

## Article

# Disentangling Words, Clitics, and Suffixes in Uyghur

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**Abstract:** Turkic languages have been shown to form words using a wide range of word-formation strategies, such as suffixation, cliticization, and auxiliaries. The present paper offers a detailed description of word formation in Uyghur, compares the patterns in Uyghur with the prior literature on Turkic, offers explicit diagnostics for suffixes and clitics, and proposes a morpho-syntactic analysis for each strategy.

**Keywords:** head movement; word formation; clitic; suffix; auxiliary; Uyghur

## 1. Introduction

The relationship between the syntactic component and the ways in which morphemes are bundled into words at PF is a longstanding puzzle. The Mirror Principle (Baker 1985), which proposes that morphological derivations must directly reflect syntactic derivations (and vice versa), has played a prominent role with respect to the ways in which the literature relates morpheme orders and syntactic derivations. By adopting the Mirror Principle, one is required to offer an account of apparent exceptions. Furthermore, the Mirror Principle itself is informative with respect to order, but it does not determine whether a given morpheme will be realized as a suffix, clitic, or an auxiliary. We adopt the following definitions in this paper: suffixes and enclitics (henceforth clitics) form a prosodic word with the material on their left, while auxiliaries form independent prosodic words. Clitics and suffixes are differentiated in that suffixes form tighter units with the material they are combined with than clitics, both syntactically and phonologically. The clitics we discuss in this paper are primarily what Zwicky (1985) refers to as “simple” clitics, which are free morphemes that when phonologically reduced may become phonologically subordinated to another word. These clitics alternate with strong forms (auxiliaries in our case). In other words, these are closer to reduced forms of pronouns in English (e.g., “We saw’em yesterday”) than pronominal clitics in Romance.

Turkic languages, in particular, exemplify these complexities (Fenger 2020; Gribanova 2020; Kornfilt 1996). In Turkish (Southwestern Turkic), for instance, the conditional morpheme can be realized as a suffix when it combines with a verbal element (1a), in which case it harmonizes with the root and bears word-level stress. In complex tenses involving participials, word-level stress shifts to the participial, in which case the conditional can either be realized as a clitic (1b) or with the copula *i-* (1c).<sup>1</sup>

- (1) a. git-sé-m  
go-COND-1SG  
‘if I go’ (adapted from Kornfilt 1996, p. 96)
- b. gid-ecék-se-m  
go-FUT-COND-1SG  
‘if I will go’ (adapted from Kornfilt 1996, p. 102)



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- c. gid-ecék i-se-m  
 go-FUT COP-COND-1SG  
 ‘if I will go’ (adapted from Kornfilt 1996, p. 102)

Kornfilt (1996) argues that genuine suffixes (1a) are inflections of the main verb, while the conditional + AGR in (1b) and (1c) are treated as inflections of the copula, which happens to be null in the former case. Gribanova (2020) discusses similar data in Uzbek (Southeastern Turkic), proposing that the equivalent data in Uzbek are derived via three distinct morphological processes. Suffixation is accomplished via roll-up head movement, cliticization results from Local Dislocation, and the Uzbek equivalent to the copula *i-* results from E-SUPPORT, a process akin to *do-support* in English. The present paper builds upon these proposals based on novel data from Uyghur (Southeastern Turkic).

The first contribution of this paper is that it provides a detailed case study of the morphological complexity of the Uyghur verbal and tense/evidentiality domains. This is of value to both the Uyghur and Turkic literatures. From a theoretical perspective, we build upon the model of Uzbek in Gribanova (2020). We propose a cyclic analysis of word formation in Uyghur, where suffixation is accomplished in the narrow syntax via roll-up head movement. Auxiliaries are shown to merge in the narrow syntax and subsequently undergo roll-up head movement like lexical verbs do. Finally, we show that cliticization involves a distinct process. We follow Gribanova (2020) in assuming that Local Dislocation is responsible for determining the order of clitics. We also offer morpho-syntactic and morphophonological diagnostics for Uyghur that make evaluating the predictions of this proposal concrete. This expands the discussion of the aforementioned Turkic languages, providing evidence for analyses that treat auxiliaries as elements that are merged into the structure in the narrow syntax (Arregi and Pietraszko 2021; Cowper 2010; Déchaine 1995; Pietraszko 2017). We show that it is necessary to differentiate between heads that are rolled up into complex heads via head movement (Subwords) and those that are maximal heads or M-words (Embick and Noyer 2001). We ultimately suggest that it is unclear whether Local Dislocation is able to account for all of the Uyghur data, in particular when the process would need to iterate. As a result, we sketch the beginnings of a distinct proposal that treats reordering as an optimizing process, where re-ordering is an altruistic process by which something is gained. This updated proposal does not necessarily require that the mechanism responsible for re-ordering be Local Dislocation.

The structure of this paper is as follows: Section 2 provides an overview of the empirical picture and analyses proposed for Turkish and Uzbek. Section 3 introduces the formal tools and diagnostics we use to account for the differences between suffixation, cliticization, and auxiliaries. We also introduce the core data in Uyghur. In Section 4, we extend our analysis to more complex constructions, highlighting some the strengths and weaknesses of our proposal. Section 5 offers discussion of the implications of our proposal and then we conclude in Section 6.

## 2. Background on Related Languages

This paper builds upon discussions of similar phenomena in Turkish (Kornfilt 1996) and Uzbek (Gribanova 2020). In this section, we summarize the empirical facts and analyses proposed for both languages to set the stage for discussion of Uyghur. Both languages, like Uyghur, have distinct word-formation strategies that give rise to differences in morpheme order and phonological properties. Despite the fact that this basic contrast exists in Turkish, Uzbek, and Uyghur, each language provides different insights into these word-formation strategies.

### 2.1. Turkish

Kornfilt (1996) discusses two different agreement paradigms in Turkish that are conditioned by tense/aspect/mood. Kornfilt (1996) argues that there is one set of genuine verbal forms that are used in cases like the definite past and the conditional. An example of this paradigm is provided in (2).

- (2) a. git-ti-m “leave-PST-1SG” (adapted from Kornfilt 1996, p. 96)  
 b. git-ti-n “leave-PST-2SG”  
 c. git-ti-Ø “leave-PST-3SG”  
 d. git-ti-k “leave-PST-1PL”  
 e. git-ti-niz “leave-PST-2PL”  
 f. git-ti-ler “leave-PST-3PL”

The second paradigm involves what Kornfilt (1996) calls “fake” tenses, which contain an overt participle and agreement. An example is shown in (3). This agreement paradigm differs from the definite past, particularly in the 1PL, 2SG, and 2PL. Kornfilt (1996) argues that the constructions in (3) contain a covert copula that is responsible for introducing this agreement paradigm, unlike the genuine verbal suffixes in (2). In this way, the agreement markers are actually inflections of the copula, not the verb.

- (3) a. git-miş-Ø-im “leave-PST.REP-COP.PRES-1SG” (adapted from Kornfilt 1996, p. 97)  
 b. git-miş-Ø-sin “leave-PST.REP-COP.PRES-2SG”  
 c. git-miş-Ø-Ø “leave-PST.REP-COP.PRES-3SG”  
 d. git-miş-Ø-iz “leave-PST.REP-COP.PRES-1PL”  
 e. git-miş-Ø-siniz “leave-PST.REP-COP.PRES-2PL”  
 f. git-miş-Ø-ler “leave-PST.REP-COP.PRES-3PL”

Although the copula is covert in the cases above, it is realized in certain contexts. For instance, in underived adjectives, such as *hastá* (“sick”), the copula is overtly realized as *y* (4).<sup>2</sup>

- (4) a. hastá-y-miş-im “sick-COP-PST.REP-1SG” (adapted from Kornfilt 1996, pp. 98–99)  
 b. hastá-y-miş-sin “sick-COP-PST.REP-2SG”  
 c. hastá-y-miş-Ø “sick-COP-PST.REP-3SG”  
 d. hastá-y-miş-iz “sick-COP-PST.REP-1PL”  
 e. hastá-y-miş-sünüz “sick-COP-PST.REP-2PL”  
 f. hastá-y-miş-lar “sick-COP-PST.REP-3PL”

Also notice the placement of stress in these cases. Kornfilt (1996) systematically shows that suffixes in “fake” tenses do not attract word-level stress, instead it is the element that precedes them. In the cases above, it is the syllable preceding the apparent copula that attracts stress.<sup>3</sup>

In the contexts where *y* can be used, the copula can also be realized as *i* at the beginning of a new prosodic word (5). Kornfilt (1996) refers to the realization as *y* as the *weak form* of the copula, and to *i* as the *strong form*.

- (5) a. hastá i-miş-im “sick-COP-PST.REP-1SG” (adapted from Kornfilt 1996, p. 100)  
 b. hastá i-miş-sin “sick-COP-PST.REP-2SG”  
 c. hastá i-miş-Ø “sick-COP-PST.REP-3SG”  
 d. hastá i-miş-iz “sick-COP-PST.REP-1PL”  
 e. hastá i-miş-siniz “sick-COP-PST.REP-2PL”  
 f. hastá i-miş-lar “sick-COP-PST.REP-3PL”

These data show that the same agreement paradigm is applied to the copula in both weak and strong forms, as well as verb + participle forms. Kornfilt (1996) thus suggests that there is a dependency between particular heads (verbal vs. copular) and the realization of agreement.

An anonymous reviewer questions whether a zero copula can reasonably be expected to take inflection or enter into the calculus for linearization. Despite being a zero copula

(we will call it an auxiliary in Uyghur), there are prosodic reflexes discussed at length by Kornfilt, also observed in Uyghur, that suggest speakers recognize the position of the copula that was diachronically present in all environments. If we take the morphology following the silent copula (or auxiliary) to be simple clitics, these elements are enclitics that lean to their left. In many ways, it is difficult to determine whether this morphology is literally leaning on the zero copula (or auxiliary) or if this element is entirely invisible at PF. Given that this element enters into the calculus for stress assignment, it seems that we already need to make reference to it at PF. Thus, following Kornfilt, we assume that this verbal element is present in these contexts. We discuss the implications for linearization in Sections 3 and 4.

In addition to the correlation between heads and agreement paradigms, there are other pieces of evidence for making a split between genuine verbal forms and copular forms. These include different realizations of negation and different positions of the Q particle.

First, verbal negation involves the suffix *-mA*, which merges with the verb root, as in (6a). In contexts where Kornfilt (1996) argues that a copula is present, the negation is realized as *değil-*, which is an independent prosodic word that hosts the reported past *miş* and agreement, as in (6b).

- (6) a. *git-me-di-m*  
 leave-NEG-PST-1SG  
 “I didn’t leave.” (Kornfilt 1996, p. 104, (19a))
- b. *gid-ecek değil-miş-im*  
 leave-FUT NEG-PST.REP-1SG  
 “It is said that I will not go.” (Kornfilt 1996, p. 105, (21))

The Q particle *mi* is also realized differently when it occurs with genuine verbs (7a) vs. copular forms (7b). In the former case, the Q particle occurs sentence-finally after agreement. In the latter, it intervenes between the participle and agreement.

- (7) a. *git-{\*mi}-ti-niz-{mi}?*  
 go-Q-PST-2SG-Q  
 “Did you go?” (Adapted from Kornfilt 1996, p. 106)
- b. *gid-ecek-{mi}-siniz-{\*mi}?*  
 leave-FUT-Q-2PL-Q  
 “Will you go?” (Adapted from Kornfilt 1996, p. 106)

For reasons of space, we do not walk through all of the argumentation presented by Kornfilt (1996), but in addition to the contrast between agreement paradigms, the form of negation, and the position of the Q particle, she additionally provides support from stress and suspended affixation that all align in support of the proposed distinction between genuine verbal forms and copular forms.<sup>4</sup>

## 2.2. Uzbek

We present a more detailed description of Uzbek here due to it being the most closely related language to Uyghur. Gribanova (2020) presents an analysis of data in Uzbek similar to the Turkish data presented in the previous section. Her analysis builds on Kornfilt (1996), focusing on some of the idiosyncratic properties of Uzbek. The biggest difference between these studies is the way that relationship between affix type and word-formation strategy is analyzed.

- (8) *Verbal Predicates*
- a. *Yoz-a-siz.*  
 write-PRS-2  
 “You write.” (Gribanova 2020, p. 8, (7a))

- b. Yoz-d-ingiz.  
write-PST-2  
“You wrote.” (Gribanova 2020, p. 8, (7b))

Uzbek has a similar distinction in agreement paradigms to Turkish, as shown in (8a) and (8b). While Kornfilt (1996) accounts for the differences in Turkish on the basis of copular vs. non-copular constructions, suggesting that verbal constructions like (8a) involve a null copula that is inflected for TAM and agreement, Gribanova (2020) instead argues that the verbal constructions in (8a) and (8b) should receive the same morpho-syntactic analysis: the distinctions between the two correspond to idiosyncractic realizations of different morphological feature bundles, rather than any morpho-syntactic difference. Thus, while Gribanova (2020) follows Kornfilt (1996) in assuming an important structural distinction between copular and non-copular forms, she does not interpret the Uzbek facts surrounding the different verbal agreement paradigms as a diagnostic for the presence of the copula. In other words, the differences in how agreement is realized in (8a) and (8b) are treated as irrelevant to the particular problems that the paper sets out to solve. Our proposal for Uyghur falls more closely in line with Kornfilt (1996) on this point.

In addition to agreement, the realization of negation is similarly sensitive to verbal vs. non-verbal constructions. Negation surfaces as *-ma-* when it attaches with a verbal predicate (9) and *-mas* for non-verbal predicates (10).

- (9) a. Yoz-ma-y-man.  
write-NEG-PRS-1SG  
“I don’t write.”  
b. Yoz-ma-d-im.  
write-NEG-PST-1SG  
“I didn’t write.”  
c. \*Yoz-ma(s) e-d-im.  
write-NEG E-PST-1SG  
Intended: “I didn’t write.”

(Gribanova 2020, p. 10, (15a–c))

- (10) a. Talaba-mas-man.  
student-NEG-1SG  
“I’m not a student.”  
b. \*Talaba-ma(s)-d-im.  
student-NEG-PST-1SG  
Intended: “I was not a student.”  
c. Talaba-mas e-d-im.  
student-NEG E-PST-1SG  
“I was not a student.”

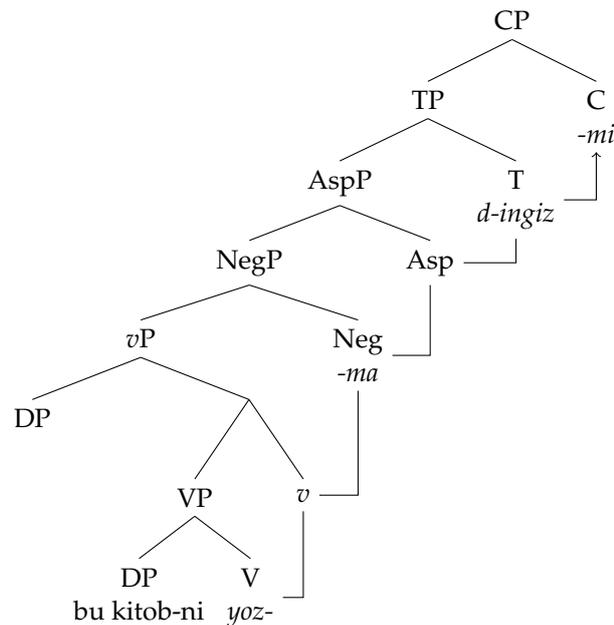
(Gribanova 2020, p. 11, (16a–c))

Because of these observations, Gribanova (2020) assumes that the division between verbal and non-verbal predicates is responsible for allomorph selection.

### 2.2.1. Verbal Predicates and Head Movement

The structural analysis provided by Gribanova (2020) for verbal forms like (8a) and (8b) is provided in (11a). These suffixes, akin to Kornfilt (1996)’s genuine verbal forms, are derived via roll-up head movement, which unifies all heads in the spine.

(11) a.



b. Bu kitob-ni yoz-ma-d-ingiz-mi?  
 this book-ACC write-NEG-PST-2-Q

'Didn't you write this book?' (Gribanova 2020, p. 17, (29a–b))

Head movement is restricted to adjacent heads in the syntactic structure, leading to each head that undergoes movement raising to form a complex head with the head immediately above it in the structure (Koopman 1984; Travis 1984). This is taken to be reflected at PF by fixing the linear order of the morphemes involved. Gribanova (2020) notes that all speakers agreed on the morpheme order judgments for words formed by head movement.

### 2.2.2. Nonverbal Predicates

Gribanova (2020) motivates a different structure for unambiguously non-verbal predicates (12b), treating them as copular constructions that lack *v*, and thus verbal predication. These constructions instead involve PredP. Gribanova (2020) suggests that the copular head of PredP is covert in both the present (12a) and (12b).

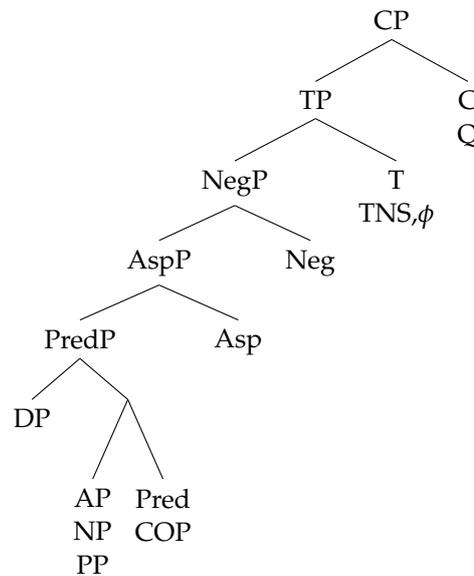
(12) *Non-verbal predicates*

a. Qiziq-siz  
 interesting-2  
 "You are interesting."

b. Qiziq e-d-ingiz  
 interesting E-PST-2  
 "You were interesting." (Gribanova 2020, p. 8, (9a–b))

At first glance, (12) appears to host a copula in *edingiz*, akin to Kornfilt (1996)'s treatment of the equivalent element in Turkish. This would further be supported by the fact that two distinct agreement forms appear. Instead, Gribanova (2020) suggests that this element is not a copula, but is post-syntactically inserted to provide phonological support (similar to *do-support* in English). Gribanova (2020) argues for the structure in (13) for non-verbal forms.

(13)



Example (14) shows examples of how negation and tense are realized in non-verbal forms. In non-verbal structures involving copular predication, negation is high. It does not merge directly with the predicate, instead appearing higher in the clausal spine, similar to *değil* in Turkish. Thus, the low suffixal negation found in verbal negation is unavailable in non-verbal structures (14a).<sup>5</sup>

- (14) a. \* Talaba-mas-d-ingiz.  
 student-NEG-PST-2
- b. Talaba e-mas e-d-ingiz.  
 student E-NEG E-PST-2  
 “You weren’t a student.”
- c. Talaba-mas e-d-ingiz.  
 student-NEG E-PST-2  
 “You weren’t a student.”
- d. ? Talaba e-mas-d-ingiz.  
 student E-NEG-PST-2  
 “You weren’t a student.” (Gribanova 2020, p. 11–12, (19a–d))

### 2.2.3. E-SUPPORT

Negation and tense on non-verbal forms must be realized using E-SUPPORT. E-SUPPORT is treated as a phonological support mechanism by which E is supplied to host certain morphemes (e.g., negation/tense/agreement/evidentiality) when they combine with a non-verbal form. Notice in (14b) that E may be inserted twice: once to host negation and once to host tense and agreement. It is also possible for negation to attach directly to the predicate nominal *talaba* ‘student’, and for tense and agreement to be realized independently with E-SUPPORT (14c). A marginally acceptable, though possible, third option is presented in (14d), where a single instance of E-SUPPORT hosts negation, tense, and agreement morphology.

Gribanova (2020) points to the existence of constructions such as (14b) with two separate instances of E as evidence against a copular analysis of *e-* and in support of a phonologically conditioned analysis of E.<sup>6</sup> E-SUPPORT is supplied in contexts where head movement does not or cannot apply. For instance, the past tense morpheme *-d-* requires a verbal element on its left (the verb and verbal morphology). In (14), at least one instance of E-SUPPORT is required to prevent T from combining with something that is non-verbal. However, this does not rule out analyzing E as an auxiliary verb that merges in the narrow syntax that can satisfy the verbal requirements of morphemes that require a verbal host.

#### 2.2.4. Local Dislocation

If we consider interrogatives involving non-verbal elements, we see an additional ordering pattern that does not involve E-SUPPORT. Consider the cases in (15). [Gribanova \(2020\)](#) takes the output of the syntax to be (15a). Each of the cases in (15b)–(15d) are well-formed at PF. The primary issue that needs to be resolved in mapping from syntax to PF is that the past tense marker must have something verbal on its left.

In (15b), *-mas* attaches directly to *qiziq*. Since *qiziq-mas* ('interesting-NEG') is not verbal (see (14)), T and Q are inverted: this results in T no longer being adjacent to the non-verbal predicate (it is instead adjacent to Q), resulting in a well-formed structure. In (15c), E-SUPPORT applies and *e-* combines with non-verbal negation (*-mas*) and inversion between T and Q takes place, which prevents T from combining with non-verbal negation.<sup>7</sup> Finally, in (15d), when two instances of E-SUPPORT take place, the Q particle is able to remain in final position, because E intervenes between the non-verbal material and T.

- (15) a. *Syntactic Output*
- Qiziq      mas d    ingiz mi?  
interesting NEG PST 2      Q
- b. Qiziq-mas-mi-d-ingiz?  
interesting-NEG-Q-PST-2  
"Weren't you interesting?" ([Gribanova 2020](#), p. 18, (34a))
- c. Qiziq      e-mas-mi-d-ingiz?  
interesting E-NEG-Q-PST-2  
"Weren't you interesting?" ([Gribanova 2020](#), p. 17, (31a))
- d. Qiziq      e-mas e-d-ingiz-mi?  
interesting E-NEG E-PST-2-Q  
"Weren't you interesting?" ([Gribanova 2020](#), p. 17, (31c))

[Gribanova](#) suggests that inversion is required when *-d-* is part of a synthetic form and non-verbal negation or a non-verbal root is to its left. For further details, we direct the reader to [Gribanova \(2020\)](#).

[Gribanova \(2020\)](#) suggests that inversion results from the application of Local Dislocation ([Embick 2003](#); [Embick and Noyer 2001](#)). Local Dislocation is defined in (16) (the star indicates immediate precedence).

- (16) Local Dislocation (as formulated in [Kramer 2009](#)):  
 $X * Y \rightarrow X - Y \text{ or } Y - X$

[Gribanova \(2020\)](#) restricts the application of inversion to T and Q (recall that T + AGR forms a single head). The output of Local Dislocation can be string vacuous ( $X - Y$ ) or can result in inversion between heads ( $Y - X$ ). Local Dislocation is responsible for the string-vacuous combination of *qiziq* and *-mas* in (15b), as well as for the cases of inversion in (15b) and (15c).

Thus, E-SUPPORT or Local Dislocation (or both) are used in cases where head movement does not or cannot apply. Local Dislocation keeps heads within the same prosodic word, while E-SUPPORT begins a new prosodic word. To some extent, whether head movement, Local Dislocation, or E-support applies is specified on a morpheme-by-morpheme basis.

#### 2.2.5. Participial Constructions

Before turning to Uyghur, we must finally introduce participial constructions, which show mixed behavior with respect to being verbal or non-verbal. The next section demonstrates that these mixed properties can be modeled using the tools introduced above: head movement, E-SUPPORT, and Local Dislocation.

Examples of participial constructions are provided in (17). Unlike copular constructions, these constructions contain *v*, introducing verbal predication. Participial constructions contain a participle (e.g., *-gan*, which is an aspectual suffix). It can occur without overt tense-marking (17a) or with it (17b). Note the distinct agreement paradigms in each case.

(17) *Participial forms*

- a. Yoz-gan-man.  
write-PTCP-1SG  
“I have written.”
- b. Yoz-gan-d-im.  
write-PTCP-PST-1SG  
“I had written.” (Gribanova 2020, p. 8, (8a–b))

In participial constructions, low negation (between *v* and Asp) is permitted (18). Following the participle, it is possible for T to appear as a suffix (18a) or with E-SUPPORT (18b).

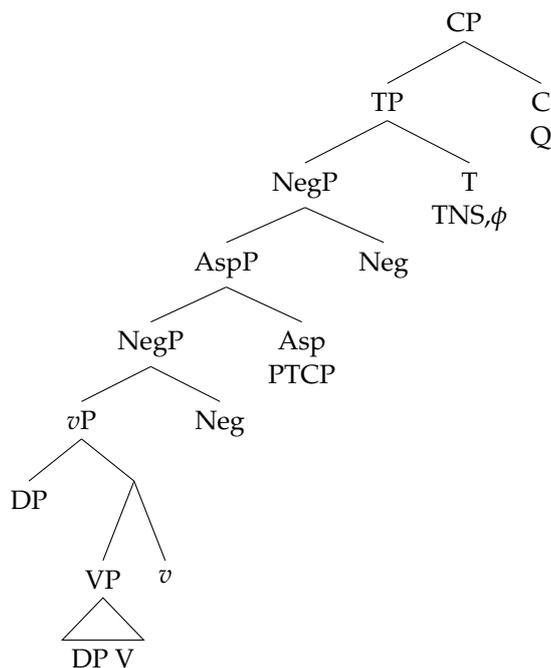
- (18) a. Kitob-ni yoz-ma-gan-d-ingiz.  
book-ACC write-NEG-PTCP-PST-2  
“You hadn’t written the book.” (Gribanova 2020, p. 14, (25a))
- b. Kitob-ni yoz-ma-gan e-d-ingiz.  
book-ACC write-NEG-PTCP E-PST-2  
“You hadn’t written the book.” (Gribanova 2020, p. 14, (26a))

Participial constructions also allow high negation (19). In these cases, NEG and T may optionally occur with E-SUPPORT.<sup>8</sup>

- (19) a. Kitob-ni yoz-gan-mas-d-ingiz.  
book-ACC write-PTCP-NEG-PST-2  
‘You hadn’t written the book.’ (Gribanova 2020, p. 15, (28a))
- b. Kitob-ni yoz-gan e-mas-d-ingiz.  
book-ACC write-PTCP E-NEG-PST-2  
‘You hadn’t written the book.’ (Gribanova 2020, p. 15, (28b))

Gribanova (2020) proposes the structure in (20) for participial constructions. Keep in mind that this ordering is obfuscated in certain environments due to application of Local Dislocation. In environments where Local Dislocation is obligatory, the order in (20) is never observed on the surface.

(20)



Gribanova (2020) suggests that head movement is responsible for unifying all heads up to Asp. However, in the ‘outer’ shell, which is higher than Asp, the hallmarks of non-verbal predication are observed, in which case words are formed via Local Dislocation or with E-SUPPORT.

### 2.2.6. Uzbek Summary

Gribanova (2020) presents data from Uzbek that are similar to the Turkish data discussed by Kornfilt (1996), but offers a slightly different analysis and illustrates that there are some minor differences between languages. Both agree that the most important distinction is between copular and verbal predicates. However, while Kornfilt (1996) assumes that null copulas are responsible for clitic-like behavior of certain morphemes, Gribanova (2020) suggests that the driving force is a combination of categorial properties (verbal versus non-verbal) and whether head movement applies.

Gribanova (2020) suggests that in genuine verbal constructions, head movement unifies all heads from V to C, picking up all intervening heads along the way. In copular constructions, the mapping from syntax to PF relies on either E-SUPPORT or Local Dislocation (or both). Local Dislocation can apply string vacuously, in which case linear order is not affected, or inversion can apply, which reorders two morphemes.<sup>9</sup>

Our analysis of Uyghur will rely on the same mechanisms, but we will show that Uyghur offers insights into how these processes apply and interact that are not made visible in Uzbek.

### 3. Uyghur Suffixes, Clitics, and Auxiliaries

We now turn to Uyghur, where we look at similar configurations to the Turkish and Uzbek cases above. The goal of this section is to account for the three distinct ways in which morphemes are combined into words in Uyghur, shown for the direct past in (21). As discussed by Kornfilt (1996) for Turkish, genuine verbal suffixes in Uyghur, such as the 1SG direct past *dum* in (21a), attracts stress (indicated by italics). In the two subsequent cases, the participle attracts stress. As was the case for Turkish and Uzbek, we provide morpho-syntactic and phonological evidence throughout this section corroborating the fact that each of the cases below involve three different types of word-formation strategies.<sup>10</sup>

- (21) a. Men oqu-d-um.  
1SG read-PST-1SG  
'I read.'
- b. Men oqu-ghan=t-im.  
1SG read-PTCP.PST=PST-1SG  
'I had read.'
- c. Men oqu-ghan i-d-im.  
1SG read-PTCP.PST AUX-PST-1SG  
'I had read.'

In keeping with [Gribanova \(2020\)](#), we assume that the distinct realizations of the direct past arise from three different combinatorial strategies. We take the simple suffix form in (21a) to derive from head movement, the clitic form in (21b) to derive from Local Dislocation, while the form in (21c) involves merging an auxiliary.<sup>11</sup> We deviate from [Gribanova \(2020\)](#)'s analysis in that we take both head movement and auxiliary merger to occur in the narrow syntax, while Local Dislocation takes place in the post-syntactic PF component.

We begin by introducing the phonological diagnostics that we use to distinguish between suffixes, clitics, and auxiliaries throughout the rest of this paper. We suggest that voicing assimilation is fed by head movement, meaning that its (non-)application is informative. Morphemes combined via head movement have the morpho-syntactic restriction that only one morpheme order is possible as well. We further suggest that exceptions to voicing assimilation indicate Local Dislocation, resulting in cliticization.<sup>12</sup> We then show that both suffixes and clitics occur within the same vowel harmony domain as the root, while auxiliaries begin a new prosodic word, and thus a new harmony domain. After introducing these diagnostics, we introduce the core data from all three categories, beginning with suffixation, then turning to cliticization and auxiliaries.

### 3.1. Uyghur Morphophonology

One way in which Uyghur provides greater insight into word-formation strategies is via its phonology. A number of phonological processes are relevant for determining suffix forms. In this section, we will first describe the relevant processes, and then show how their application (or failure to apply) can serve as a diagnostic for word-formation strategies. A full description of these processes is beyond the scope of this paper, but for more detail see [Mayer et al. \(2022a\)](#).

#### 3.1.1. Voicing Assimilation

Initial obstruents in many Uyghur suffixes assimilate to match the voicing of the immediately preceding sound. For example, the past tense marker PST surfaces as *-d* or *-t* depending on whether the final sound in the stem is voiced (22a and 22d) or voiceless (22b and 22c).

- (22) a. Men Tursun-ni kör-d-üm.  
1SG Tursun-ACC see-PST-1SG  
'I saw Tursun.'
- b. Men Tursun-ni ut-t-um.  
1SG Tursun-ACC win-PST-1SG  
'I beat Tursun.'
- c. Men Tursun-ni kes-t-im.  
1SG Tursun-ACC cut-PST-1SG  
'I cut Tursun.'
- d. Men Tursun-ni al-d-im.  
1SG Tursun-ACC take-PST-1SG  
'I took Tursun.'

We will suggest that voicing assimilation only occurs when suffixes are attached using head movement, and thus can serve as a diagnostic for different word-formation strategies. Specifically, in cases where suffixes are attached as clitics, they uniformly surface in their voiceless forms, even when preceded by a voiced sound.<sup>13</sup>

Our specific analysis of voicing assimilation can be represented as the following pair of ordered rules which serve to fill in underspecified feature values. We present a rule-based analysis here for expository purposes, rather than to make any particular theoretical claim. We assume that initial segments in suffixes that undergo voicing assimilation are underspecified for [voice], while suffixes/clitics that never display voicing assimilation (such as the suppositional clitic = *de*) are underlyingly specified for voicing (e.g., Archangeli 1988).

(23) VOICING ASSIMILATION: [ -sonorant ] → [ α voice ] / [ α voice ] – \_.

(24) ELSEWHERE VOICING: [ -sonorant ] → [ - voice ]

The rule in (23) causes suffix-initial underspecified segments to assimilate with preceding material, but only if the preceding material is attached using head movement (indicated by the ‘-’ boundary). The elsewhere condition in (24) fills in a default value of [ - voice ] for any segments still lacking a voice specification (Kiparsky 1973).

### 3.1.2. Vowel Harmony

Vowel harmony in Uyghur has two components: backness harmony and rounding harmony. A simple characterization that is sufficient for our purposes here is that segments in many suffixes are required to agree in backness and/or rounding with the final root vowel. The effects of vowel harmony can also be seen in (22a)–(22d).

In these examples, the 1SG suffix is realized as either *-üim* [-ym], *-um* [-um], or *-im* [-im]. In (22a), the final vowel in the root *ö* /ø/ is front and rounded, and therefore the vowel in the 1SG suffix is realized as *ü* [y]. In (22b), the final vowel in the root *u* /u/ is back and rounded, and therefore the suffix vowel is realized as [u]. In (22c) and (22d), the final vowels *e* /æ/ and *a* /a/ are unrounded and thus the suffix vowel surfaces as *i* [i]. Vowel harmony occurs at the word level, and thus can be used to distinguish between suffixes/clitics, which combine with stems to form a larger word, and auxiliaries, which begin a new word.<sup>14</sup>

Backness harmony affects both high and low vowels<sup>15</sup> while rounding harmony targets only high vowels in most dialects of Uyghur (Mayer et al. 2022a). In addition, rounding harmony typically applies only to *epenthetic vowels* that are inserted to repair syllable structure violations (see Mayer et al. 2022a). This contrasts with suffixes such as the third-person marker *-i*, which surfaces faithfully in this form in all contexts.<sup>16</sup>

Note that, unlike Turkish, backness is not phonemically contrastive for high unrounded vowels in Uyghur. This has two consequences for the harmony system: first, there is no alternation conditioned by backness in cases like (22c) and (22d). Second, /i/ is *transparent* to harmony: it does not impose its own harmonic value on following material, but allows preceding harmonic material to “pass through” it (e.g., *taksi-da*/\**taksi-de* (“taxi-LOC”). For more discussion of the transparency of /i/ to harmony in Uyghur, see Mayer et al. (2022ab); McCollum (2021).

Finally, there are many suffixes in Uyghur that categorically fail to harmonize, and may impose their own harmonic value on following material. These suffixes fall into several broad classes: relativizers, such as the genitive relativizer *-ninki*; most suffixes/clitics that mark person and number on verbs; and a set of suffixes that were historically derived from multi-word constructions. An example of this latter class is the progressive *-wat*, which imposes its own harmonic value on subsequent suffixes, as in *sözlewatqan* (‘she has been speaking’); cf. *sözligen* (‘she has spoken’). A number of other suffixes also fail to harmonize, including the SIMIL suffix *-dek* / *-tek* (as in *tashtek* (‘rock-like’)), which undergoes voicing assimilation but not harmony, and the suffixes discussed in the *u-reduction* section below (though the initial epenthetic vowel in the suffix *-(i)ptu* does harmonize).

A possible phonological analysis of these suffixes, following work like Clements (1976) and Archangeli and Pulleyblank (1989), treats the elements that fail to harmonize as underlyingly specified for the feature [back], while harmonizing elements are underspecified for this feature (e.g., Mayer 2021; Mayer et al. 2022a). Suffixes in the examples in this paper that fail to harmonize with preceding material in the prosodic word may be assumed to fall into this latter category.

### 3.1.3. u-Reduction

Uyghur has a number of vowel reduction processes that generally reduce certain vowels to *i* [i] or *é* [e] when they occur in particular contexts. The relevant process here is *u-reduction*. This process reduces the vowel *u* to *i* in the Q suffix *-mu* (25a and 25b), the 3 suffix *-du* (25c and 25d), and the PST.INDIR suffix *-(i)ptu* (25e and 25f) when they occur in unstressed syllables: this often, though not always, corresponds to word-medial positions.

- (25) a. Siz oqughuchi=mu?  
you student=Q  
'Are you a student?'
- b. Oqughuchi=mi siz  
student=Q 2SG.FML  
'Are you a student?'
- c. Tursun bar-i-du.  
Tursun go-NONPAST-3  
'Tursun will go.'
- d. Tursun bar-i-di=ken.  
Tursun go-NONPAST-3-INFER  
'It seems that Tursun will go.'
- e. Tursun kél-iptu.  
Tursun come-PST.INDIR  
'It seems Tursun came.'
- f. Tursun kél-ipti-ken.  
Tursun come-PST.INDIR-INFER  
'It seems Tursun came (reportedly).'

This process is not productive in the same way as other reduction processes in the language, in that it applies only to these specific morphemes: for example, /bulut-i/ 'cloud-3.POSS' → [buluti], not \*[buliti].

u-reduction does not serve as a diagnostic for any of the word-formation strategies we discuss below, but it is necessary to understand the alternations exhibited in the data.

### 3.1.4. A Note on Stress in Uyghur

The analysis of Turkish in Kornfilt (1996) uses stress as a diagnostic for copular vs. verbal forms, finding that true suffixes attract stress while clitics do not. We intentionally avoid relying on stress as a diagnostic in this paper because of some uncertainty about its manifestation in Uyghur.

Uyghur is typically analyzed as having lexical stress that is sensitive to syllable structure (e.g., Engesæth et al. 2009; Hahn 1991a, 1991b), but the stress system has been described as "remarkable for its complexity and instability" (Nadzhip 1971, p. 63). There is a general tendency for stress to fall word-finally (and thus to move from the root to the suffix as suffixes are added) and on heavy syllables, but there are often exceptions to these generalizations.

Acoustic and perceptual studies (e.g., Major and Mayer forthcoming; McCollum 2020; Yakup 2013; Yakup and Sereno 2016) corroborate this, and suggest that lexical stress is cued primarily by duration. However, Yakup (2013) found that speakers often disagreed as

to which syllables were stressed. This issue is further compounded by other factors that influence duration, such as phrase-final lengthening (see [Major and Mayer forthcoming](#)), which make it unclear in many cases whether increased duration correlates with stress, position in the phrase, or both. This work has generally not focused on stress differences between clitics and suffixes, although [Özçelik \(2015\)](#) suggests that “stress repelling suffixes”, such as many clitics, have underlying foot structure associated with them that necessitates applying a metrical parse that produces non-final stress.

The third author of this paper, GE, a native Uyghur speaker, provided stress judgments for the examples in this paper. These judgments are broadly consistent with the Turkish results from [Kornfilt \(1996\)](#), in that suffixes were more likely to be stressed than clitics. However, GE also found it difficult to produce clear stress judgments in a substantial number of cases.<sup>17</sup>

In light of this uncertainty, we refrain from talking much about stress here, and rely on other diagnostics except in cases where we feel confident in the claims we make. We expect that careful acoustic and perceptual study of stress in cliticized vs. suffixed forms would provide additional evidence to support (or perhaps cast doubt on) aspects of the analysis here, but we leave this as an area for future research.

### 3.2. Suffixation and Head Movement

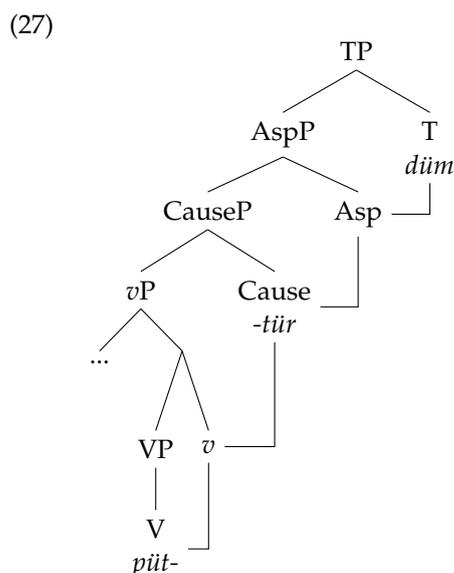
We take suffixation to derive from roll-up head movement, driven by morpho-syntactic features. We assume this process to be equivalent to [Gribanova \(2020\)](#)’s analysis of Uzbek, which was shown in (11a). The only difference is that we suggest head movement takes place in the narrow syntax. We suggest that when possible, head movement is obligatory. The result of head movement is rigid morpheme ordering and strict application of the phonological processes described in Section 3.1. That is, the complex heads formed by head movement constitute a single harmony domain and alternations involving voicing assimilation will be triggered across morpheme boundaries when their conditions are met.

This is exemplified by “genuine” verbal forms like those in (26), where all heads in the verbal complex are unified by head movement. In these cases, the causative and 1SG suffixes both display harmony, and the causative also displays voicing assimilation. The PST suffix also undergoes voicing assimilation here, but the result is the same in both cases.

- (26) a. yaz-dur-d-um  
 write-CAUS-PST-1SG  
 ‘I caused X to write’
- b. püt-tür-d-üm  
 finish-CAUS-PST-1SG  
 ‘I caused X to finish.’

Generally speaking, heads that merge close to the verb are all unified by head movement. We suggest that the fact that harmony transits from the root through agreement tells us that the verbal complex forms a single prosodic word, while the fact that there is voicing assimilation across the junctures tells us that head movement is responsible for unifying the heads. In addition, the morpheme order in both cases in (26) is the only possible morpheme ordering.

Our proposed syntactic analysis of (26b) is provided in (27).



While the presence of harmony can serve as a diagnostic for prosodic wordhood, its absence is less informative, due to the numerous exceptions described in Section 3.1.2. Voicing assimilation, on the other hand, appears to cleave cleanly to the distinction between suffixes and clitics: suffixes beginning in obstruents always assimilate, while clitics never do. Of particular interest are cases where the same morpheme can attach as either a suffix or a clitic, such as the PST suffix *-t/-d-*. In the former case, they consistently undergo voicing assimilation, while in the latter they do not, even when the phonological context suggests they should. We turn to the latter cases in greater detail below.

### 3.3. Auxiliaries and Clitics

There are two other ways in which morphemes are realized that do not involve head movement: cliticization via Local Dislocation (21b) and auxiliary merger (21c). It is often (but not always) the case that both options exist in the same environments. In many ways, the clitic forms appear to be classic cases of *simple clitics*. As mentioned in the introduction, clitics in this paper are enclitics that qualify as what Zwicky (1985) refers to as “simple” clitics, which alternate with strong forms (auxiliaries). We now show that the two options do not have the same distribution, nor do they exhibit the same morphophonological properties.

Beginning with a terminological issue raised by Gribanova (2020), we agree that *e/i-* in Uyghur is not actually responsible for copular predication. For this reason we use “auxiliary” (glossed as AUX) to refer to them in Uyghur. However, we do believe these are elements with verbal properties that merge in the narrow syntax—in this way we deviate from Gribanova’s analysis of the Uzbek equivalent. In essence, our analysis of these elements is equivalent to the copula analysis by Kornfilt (1996) with a minor terminological differentiation. For Uyghur, we suggest that *e/i-* is an auxiliary verb akin to *be/have* in English, which can merge low, where it hosts negation, or high, where it hosts tense/evidentiality. However, before moving to Uyghur, we begin with Chagatay, the language Uyghur and Uzbek are descended from. The reason for this is that Chagatay shows us what these structures looked like when all elements were overt. We use the term “copula” to refer to the Chagatay data in keeping with the literature, but suspect “auxiliary” would be more accurate.

#### 3.3.1. Chagatay Auxiliaries

Chagatay is the historical ancestor of modern Uyghur. Chagatay often (at least optionally) allows for overt auxiliaries in all contexts, whereas the present tense copula has largely been lost in Modern Uyghur and Uzbek. Turning to the Chagatay data in (28), there are two realizations of items treated as copulas: *dur/tur* or *e(r)-*. Eckmann (1966) treats

*dur/tur* as the present tense copula, *e(r)mäs* as the negative copula, and *e(r)di* as the past tense copula, provided, respectively:

- (28) a. Men paadishaah dur-män.  
1SG king AUX-1SG  
"I am a king." (adapted from [Schluessel 2018](#), p. 22)
- b. Men paadishaah e(r)-mäs-män.  
1SG king AUX-NEG-1SG  
"I am not a king." (adapted from [Schluessel 2018](#), p. 22)
- c. Men paadishaah e(r)-d-im.  
1SG king AUX-PST-1SG  
"I was a king." (adapted from [Schluessel 2018](#), p. 22)

One could suggest that the elements above are copular predicates, but even in Chaghatay it is possible for more than one auxiliary to occur in the same sentence. It is unclear whether these elements are implicated in copular predication directly or simply appear in copular environments.<sup>18</sup> Notice that it is possible for one auxiliary to host negation low and another to host tense/agreement high.

- (29) a. Men paadishaah e(r)-mäs e(r)-d-im.  
1SG king AUX-NEG AUX-PST-1SG  
"I was not a king."
- b. Men paadishaah e(r)-mäs tur(-ur)-män.  
1SG king AUX-NEG AUX-PTCP.FUT-1SG  
"I am not a king."

We do not take a strong stance on exactly what these elements are in modern Uyghur. Instead we offer a description of their distribution and evidence that they are indeed verbal elements, essentially equivalent to their Chaghatay counterparts.

### 3.3.2. Auxiliaries in Uyghur

In modern Uyghur, the present tense does not have an overt auxiliary in the affirmative (30a). In the negative present, the auxiliary *e-* obligatorily appears with non-verbal negation (30b), and hosts T in the past tense (30c).<sup>19</sup>

- (30) a. Men oqughuchi.  
1SG student  
"I am a student."
- b. Men oqughuchi e-mes.  
1SG student AUX-NEG  
"I am not a student."
- c. Men oqughuchi i-d-im.  
1SG student AUX-PST-1SG  
"I was a student."

Example (31) shows that, as in Chaghatay, two instances of *i-* are able to co-occur: one hosts negation (*emes*) and the other hosts tense and/or evidentiality (*idim/iken*).

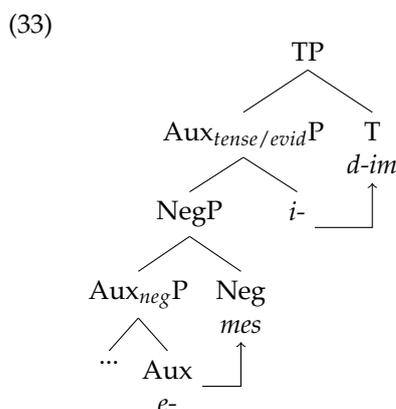
- (31) a. Men oqughuchi e-mes i-d-im.  
1SG student AUX-NEG AUX-PST-1SG  
"I was not a student."
- b. Men oqughuchi e-mes i-ken=men.  
1SG student AUX-NEG AUX-INFER=1SG  
"I am/was not a student (apparently)."

Again, the auxiliary *e/i-* does not appear to be involved directly in copular predication. Instead, it appears in environments where there would otherwise be no verbal element to host negation or tense.<sup>20</sup>

The order of the auxiliaries is fixed, with negation preceding T/Evid:

- (32) a. \* Men oqughuchi i-d-im e-mes.  
 1SG student AUX-PST-1SG AUX-NEG  
 Intended: "I was not a student."
- b. \* Men oqughuchi i-ken=men e-mes.  
 1SG student AUX-INFER=1SG AUX-NEG  
 Intended: "I am/was not a student."
- c. \* Men oqughuchi i-ken e-mes=men.  
 1SG student AUX-INFER AUX-NEG=1SG  
 Intended: "I am/was not a student."

Based on these observations, we take the structure of these auxiliary constructions to be roughly as follows:



Notice that we assume movement of Aux to Neg and also Aux to T.<sup>21</sup> Several facts support head movement: the morphemes are rigidly ordered and the past tense morpheme *-d* undergoes voicing assimilation. In the next section, we will turn to clitic forms, where voicing assimilation does not occur.

### 3.3.3. Clitics in Uyghur

Suffixes and clitics often look identical at first glance. In the case of suffixation in (34), notice that the vowels in the suffixes *-dür* and *-üm* harmonize with the root vowel and the initial consonant in *-dür* agrees in voicing with the preceding sound. As mentioned earlier, we assume vowel harmony to be word bound, as has been argued for Turkish (Fenger 2019, 2020; Kornfilt 1996). Rigid morpheme ordering and voicing assimilation indicate that heads have been unified by head movement in Uyghur.

- (34) Men u-ni kül-dür-d-üm.  
 1SG 3SG-ACC laugh-CAUS-PST-1SG  
 "I made him/her laugh."

Turning to non-verbal constructions, the pattern shifts. When a copular construction occurs in the past tense, the auxiliary strategy is available (35a), as is cliticization (35b). In (35a), the auxiliary *i-* begins a new prosodic word, as evidenced by the fact that it begins a new harmony domain: the agreement suffix *-im* harmonizes with *i*, not the root (*üzüm*). The auxiliary raises to T and triggers voicing assimilation in the *-d* suffix as well.

In (35b), there is no head movement to T, and hence no voicing assimilation of the PST suffix to the final segment in *üzüm*. Unlike the auxiliary construction, the AGR suffix harmonizes with the root, indicating that *üzüm=t-üm* forms a single prosodic word.

- (35) a. Men üzüm i-d-im.  
 1SG grape AUX-PST-1SG  
 'I was a grape.'  
 b. Men üzüm=t-üm.  
 1SG grape=PST-1SG  
 'I was a grape.'

Participial constructions exhibit the same behavior, with the exception that it is impossible to show whether harmony transits through due to the phonological properties of participials in the language.<sup>22</sup> However, it is clear that voicing assimilation (*-d-* vs. *-t-*) occurs in the auxiliary forms (36a)–(36b), but not in the clitic forms (36c)–(36d), suggesting the latter are not created by head movement.

- (36) a. Men oqu-ghan i-d-im.  
 1SG read-PTCP.PST AUX-PST-1SG  
 'I had read.'  
 b. Men ut-qan i-d-im.  
 1SG win-PTCP.PST AUX-PST-1SG  
 'I had won.'  
 c. Men oqu-ghan=t-im.  
 1SG read-PTCP.PST=PST-1SG  
 'I had read.'  
 d. Men ut-qan=t-im.  
 1SG win-PTCP.PST=PST-1SG  
 'I had won.'

The verb raises to Asp, and the participial assimilates in voicing with the final sound of verb root (*gh* [ʁ] is the voiced correspondent of *q* [q]). All morphemes up to the participial are also rigidly ordered (as in (37)). For this reason (following Gribanova (2020)), we assume that the landing site of the verbal complex is Asp in these cases.

- (37) Men Tursun-gha yaz-dur-iwet-ken=t-im/\*d-im.  
 1SG Tursun-DAT write-CAUS-COMPL-PTCP.PST=PST-1SG/PST-1SG  
 'I had completed making Tursun write.'

One final general note is that when head movement is possible, in cases such as (34), it is obligatory. Forms like those in (38) are ungrammatical, because head movement is possible.

- (38) a. \*Men u-ni kül-dür i-d-im.  
 1SG 3SG-ACC laugh-CAUS AUX-PST-1SG  
 "I made him/her laugh."  
 b. \*Men u-ni kül-dür=t-üm.  
 1SG 3SG-ACC laugh-CAUS-PST-1SG  
 "I made him/her laugh."

A reviewer points out that the present analysis requires a prohibition on inserting an auxiliary in (38a). However, to the reviewer's point, we must also prevent Local Dislocation from taking place, as in (38b). As was the case for Gribanova (2020), head movement must occur when it can, which is also reflected in Kornfilt (1996)'s discussion of "genuine" verbal suffixation (she does not model these with head movement). If we take head movement to be driven by a strong verbal feature (e.g., [+V]) on T, when T takes a verbal complement (even V + CAUSE/NEG/ABIL), it forces head movement. We assume that AUX merges only when the complement to T does not contain a verb (the same condition necessary for Local Dislocation). In other words, Aux cannot select for a [+V] complement. In this way, Local Dislocation occurs only when head movement has not occurred and no Aux is merged.

### 3.3.4. More on Auxiliaries and Clitics

Whereas there are never alternations between suffixation and cliticization in the same environment, it is often the case that Local Dislocation and auxiliaries are both possible in the same environments. We show in this section that their distributions overlap, but not entirely. Ultimately, we illustrate that the auxiliary is generally only available when Neg or T would otherwise lack a verbal element as its complement.

There are two common analyses of the behavior of auxiliaries. Under one approach, auxiliaries are lexical items that merge as verbs (Déchaine 1995; Ross 1969) or as functional heads (Adger and Ramchand 2003; Cinque 2006; Tenny 1987). This is in competition with other approaches that propose that auxiliaries are inserted as a last resort mechanism to avoid stranding an affix due to the absence of head movement (Fenger 2019, 2020; Laka 1990). We will present evidence that Uyghur auxiliaries should be analyzed as verbs.

The first argument against *i-* being a post-syntactic last resort mechanism in Uyghur comes from the fact that the clitic strategy is usually available in the same contexts, as shown in (39).

- (39) a. Mahinur oqughuchi=t-i.  
Mahinur student=PST-3  
'Mahinur was a student.'
- b. Mahinur bar-ghan=t-i.  
Mahinur go-PTCP.PST=PST-3  
'Mahinur had left.'
- c. Mahinur oqughuchi i-d-i.  
Mahinur student AUX-PST-3  
'Mahinur was a student.'
- d. Mahinur bar-ghan i-d-i.  
Mahinur go-PTCP.PST AUX-PST-3  
'Mahinur had gone.'

If *i-* is only inserted as a last resort, it is unclear why it would apply in situations where cliticization is possible.<sup>23</sup>

From a theory internal perspective, we have suggested that head movement happens in the narrow syntax. Given that Aux undergoes head movement, as evidenced by its triggering of voicing assimilation, it must be inserted before Local Dislocation applies, and hence it cannot be post-syntactic.

The fact that head movement is obligatory when possible offers an explanation for why forms like *\*i = ti* are not possible. If *i-* is a verb and head movement is obligatory when T Agrees with V within its complement, =*ti* cannot undergo Local Dislocation.

There is also clear evidence that the auxiliary strategy and Local Dislocation are not equivalent processes. In (40), for example, *e-* is obligatory in all four cases, while the higher AUX that hosts temporal morphology is optional. This indicates that the licensing conditions for the lower and higher instances of the auxiliary are not the same: negation obligatorily selects for V, which can be satisfied by the presence of a main verb or an auxiliary, but not by Local Dislocation. T, on the other hand, does not require a verbal complement.

- (40) a. Men oqughuchi \*(e)-mes=t-im.  
1SG student AUX-NEG=PST-1SG  
'I was not a student.'
- b. Men bar-ghan \*(e)-mes=t-im.  
1SG go-PCP.PST AUX-NEG=PST-1SG  
'I had not gone.'
- c. Men oqughuchi \*(e)-mes i-d-im.  
1SG student AUX-NEG AUX-PST-1SG

'I was not a student.'

- d. Men bar-ghan \*(e)-mes i-d-im.  
 1SG go-PCP.PST AUX-NEG PST-1SG  
 'I had not gone.'

The idea that the distribution of auxiliaries is determined by selection is not new. In particular, there are many arguments that T selects for a verbal complement, which can be satisfied by merging an auxiliary into the structure (Arregi and Pietraszko 2021; Cowper 2010; Déchaine 1995; Pietraszko 2017). We propose that Neg requires an overt V within its complement. This can be a lexical V or a complex formed by V (lexical or auxiliary) + aspect, or voice (e.g., causative/passive). We assume that the V feature remains transparent for selection after merging with Asp or Voice, in line with Arregi and Pietraszko (2021). T similarly probes for a V feature and triggers movement of the head containing V, which can be satisfied by a complex head containing a lexical verb or an auxiliary.<sup>24</sup>

In the case of negation, the auxiliary is obligatory, but the auxiliary *i-* that hosts tense is optional. There are some environments where AUX is obligatory to host tense, such as when PST combines with a verb marked the future participle (often called "aorist"):

- (41) Men kél-er {i-d-im, \*=t-im}.  
 1SG come-PTCP.FUT AUX-PST-1SG =PST-1SG  
 'I would come.'

If the clitic form were equivalent to realizing the auxiliary as silent, we should expect both forms to be permitted.

Another distributional property of interest is that there is a single position for the higher auxiliary, which is situated below T. Evidence for this comes from the fact that when more than one evidential is present (*mish* and *ken*), they are able to occur in either order, but only one instance of *i-* is (optionally) available, which obligatorily merges below both evidentials.

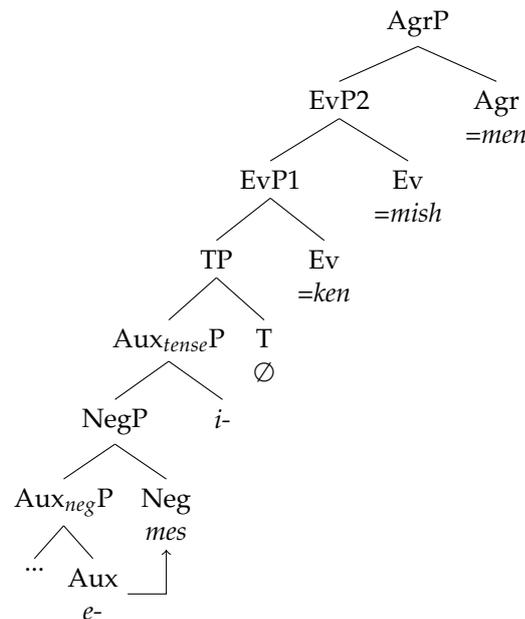
- (42) a. Men oqughuchi (i)-ken (\*i)-mish=men.  
 1SG student AUX-INFER AUX-REP=1SG  
 'I was a student (reportedly).'
- b. Men bar-ghan (i)-ken (\*i)-mish=men.  
 1SG go-PTCP.PST AUX-INFER AUX-REP=1SG  
 'I have gone (apparently).'
- c. Men oqughuchi (i)-mish (\*i)-ken=men.  
 1SG student AUX-REP AUX-INFER=1SG  
 'I was a student (reportedly).'
- d. Men bar-ghan (i)-mish (\*i)-ken=men.  
 1SG go-PTCP.PST AUX-REP AUX-INFER=1SG  
 'I have gone (apparently).'

Given that *ken* itself does not encode tense, but evidentiality, we assume that there is a null T head intervening between it and Aux. This differentiates it from the past tense, where T is overt. Given that T is null, it is difficult to determine whether head movement from Aux to T to Evid takes place. Because =*ken* does not exhibit allomorphy (it neither harmonizes nor undergoes voicing assimilation in any context), we are unable to use phonological diagnostics.

Our analysis of cases like (43a), which contain two auxiliaries and more than one evidential, is provided in (43b).

- (43) a. Men oqughuchi e-mes i-ken=mish=men.  
 1SG student AUX-NEG AUX-INFER=REP=1SG  
 'I was apparently not a student.'

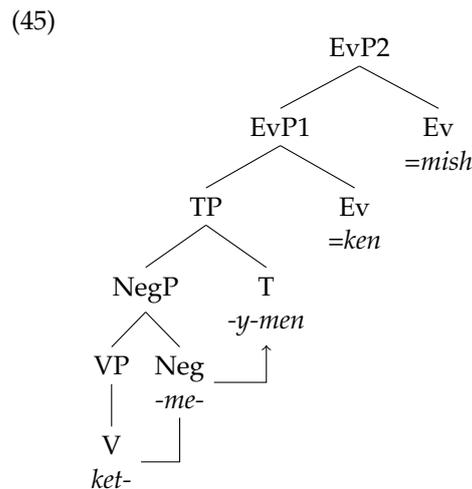
b.



Evidentiality is always encoded by T itself or above T. Because *-d/-* is the direct past in Uyghur, it is incompatible with evidentials. We take this to be a semantic restriction, although it remains possible that a null direct evidential feature is fighting for the same positions as *ken/mish*. It is unclear how one would distinguish between these two options. What is suggested by the structure in (43a) is that both Auxiliary positions are below T. If this is the case, we should not find more than one Aux merged above T, which is shown for both the non-past and the indirect past, respectively, in (44a)–(44b). We take this as evidence that when the verbal complex raises to T (or higher), the auxiliary is no longer available. However, this does not prevent the evidentials from combining with the verbal complex via Local Dislocation.

- (44) a. Men ket-me-y-men                    (\*i)=ken=mish.  
           1SG leave-NEG-NONPST-1SG AUX=INFER=REP  
           ‘I will not leave (apparently).’
- b. Men ket-ma-pti-men                (\*i)=mish=ken.  
           1SG leave-NEG-PST.INDIR-1SG AUX=REP=INFER  
           ‘I didn’t leave (apparently).’

When the complement to overt T is verbal, head movement is obligatory. If the verbal complex rolls up to the head that immediately precedes T, that complex raises to T. When the complement is not verbal, T triggers movement of the auxiliary (as in *i-d-*). We propose the structure below for these verbal constructions that take evidentiality:



We conclude that auxiliaries are inserted when a verbal category is selected by a head in the syntax (e.g., Neg, Evid, T), but its complement is non-verbal or at least not straightforwardly verbal (e.g., participials display mixed nominal and verbal properties, as noted in the descriptive literature (Tömür 2003) and theoretical literature (Asarina 2011)). Auxiliaries undergo head movement like any other verb. Local Dislocation/cliticization occurs in all environments that do not involve head movement, which includes environments where an auxiliary is not merged into the structure. Thus, Local Dislocation applies in all environments where head movement does not, including some environments where an auxiliary is not merged into the structure. This accounts for the overlap.

### 3.3.5. Notes on T and Agr

We should note that the trees in (43b) and (45) suggest that there are two realizations of Agr: one that occurs on T and another that merges higher (AgrP). This may seem stipulative at first glance, but these two positions have different properties. This is distinct from the Turkish and Uzbek works that we build on. This section first offers an explanation for where Agr is (or is not) realized, suggesting it appears only when there is overt T/Evid. We then suggest that Agr obligatorily merges into a high Agr position (above the evidentiality layers) when there is no overt T head.

First, there are some constructions where Agreement is not realized at all. For instance, neither copular constructions (46) nor participial constructions (47) exhibit overt tense or agreement in the present tense.

- (46) a. Men oqughuchi.  
1SG student  
“I am a student.”  
b. Siz oqughuchi.  
2SG.FML student  
“You’re a student.”  
c. Tursun oqughuchi.  
Tursun student  
“Tursun is a student.”

- (47) a. Men ut-qan.  
1SG win-PTCP.PST  
“I have won.”  
b. Siz ut-qan.  
2SG.FML win-PTCP.PST  
“You have won.”

- c. Tursun ut-qan.  
Tursun win-PTCP.PST  
“Tursun has won.”

One could reasonably assume the cases above to be the result of clausal truncation to something smaller than a T, but this is unlikely the solution. For instance, the Q particle *mu* is able to occur without agreement (48), which suggests that both cases constitute full CPs.

- (48) a. Men oqughuchi=mu?  
1SG student=Q  
“Am I a student?”  
b. Men ut-qan=mu?  
1SG win-PTCP.PST=Q  
“Have I won?”

On the other hand, agreement is obligatory when an element in the tense/evidentiality region is merged. For “simple” tenses (49a)–(49b), morpheme order is rigid and T + Agr are inseparable (due to head movement). However, Agr must be overtly realized in copular constructions (49c)–(49d) and participial constructions (49e)–(49f), as well, when tense/evidential morphemes are introduced into the structure

- (49) a. Men ut-i-\*(men).  
1SG win-NONPST-1SG  
“I will win.”  
b. Men ut-t-\*(um).  
1SG win-NONPST-1SG  
“I won.”  
c. Men oqughuchi i-ken=\*(men).  
1SG student AUX-INFER=1SG  
“I was a student (reportedly).”  
d. Men oqughuchi i-d-\*(im).  
1SG student AUX-PST-1SG  
“I was a student.”  
e. Men ut-qan i-ken=\*(men).  
1SG win-PTCP.PST AUX-INFER=1SG  
“I have won (reportedly).”  
f. Men ut-qan i-d-\*(im).  
1SG win-PTCP.PST AUX-PST-1SG  
“I had won.”

The generalization then seems to be that agreement on T is pronounced only if T is overtly realized. However, clitics, which are base generated higher in the structure, are obligatory when T is not overtly realized and possible in focus configurations when T is overtly realized.<sup>25</sup>

Turning to the second issue, agreement merges at different heights depending on whether there is overt tense (50a) or only overt evidentiality (50b). Agreement appears adjacent to T and below the evidentials when T is overt, but following the evidentials when there is no overt T. The higher position is only able to host subject clitics, as shown in (50b).<sup>26</sup>

- (50) a. Siz oqu-y-siz=ken=mish.  
2SG.FML read-NONPST-2SG.FML=INFER=REP  
‘You will read (so they say).’

- b. Siz oqughuchi=ken=mish=siz.  
 2SG.FML student=INFER=REP=2SG.FML  
 ‘You are a student (so they say).’

The descriptive generalization is thus as follows:

- If T or EV is merged, agreement is obligatory.
- If there is an overt T, AGR is realized on T.
- If there is no overt T, AGR merges above EV.

The existence of a higher agreement position is also supported by focus environments where high AGR and agreement on T can be realized simultaneously (51).<sup>27</sup>

- (51) a. Men ket-ken i-d-im=men.  
 1SG leave-PTCP.PST AUX-PST-1SG=1SG  
 ‘I had left! (not someone else)!’
- b. Men ket-i-men=ken=men.  
 1SG leave-NON.PST-1SG=INFER=1SG  
 ‘I will leave (I’m told) (not someone else)!’

This suggests a higher position in the structure to host the subject clitic in emphatic contexts, and the data in (49) suggest that it is not only present, but obligatory when there is EV but no overt T in the structure. This is reminiscent of arguments in favor of a structural split between the position where subject clitics merge and the position for agreement, where the higher position is similar to CliticP (Sportiche 1998). The precise position in Uyghur is obscured by the fact that the language is head-final and thus determining the precise position of heads is not straightforward.

#### 4. Extending the Analysis to More Complex Constructions

To date, we have essentially implemented Gribanova (2020)’s analysis of Uzbek to account for suffixes, clitics, and auxiliaries in Uyghur, introducing minor modifications and introducing diagnostics for each word-formation strategy along the way. In this last section, we illustrate the strengths and weaknesses of our analysis by looking at interrogatives and evidentials. We begin by introducing the precise characterization we assume for Local Dislocation, inversion, and the predictions that this analysis makes.

##### 4.1. Formal Tools and Predictions

We primarily follow Gribanova (2020) in assuming that some words are formed by head movement, some by Local Dislocation, and others by inserting an Auxiliary verb. We suggest one further distinction for the discussion of Uyghur that follows; namely, that we need to differentiate between heads or feature bundles that have been unified via head movement and those that have not. Embick and Noyer (2001) makes a distinction between *M-words* and *Subwords*, which accomplishes almost exactly this, as defined in (52):

- (52) a. M-word: (Potentially complex) head not dominated by further head-projection (cf. Chomsky (1995) “H<sup>0</sup>max”)
- b. Subword: Terminal node within an M-word (i.e., either a Root or a feature bundle)

Gribanova (2020) suggested for Uzbek that inversion under Local Dislocation should be restricted to T and C. We expand upon this by suggesting that Local Dislocation and inversion apply only to M-words, not Subwords. This means that terminals within a complex head derived by head movement are opaque to reordering. We assume that head movement takes place in the narrow syntax, but, as for Gribanova (2020), what is crucial is simply that head movement takes place before Local Dislocation. This could also be accomplished by positing cycles within the phonological component.

The first prediction made is straightforward: heads combined via head movement should completely reflect the syntactic structure (i.e., they should be Mirror Principle compliant). However, complex heads that are not anchored to a verb should be eligible for reordering via Local Dislocation. In other words, Subwords are opaque under our system, meaning that Local Dislocation (repeated in (53)) does not differentiate between M-words and Subwords (i.e., X can stand in for a complex head). This means that inversion can take place between simple and complex heads (but not between heads embedded within a complex head).

- (53) Local Dislocation (as formulated in Kramer 2009):  
 $X * Y \rightarrow X - Y \text{ or } Y - X$

It is unclear what predictions are made by this formalism if we consider a case like (50b), where there are three clitics. If we follow the analysis in this paper in assuming that Local Dislocation applies only to morphemes that are not rolled up in head movement (anchored to a verb), we would expect that all three morphemes would be linked via Local Dislocation and thus each would be subject to inversion, assuming we do not stipulate precisely which morphemes can undergo inversion and which cannot.

One possibility would be to assume that Local Dislocation applies iteratively from left to right, swapping the order of each pair of heads or leaving them in place. Consider the possibilities for the realization of the sequence of heads  $X * Y * Z$ , shown in (54). The order in (54a) can be realized in two different ways: head movement or string vacuous Local Dislocation. Examples (54b)–(54d) can be derived by Local Dislocation, with the specific order dependent on which heads undergo inversion. Examples (54e)–(54f) are not possible under this system, because they are not compatible with left-to-right iterative application.

- (54)  $X * Y * Z$   
 a.  $X - Y - Z$   
 b.  $Y - X - Z$   
 c.  $X - Z - Y$   
 d.  $Y - Z - X$   
 e.  $*Z - X - Y$   
 f.  $*Z - Y - X$

For example, the licit sequence  $Y - Z - X$  is derived via the following steps. We use parentheses to indicate the pair of symbols under consideration at each step:

1.  $(X - Y) - Z$  [swap X and Y and step to the right].
2.  $Y - (X - Z)$  [swap X and Z and step to the right].
3.  $Y - Z - (X)$  [no more pairs left to swap, terminate].

Any additional inversions here (to produce  $Z - Y - X$ , for example) would require backtracking, and are not permitted. Under this system, Local Dislocation does make predictions in contexts where it applies to a sequence of three or more heads. We will pursue this definition of Local Dislocation throughout the rest of this section.

It is also necessary to note that there are certain complex heads that cannot undergo reordering, as shown in (55). The language has no prefixes to our knowledge, so the requirement that lexical items begin a word in Uyghur is supported by the data. All cases of inversion are instances involving functional heads.

- (55) a. Mahinur ket-t-i=mu?  
 Mahinur leave-PST-3=Q  
 ‘Did Mahinur leave?’  
 b. \*Mahinur mu=ket-t-i?  
 Mahinur Q=leave-PST-3  
 ‘Did Mahinur leave?’

Despite the fact that the Q particle is an enclitic (an independent M-word), inversion between Q and the verbal complex (V+v+T+AGR) is not possible. Whether this restriction is best treated as a syntactic constraint on locality (e.g., phases), a prosodic constraint (resist moving heavy things), or some other factor, we leave to future research. For the present, we simply stipulate that certain complex heads (e.g., those containing main verbs) are unable to undergo inversion.

#### 4.2. Analysis of Interrogative Constructions

The distribution of the Q particle is perhaps the most interesting case study for present purposes. In certain cases, particularly in the direct past, the Mirror Principle is essentially obeyed. Our analysis predicts that in these cases the Q particle can only occur at the end of the verbal complex, because the complex is constructed using head movement and cannot be subject to Local Dislocation. This is indeed the case, as shown in (56).

- (56) a. Siz méni kör-d-ingiz=mu?  
2SG.FML 1SG.ACC see-NONPST-2SG.FML=Q  
'Did you see me?'
- b. \*Siz méni kör-mi/mu-d-ingiz?  
2SG.FML 1SG.ACC see-Q-PST-2SG.FML  
Intended: 'Did you see me?'

Our analysis makes different predictions for the clitic and auxiliary forms, repeated in (57). Recall from our analysis of auxiliary constructions that Aux and T+AGR are unified via head movement, resulting in a complex head (a single M-word), while the Q particle is an independent M-word. This is schematized in (58a). The clitic form lacks an Aux (i.e., no *i*, but T and AGR still form a complex head (58b)). Because both cases involve two M-words joined by Local Dislocation, inversion should be possible.

- (57) a. Siz oqu-ghan {i-d-ingiz, =t-ingiz}=mu?  
2SG.FML read-PTCP.PST {AUX-PST-2SG.FML, =PST-2SG.FML}=Q  
'Had you read?'
- b. Siz oqughuchi {i-d-ingiz, =t-ingiz}=mu?  
2SG.FML student {AUX-PST-2SG.FML, =PST-2SG.FML}=Q  
'Are you a student?'
- (58) a. [AUX-[T]]= [Q]  
b. [T]=[Q]

Inversion is indeed possible in cliticized forms, as predicted by our account. Examples of this are shown of inversion between =*tingiz* (T+AGR) and *mu* (Q) for both participial constructions (59) and copular constructions (60).<sup>28</sup>

- (59) a. Siz oqu-ghan=[t-ingiz]=[mu]?  
2SG.FML read-PTCP.PST=PST-2SG.FML=Q  
'Had you read?'
- b. Siz oqu-ghan=[mi]=[t-ingiz]?  
2SG.FML read-PTCP.PST=Q=PST-2SG.FML  
'Had you read?'
- (60) a. Siz oqughuchi=[t-ingiz]=[mu]?  
2SG.FML student=PST-2SG.FML=Q  
'Were you a student?'
- b. Siz oqughuchi=[mi]=[t-ingiz]?  
2SG.FML student-Q=PST-2SG.FML  
'Had you read?'

The predictions of our analysis are less clear for auxiliary constructions. Recall from Section 4.1 that complex heads containing main verbs cannot undergo inversion. It is unclear a priori whether auxiliaries should behave like lexical verbs in this respect. If auxiliaries are different from lexical verbs, inversion could be possible between clitics/auxiliaries and Q. If auxiliaries are like main verbs, in that they are unable to undergo inversion, only clitics should allow inversion.

Inversion is indeed possible with clitics, as shown in (61). Interpreting the data is confounded by the fact that non-final Q is realized as =mi= and the auxiliary begins with *i-*. This produces vowel hiatus (the sequence mi=i), which is repaired by vowel deletion (see Major and Mayer (forthcoming) for some additional discussion of vowel deletion). Since the vowels are identical, it is impossible to say which one remains. However, the fact that voicing assimilation occurs in the *-d* suffix suggests that the final vowel of =mi= deletes while the auxiliary is present and raises to T. This is because voicing assimilation only occurs when morphemes are combined via head movement. Otherwise we would expect the voiceless allomorph.

- (61) a. Siz oqu-ghan m=[i-d-ingiz]?  
2SG.FML read-PTCP.PST Q=AUX-PST-2SG.FML  
'Had you read?'
- b. Siz oqughuchi m=[i-d-ingiz]?  
2SG.FML student Q=AUX-PST-2SG.FML  
'Were you a student?'

We therefore conclude that auxiliaries are not prohibited from undergoing inversion under Local Dislocation, unlike main verbs. For this reason, both orders involving the Q particle are permitted.<sup>29</sup>

The cases above are straightforwardly captured by our proposal, but things get far more complex as we look at present and non-past configurations. First, recall that the Q particle can combine directly with a predicate nominal or a participial, as in (62).

- (62) a. Siz oqughuchi=mu?  
2SG.FML student=Q  
'Are you a student?'
- b. Siz oqu-ghan=mu?  
2SG.FML read-PTCP.PST=Q  
'Have you studied?'

There are a number of questions about what the Q particle combines with and how. We have proposed that the Q particle always combines via Local Dislocation, but it is also possible that Q is able to interact with a null copula or null T head. Kornfilt (1996) explicitly argues that such null copulas are able to be inflected with TAM markers, evidentials, and agreement morphology. With respect to inversion, one might expect that a null copula could undergo inversion with Q, despite being string vacuous.

Whereas Uyghur and Uzbek do not exhibit an overt present tense copula, Chagatay does (*dur/tur*). Eckmann (1966) discusses the fact that in early Chagatay, the copula was inflected for tense (*dur-ur*). Over time, the T inflection (*-ur*) was dropped and eventually *dur/tur* as well. However, for present purposes, we can use Chagatay to at least inform where these null copulas or tense-marking could be observed in Modern Uyghur.

- (63) a. qil-ma-gan dur  
do-NEG-PTCP.PST COP  
'Didn't do'
- b. qil-gan e(r)-mäs tur  
do-PTCP.PST COP-NEG COP  
'Didn't do'

Example (63) shows two realizations of the phrase “didn’t do” in Chagatay. Notice in (63b), T occurs following the negative auxiliary. If we assume this element to be syntactically present but covert in Modern Uyghur, it changes the ordering possibilities predicted to be acceptable under the present approach. For instance, if we consider the negative copular questions in (64), one might predict that inversion between the Q particle and the negative auxiliary should be possible, as was the case with the auxiliaries inflected for T in (61).

- (64) a. Siz oqughuchi e-mes=mu?  
2SG.FML student AUX-NEG=Q  
'Aren't you a student?'
- b. Siz oqu-ghan e-mes=mu?  
2SG.FML read-PTCP.PST AUX-NEG=Q  
'Haven't you studied?'

Whereas the uninverted form is fine above, the inverted form is ungrammatical (65).

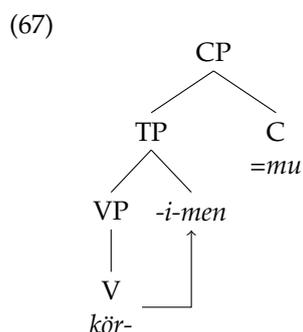
- (65) a. \*Siz oqughuchi mi/mu/m=e-mes?  
2SG.FML student Q/Q/Q=AUX-NEG  
Intended: 'Aren't you a student?'
- b. \*Siz oqu-ghan mi/mu/m=e-mes  
2SG.FML read-PTCP.PST Q/Q/Q=AUX-NEG  
Intended: 'Haven't you studied?'

If we assume that there is a null equivalent to *dur(ur)* between the negative copula and =*mu*, string-vacuous inversion of the Q particle and silent *durur* would be possible, as was the case between the Q particle and the overt past tense forms in (59), (60), and (61). However, assuming that the Q particle merges above T, it could invert with the null copula, but could not undergo subsequent inversion with the negative copula, because it would involve the prohibited Z X Y order.

The distribution of Q particles in the non-past presents an interesting puzzle. Notice in (66a), that Q particle loses its vowel (-*em*) and precedes agreement, while in (66b) it follows it. Interestingly, the former is the more natural form, despite the fact that it appears to involve inversion.

- (66) a. Siz meni kör-em-siz?  
2SG.FML 1SG.ACC see-NONPST.Q-2SG.FML  
'Will you see me?'
- b. ?Siz meni kör-i-siz=mu?  
2SG.FML 1SG.ACC see-NONPST-2SG.FML=Q  
'Will you see me?'

At first glance, it appears that our analysis offers a straightforward account of this contrast. If we assume that the output of the narrow syntax is as shown in (67), one might suggest that the only difference in (66) arises from inversion between T and Q, identical to what [Gribanova \(2020\)](#) proposes for Uzbek.<sup>30</sup>



The intuitive approach to this data would be to treat *-em* in (66a) as a portmanteau that realizes both T + Q features. In this case, we would have to claim that the same is true of *m* in cases where the verb root ends in a vowel, such as (68).

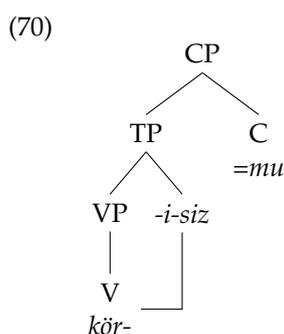
- (68) Siz        méni    tonu-m-siz?  
 2SG.FML 1SG.ACC know-NON.PST-Q-2SG.FML  
 ‘Do you know me?’

However, there are data to suggest that the *a/e/o* alternation we find preceding *=m* is not actually the non-past or present tense. For instance, it is possible to cliticize the past tense to *=m*, which would lead to a contradiction if the non-past/present is contained within *am/em*. This is shown in (69a), where the Q particle precedes *=tingiz*.<sup>31</sup> However, the past tense is incompatible with the non-past regardless of where the Q particle resides, as shown in (69b)–(69c).

- (69) a. Siz        méni    kör-e=m=t-ingiz?  
 2SG.FML 1SG.ACC see-ASP=Q=PST-2SG.FML  
 ‘Would you have seen me?’  
 b. \*Siz        méni    kör-i-siz=t-ingiz=mu?  
 2SG.FML 1SG.ACC see-ASP=PST-2SG.FML=Q  
 Intended: ‘Would you have seen me?’  
 c. \*Siz        méni    kör-i-siz=mi=t-ingiz?  
 2SG.FML 1SG.ACC see-ASP=Q=PST-2SG.FML  
 Intended: ‘Would you have seen me?’

For this reason, we argue that the alternation we began with in (66) is not a matter of inversion; instead, we suggest that the two interrogatives have radically different syntactic structures.

We assume that simple, but dispreferred, non-past interrogatives involve straightforward derivations which obey the Mirror Principle, resulting from head movement to T. In these cases, the complex head containing the main verb is incompatible with inversion, as in (70).



*-em/-am/-m* constructions are more complicated. The fact that *em* constructions are compatible with the past tense is highly suggestive that *-(a/e)m* does not itself contain tense. This is supported by data from Chagatay, where we see that *-a/-e* is actually a gerundive/converbial marker that is followed by a copula. This marker (roughly) encodes imperfectivity, not tense. As shown in (71), this element is followed by the present tense copula *dur*, which does encode tense (recall the discussion of *durur*).

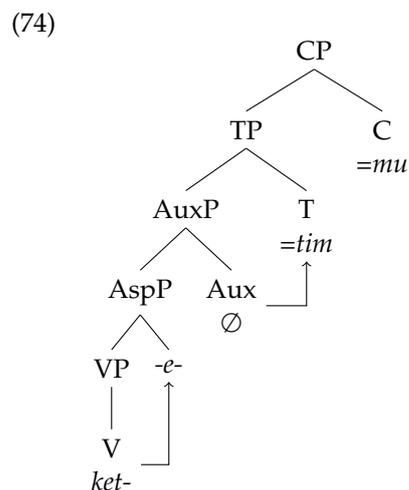
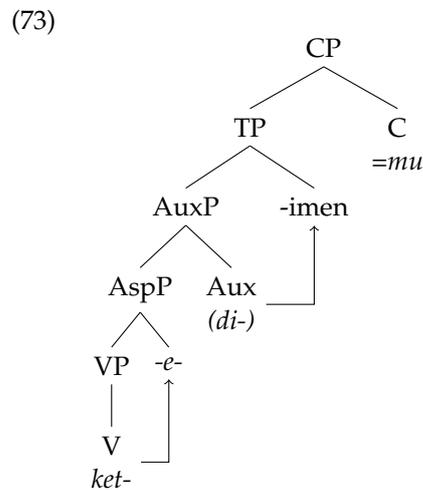
- (71) a. öl-ä        dur men  
 die-CNV AUX 1SG  
 ‘I (will) die’ (Eckmann 1966, p. 94)  
 b. de-y        dur men  
 say-CNV AUX 1SG  
 ‘I (will) say’ (Eckmann 1966, p. 174)

- c. tap-a dur men  
 find-CNV AUX 1SG  
 'I (will) find' (Eckmann 1966, p. 174)

Again, if we assume the Chagatay data to reveal the position of T in modern Uyghur, the difference between the forms in (66) is as follows: the *-em/-am/-m* form does not contain overt tense, while *-i/-y* are truly tense markers. The syntax is such that *-a/-e* combines directly with the verb below T, not unlike participials—we take this element to also be an aspectual head. This aspectual head harmonizes with the root, then the copula (silent *dur*) merges into the structure, which begins a new word and hosts tense/agreement/evidential morphology. Interestingly, remnants of this copula remain in first-person forms (as *-di*), even in modern Uyghur.<sup>32</sup>

- (72) a. Men ket-e=m\*(di)-men?  
 1SG leave-NONPST.Q-AUX-1SG  
 "Will I leave?"
- b. Biz ket-e=m\*(di)-miz?  
 1PL leave-NONPST.Q-AUX-1PL  
 "Will we leave?"

We conclude that *dur* is silent in non-first-person cases, but syntactically present. The first-person forms reveal the position that tense merges in the spine, which aligns with what we find in Chagatay. This means that the present and past tense forms have the same syntactic structures, differing only in that the past tense clitic =*t-* is overt, while the non-past marker is silent. We propose the structures in (73) for the non-past and (74) for the past.



In both derivations above, the result of head movement is a complex that consists of (Aux)-T, not unlike clitic forms following participials. Also like participial constructions, Q is able to undergo inversion with the clitic. This is entirely compatible with the proposal above. What still requires an answer is why Q must obligatorily invert with the clitic in these cases, as illustrated by the contrast in (75).

- (75) a. Men ket-e=m=t-im?  
1SG leave-ASP=Q=PST-1SG  
'Had I left?'
- b. \*Men ket-e=t-im=mu?  
1SG leave-CNV=PST-1SG=Q  
Intended: 'Had I left?'

Aside from the peculiar fact that inversion is obligatory in precisely these cases, Local Dislocation is sufficient to account for the data in this section. We now complicate things by introducing evidentiality back into the mix.<sup>33</sup>

#### 4.3. Introducing Evidentials

The previous section concluded that the present analysis is able to handle a wide range of interrogative constructions. This section introduces evidentials =*ken* and =*mish* back into the conversation, which presents new difficulties. These difficulties arise from multiple factors: (i) grammaticality judgments are difficult for speakers, (ii) establishing the morpheme order generated by the syntax is difficult, and (iii) the predictions made by our analysis are unclear due to factors (i–ii).

Beginning with the simplest case where the verbal complex raises to T, which realizes tense and agreement, both the evidential and the Q particle combine via Local Dislocation and are able to undergo optional inversion. This follows straightforwardly from our proposal, as there is only a single instance of inversion that takes place.

- (76) a. Men k et-i-men=mi=ken.  
1SG leave-NONPST-1SG=Q-INFER  
'Will I (really) leave?'
- b. Men k et-i-men=ken=mu.  
1SG leave-NONPST-1SG=INFER=Q  
'Will I (really) leave?'

This is the same pattern we observed when we first introduced alternations between *mish* and *ken* in (44), which similarly involved a single instance of inversion between two adjacent heads combined via Local Dislocation.

Recall that in constructions lacking overt T, such as participial and copular constructions, AGR merges as a high clitic above both *ken* and *mish*. This is shown again in (77).<sup>34</sup>

- (77) a. Men oqughuchi=ken=mish=men.  
1SG student=INFER=REP=1SG  
'I was apparently a student.'
- b. Men oqu-ghan=ken=mish=men.  
1SG study-PTCP.PST=INFER=REP=1SG  
'I have apparently read.'

The order provided in (77) is accepted by all speakers as the most natural morpheme order. We suggested in (43b) that this is the morpheme order generated by the syntax. However, because the evidentials and Agr are not unified by head movement, they are able to undergo inversion.

The cases in (78) are all cases that are predicted to be possible by our proposal and are also confirmed to be grammatical by our speakers. These are both cases where only one instance of inversion takes place (*men* and *mish* or *mish* and *ken*).

- (78) a. Men oqughuchi=ken=men=mish.  
1SG student=INFER=1SG=REP  
'I was apparently a student.'
- b. Men oqu-ghan=ken=men=mish.  
1SG study-PTCP.PST=INFER=1SG=REP  
'I have apparently read.'
- c. Men oqughuchi=mish=ken=men.  
1SG student=REP=INFER=1SG  
'I was apparently a student.'
- d. Men oqu-ghan=mish=ken=men.  
1SG study-PTCP.PST=REP=INFER=1SG  
'I have apparently read.'

If we assume that the highest of the three dislocated heads is Agr, the only orders predicted to be ungrammatical are those that begin with =*men*, (i.e., ZXY or ZYX orders). These are universally rejected by our speakers, which offers support for our proposal.

- (79) a. \*Men oqughuchi=men=ken=mish.  
1SG student=1SG=INFER=REP  
Intended: 'I was apparently a student.'
- b. \*Men oqu-ghan=men=ken=mish.  
1SG study-PTCP.PST=1SG=INFER=REP  
Intended: 'I have apparently read.'

However, speakers also vary considerably with respect to the acceptability of the cases in (80), which should be acceptable based on our proposal as currently spelled out.

- (80) a. % Men oqughuchi=mish=men=ken.  
1SG student=REP=1SG=INFER  
'I was apparently a student.'
- b. % Men oqu-ghan=mish=men=ken.  
1SG study-PTCP.PST=REP=1SG=INFER  
'I have apparently read.'

Given that many speakers do not have clear or consistent judgments about the grammaticality of the cases in (80), it is difficult to determine how to interpret the results or evaluate the predictions made by our account. The same variation in acceptability judgments arises when we look at the behavior of the Q particle in evidential contexts.

Example (81) demonstrates the ordering possibilities between the Q particle, *ken*, and *men*. Example (81a) is the most natural order according to all speakers, (81b) is judged as grammatical by all speakers, while (81c)–(81d) are ruled out as ungrammatical by all.

- (81) a. Men oqughuchi=mi=ken=men?  
1SG student=Q=INFER=1SG  
'Was I a student?'
- b. Men oqughuchi=ken=men=mu?  
1SG student=INFER=1SG=Q  
'Was I a student?'
- c. \*Men oqughuchi=ken=mi=men?  
1SG student=INFER=Q=1SG  
'Was I a student?'
- d. \*Men oqughuchi=men=ken=mu?  
1SG student=1SG=INFER=Q  
'Was I a student?'

However, if the 1SG marker *men* is swapped with the 2SG marker *siz*, all speakers maintain the overall same preferences, but some speakers find (82c)–(82d) marginally acceptable.

- (82) a. Siz oqughuchi=mi=ken=siz?  
2SG.FML student=Q=INFER=2SG.FML  
'Was I a student?'
- b. Siz oqughuchi=ken=siz=mu?  
2SG student=INFER=2SG.FML=Q  
'Was I a student?'
- c. % Siz oqughuchi=ken=mi=siz?  
2SG.FML student=INFER=Q=2SG.FML  
'Was I a student?'
- d. % Siz oqughuchi=siz=ken=mu?  
2SG.FML student=2SG.FML=INFER=Q  
'Was I a student?'

Again, without crisp judgments for these forms, it is difficult to conclude exactly how to interpret these data. One would need to find a way to clearly differentiate between grammaticality and acceptability in such cases. For this reason, it seems we cannot really evaluate the constraint on ZXY/ZYX.

## 5. Discussion

Our analysis accounts for the majority of the Uyghur data presented in this paper. We have shown that head movement precedes all PF operations, because it blocks auxiliary insertion and also prevents heads contained within a complex head from undergoing inversion. We suggest this happens in the narrow syntax, which is why head movement must occur in all contexts where it can. This would be compatible with [Gribanova \(2020\)](#)'s suggestion that head movement happens at an earlier stage at PF, but this requires that PF operations apply in cycles, which we choose not to commit to. In addition to strict morpheme ordering as a diagnostic for head movement, we illustrate that the application of certain phonological processes can also serve as a diagnostic. We further provide evidence for maintaining a formal contrast between M-words and Subwords, by which heads unified by head movement (Subwords) are unable to undergo inversion internal to the complex head or with an M-word (a head not unified with it by head movement). Finally, whereas [Gribanova \(2020\)](#) only needs inversion to apply between T and C, we demonstrate that it is a more general factor between consecutive elements that combine via Local Dislocation.

Where this analysis runs into potential problems is in determining exactly when inversion is or is not permitted. We introduced a way of implementing Local Dislocation as an iterative system, which is proven necessary by Uyghur clitics, but it is unclear whether this analysis actually predicts the observed patterns. What is clear in our data is that a distinction needs to be made between rigidly ordered morphemes, which we suggest combine via roll-up head movement, and simple clitics that lean leftward, which show variable ordering. Even for clitics, in most cases, speakers show a preference for the Mirror-Principle-abiding order, with the exception of non-past questions.

Moving forward, from an empirical perspective, we hope to expand the morphemes that are part of this investigation. From a theoretical perspective, we have been considering alternatives that involve different types of interactions between modules of the grammar. For instance, we can maintain from the current study that head movement is a narrow syntactic process that yields phonotactically well-behaved strings with rigid morpheme ordering, while exploring alternative explanations for morphemes not concatenated via head movement. One possibility is that PF re-ordering is strictly an optimization process ([Prince and Smolensky 1993](#)), similar to the morphological investigation in [Haugen \(2006\)](#). If this were the case, we should find that phonological factors condition ordering, similar to findings on N-Adj ordering in Tagalog ([Shih and Zuraw 2017](#)). If this were the case in

Uyghur, we would expect to find that re-ordering results in a more optimal phonological output. More specifically, our current thoughts are as follows: the candidate set includes all morpheme orders excluding those that have been rolled up in head movement by the verb. In this way, all orders are possible (in principle) for the clitics in (82). However, if we take violating the output of the syntax to be punished, re-ordering comes at a cost. More specifically, re-ordering will only be permitted if it provides some phonological or prosodic benefit. This would predict both that the non-inverted forms are the most preferred, and that increasing the number of inversions decreases acceptability. In ongoing research, we are investigating ways in which we might evaluate what is gained from inversion, which is a necessary step in determining whether this is the right way to approach this puzzle. Under such an analysis, violations to the Mirror Principle (i.e., inversion) are expected more frequently in contexts where something is gained. Ideally, the “gains” would align with preferences exhibited by the phonological/prosodic grammar more broadly.

## 6. Conclusions

This paper has expanded the prior literature on Turkic word-formation strategies in Turkish (Kornfilt 1996; Yu and Good 2000) and Uzbek (Gribanova 2020) to include Uyghur. Building on these analyses and expanding the number of constructions under investigation, we have offered an analysis that differentiates between suffixes, clitics, and auxiliaries in Uyghur. We have provided diagnostics for head movement in Uyghur and shown that true verbal suffixes are derived from head movement. In addition, we have shown that Uyghur, like Turkish and Uzbek, has an alternative strategy for constructing words, following the observations in Kornfilt (1996) and Gribanova (2020). We follow Gribanova (2020) in analyzing this as Local Dislocation. We suggest that this results in clitic-like behavior, which optionally allows inversion. We restrict inversion to two heads, making use of the distinction in Embick and Noyer (2001) between M-words and Subwords, suggesting that Subwords are never able to undergo inversion, while complex heads can. We also offer an explanation for the environments where Local Dislocation takes place relative to head movement. Moreover, this paper offers a substantial look into the morphological system of Uyghur, which is of value for both descriptive reasons, as well as setting the stage for more comprehensive investigation of the morphological system moving forward.

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## Abbreviations

The following abbreviations are used in this manuscript and do not correspond to Leipzig Glossing Conventions:

FML	formal
INDIR	indirect past
INFER	inferential evidentiality
REP	reportative evidentiality
Q	question

## Notes

- 1 We attempt to maintain terminology consistent with Kornfilt (1996)'s discussion of Turkish (*i-* is a copular) and Gribanova (2020)'s discussion of Uzbek (*e-* is an auxiliary like element), and Eckmann (1966)'s discussion of Chagatay (copula). In Uyghur, we use "auxiliary", because it does not seem to consistently be required for copular predication, but is consistently required to host negative or tense morphology. In Section 2, we present the data as analyzed by the cited authors, even when incompatible with our analysis of Uyghur. This is because we cannot make claims about Uzbek on the basis of Uyghur, regardless of how similar the elements look on the surface.
- 2 The copula never intervenes between a verb and a participle, but always intervenes between an adjective and the participle. The copula has different functions depending on the environment: it verbalizes an adjective, making it a satisfactory host for verbal morphology. Verbs are able to host verbal morphology (i.e., participles) and the auxiliary is inserted only to host tense/evidential morphology in such cases.
- 3 See Kornfilt (1996) for the entire comprehensive discussion of stress.
- 4 Yu and Good (2000) present a diachronic argument for a similar analysis, suggesting that genuine verbal forms take true suffixes, while the copular forms are followed by enclitics.
- 5 If we assume that T must combine with something verbal in Uzbek, one option of which is the auxiliary *e-*, it might explain the Uzbek pattern. If we take this element to be verbal, contra Gribanova, the fact that *e-* in *emas* is verbal, it is possible for T to find a verbal feature within its complement. This is the approach we take for Uyghur.
- 6 The logic is that an element that is directly responsible for copular predication should appear only once in a copular construction.
- 7 It is unclear whether this inversion is obligatory or not, since (14d) is acceptable. Given the optionality of inversion in other places, we do not see why the Q particle in final position would not be marginally acceptable, as well.
- 8 The orders in (19) are available in Uzbek and Uyghur, but not Turkish. Turkish non-verbal negation (*değil* is never preceded by *i-*).
- 9 Two reviewers point out the fact that string vacuous Local Dislocation seems redundant. Although this is true, this formalization better represents the option to invert in cases where doing nothing is possible.
- 10 There are a number of morphemes that alternate between suffixes, clitics, and auxiliaries that are central to the rest of this paper, which we summarize here. Clitics are indicated by =, suffixes by -. INFER: {*iken*, =*ken*}, REP {*imish*, *mish*}, PST: {-*D-*, *id-*, =*t-*}, Q: {=*mu*, =*mi*, =*m*}, 1SG {-*(I)m*, =*men*, =*men*}, 2SG.FML: {-*ingiz*, =*siz*, =*siz*} (the same is true for all other persons and numbers), NEG: {-*mi*, =*mes*}.
- 11 A reviewer questions whether a separate mechanism is necessary to derive (21b). Given that inversion is possible in such environments and the voicing assimilation does not occur, something different from head movement is happening that does not result in rigid ordering and produces apparent exceptions to the phonotactic rules found in cases of standard suffixation. We use Local Dislocation primarily out of convenience. We could just as easily call this operation GLOM, which takes an independent morpheme and gloms it onto whatever appears to its left. We would also need morphemes that attach via GLOM to be subject to re-ordering. This is precisely what we are using Local Dislocation to do in this section.
- 12 A reviewer suggests that because voicing assimilation does occur in Turkish that it could be construed as informative with respect to what is happening in Uyghur. We suggest that opposite is the case - this juncture is not as tight as those that involve genuine verbal forms (perhaps head movement) in all three languages and Uyghur shows us an additional piece of evidence that this juncture is looser (i.e., the absence of voicing assimilation).
- 13 We note anecdotally that vowel hiatus resolution (repairing sequences of adjacent vowels) may also serve as a diagnostic for head movement (i.e., applies only when head movement has taken place). If this were proven correct, it would allow us to test a wider range of morpheme boundaries. The most commonly applied strategies in Uyghur are vowel deletion and glottal stop insertion. Two additional strategies are less commonly used. The first is vowel gliding, where a *V-i* sequence is realized as *V-y*, as in the non-past suffix *-i-* being realized as *-y-* in *Men Tursun-din sora-y-men* ("I will ask Tursun") (cf. *Men Tursun-ni kör-i-men* ("I will see Tursun")). The second is glide insertion, which is used when the abilitative suffix *-ala-/-ele-* is attached to vowel-final roots, as in *sözli-yele-y-du* ("She can speak") (cf. *kél-ele-y-du* ("She can come")). We leave this as an area for future investigation.
- 14 Note that in other languages, like Yoruba, suffixes undergo harmony while clitics do not (Archangeli and Pulleyblank 1989).
- 15 Mid vowels almost never occur in suffixes, and the suffixes they do occur in, such as *-xor* ('eater') (as in *göshxor* ('carnivore (lit. meat eater)')) do not harmonize.
- 16 We assume that the initial vowel in the 1SG suffix in the examples above is epenthetic, although this suffix never attaches to vowel-final stems to our knowledge. This assumption is made based on the harmonizing behavior of this vowel, which is similar to clearly epenthetic vowels in other contexts: for example, the phonologically identical 1SG.POS suffix *-m*, which surfaces as *-m* when it attaches to a vowel-final stem, but *-im/-üm/-um* when it attaches to a consonant-final stem.
- 17 A reviewer notes that if it is indeed the case the clitics are extra metrical in Uyghur (in the sense that they cannot host stress), there is a surprising asymmetry between a 'word' for the purposes of vowel harmony (which includes clitics) and a 'word' for the purposes of stress (which does not). In the absence of a clear picture of stress in these contexts, we refrain from much speculation here. We do note, however, that this would align the domain of stress with the domain of voicing assimilation, which similarly fails to apply to clitics.

- 18 This is similar to English “be” (e.g., “Derrick *is being* mean”), where multiple instances occur and neither instance is necessarily responsible for copular predication.
- 19 This auxiliary is usually realized as *i* in Uyghur, except when it hosts negation, where it is realized as *e*. The general change from *e* in Chaghatay to *i* in Uyghur is likely to be related to development of the pervasive vowel raising processes in modern Uyghur (see Section 3.1.3), but it is unclear why this has not occurred in negation contexts. We leave this as an open question, but assume that *e* and *i* are allomorphs of the same auxiliary, as was the case in Chaghatay.
- 20 As an anonymous reviewer points out, throughout the rest of the paper we describe *ken* as an evidential marker lacking tense. The same is true here, where tense is encoded by *-d-* in (31a), while it is null in (31b). *-ken* only introduces evidentiality here. The *-d-* form is incompatible with a temporal adverb like *hazir* (“now”), while *iken* is. In other words, *iken* is compatible with present and past temporal adverbs.
- 21 It remains possible that there is an independent AGR projection, but we place AGR features on T. We are unaware of any unintended consequences of this decision.
- 22 As described in Section 3.1, backness is not contrastive for high unrounded vowels. Because participials only contain unrounded low vowels, the AGR suffix is realized as *-im* regardless of whether the participial appears in its front or back form.
- 23 An anonymous reviewer points out that the strength of this argument is dependent on the difference between cliticization and suffixation being derivationally determined. If we treated suffixes and clitics as two entirely distinct lexical items, one could simply claim that only suffixes trigger Aux insertion. Given that this alternation applies to an entire class of items, it would require that all elements that combine with an auxiliary have both an auxiliary form and a clitic form. Making this choice would result in it being a coincidence that precisely this class of items that merge in the same region have two distinct realizations. The derivational approach gives us a way of generalizing across the class of items. We take this fact to favor the derivational approach, but we admit that this requires a careful, systematic investigation, which goes beyond the scope of this paper.
- 24 In a case like (40b), head movement is blocked and no auxiliary is inserted, which requires explanation. One possibility is that there is a silent auxiliary (similar to Kornfilt’s analysis) that satisfies this requirement and we simply do not see it overtly (i.e., a silent version of *i-* in (40d)). Another possibility is that T finds the verbal feature in *emes*, but somehow is unable to undergo head movement. A final option is that T cannot see V within *emes*, the derivation does not fail as a result, and Local Dislocation is a rescue strategy that allows T to cliticize to its left. We leave the precise answer to future research.
- 25 We thank an anonymous reviewer for suggesting this solution, which was far simpler than our previous analysis.
- 26 As pointed out by a reviewer, Turkish requires agreement in these contexts. We do not have a meaningful explanation with respect to the source of these differences.
- 27 The realization of AGR in the higher position introduces contrastive focus on the subject.
- 28 Recall from Section 3.1.3 that the alternation between *mu* and *mi* is purely phonological.
- 29 An anonymous reviewer asks whether the entire string *midingiz* cliticizes to *oqughan* and *oqughuchi*, respectively. If our analysis is on the right track, an auxiliary is present in these cases, in which case these strings would form independent prosodic words. Further diagnosis is necessary to show conclusively that this is the case, as opposed to the reviewers suggestion.
- 30 It is unclear why the final vowel of *mi/mu* is lost in this construction. We leave this as an open question.
- 31 The past tense in configurations like (69a) behaves more like the past tense on modals in English than the true past tense. We leave the precise semantics to future research.
- 32 The Q particle often occurs to the left of AGR in Chaghatay, but to the right of the converb/gerundive marker, modals, and mood (i.e., it occurs between the optative and AGR markers) in cases like *...tarcama qil-a al-gay mu men?* ...translation do-CNV ABIL-OPT Q 1SG “Will I be able to translate...?” (Eckmann 1966, p. 143).
- 33 One could argue that the reduced *=m-* form of the Q particle is base generated lower in the structure than the full Q particle, but we are unable to explain why this would happen.
- 34 We attempted to investigate orderings using corpora (Mayer and Major 2023), but there were no tokens of stacked evidentials. This is likely due to low frequency usage of these constructions in general, but also the fact that the corpora are biased towards radio broadcasts and news as opposed to spoken Uyghur and narratives.

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