tege şimbä kön.ne klubka töşkän idek,  
DET 'saturday' 'day'.ACC 'club' 'down' 'go.1p

häm şundy şäp biedek.  
'and' INTNS 'well' danse.PST.1p  
'Last Saturday, we went to the club, and danced a lot' - *Speaker 1*

Ä, sez böten.egez bidegez mällä?  
'Ah' PRN.2s 'all'.2p 'dance'.PST.2p 'really'  
'So you, all of you, danced, really?' - *Speaker 2*

Äye, **biedek**, botene.bez biedek  
'yeah' 'dance'.PST.1p 'all.1p 'dance.PST.1.

ul şimbä kön.ne  
DET 'Saturday' 'day'.ACC  
'Yes, **we danced**, all of us danced that Saturday.' - *Speaker 1*

## 5. Conclusion

Verbs in Kazan Tatar have a rich inflectional morphology. These verbs serve as hosts for various affixes to show meaning including negation, interrogative force, and agreement in person and tense. Additionally, there is a rigid ordering restriction in which these affixes are merged with the verb. The goal of this paper has been to give one potential explanation for this ordering. A syntactic, movement motivated explanation succeeds in describing the surface form of the wholly inflected verb where a purely phonological explanation fails. Rather than attributing the ordering and merger of the affixes and the verb to phonological processes during linearization, multiple factors conspire to make this hypothesis a less favorable alternative to the one outlined in this paper. Vowel harmony is restricted to word boundaries, and all verbal affixes are harmonized to agree with the root. Stress falls on the ultimate syllable, which holds true for the complex verbal strings, indicating that they are a singular morphological unit. Essential computational processes during the derivation (i.e. phase boundaries and cyclic Spellout) would interrupt the string, if it were not raised over the course of the derivation. Furthermore, the inflected verb acts as a constituent in tests involving topicalization. All evidence supports an analysis of agglutination in Kazan Tatar which is motivated by verb raising to T, or C in cases where there is an overt morpheme (e.g question marker).

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