Negation in Mari/Udmurt verb clusters
An argument for postsyntactic Lowering[1]

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- ➤ In this talk, we contribute to the ongoing debate about the mechanisms underlying word formation by investigating the morphosyntactic behavior of negation in Mari and Udmurt verb clusters.
- ➤ Robust morphosyntactic and semantic evidence suggests that the negative auxiliary in these languages occupies a high position in the clause.
- ➤ On the surface, however, the negative Aux occurs in a low position, immediately preceding the dependent verb
- ➤ We argue that the mismatch is resolved by means of post-syntactic lowering of negation
  - ↳ Evidence for a post-syntactic lowering account comes from the constituency within the complex head as well as the optionality of clitic placement in the presence of negation
  - ↳ We show that alternative theories of word formation (such as syntactic head movement, base generation) fail to account for these patterns
- ➤ Further evidence for a post-syntactic treatment comes from *be*-support in Mari, which obtains if there is no verb for negation to lower onto.
- ➤ We provide evidence that Lowering is driven by a purely morphosyntactic requirement and not by a property of the VI.

1 Introduction: Negation in Udmurt and Mari

1.1 Negation

- ➤ Negation in Finno-Ugric languages is typically expressed by means of a negative auxiliary (see, e.g., Mitchell 2006; Miestamo et al. 2015); for Finnish, cf., e.g., Kaiser (2006: 329ff.):

(1) E-n minä viitsi riskeerata mitaään vielä.
NEG-1SG I.NOM feel.like.CN risk.INF anything.PART yet
'I don't feel like taking any risks yet.' *Finnish*

[1]We would like to thank Timofey Arkhangelskiy (University of Hamburg) for his help with the Udmurt Corpus and our native speaker consultants Elina Guseva (Mari State University) and Ekaterina Suncova, Yulia Speshilova, Anna Semenova and Evgenii Semenov. This research has been supported by the research project "Nominal Structures in Uralic Languages" (NKFI FK 125206) (Georgieva), the German Science Foundation (DFG) grant 2646/2-1 (Salzmann) and "Structure Removal in Syntax" (Weisser).

➤ Treating negation as an auxiliary in these languages has some immediate advantages:

- Negation is a syntactically independent element.
- Negation bears inflectional information like finite verbs, i.e., ϕ-features and (sometimes) tense or mood.
- Negation governs the form of the dependent verb, the so-called connegative stem (glossed as CN, often identical to the bare stem)

➤ Negation in Mari (see Alhoniemi 1993; Saarinen 2015) and Udmurt (see Winkler 2011; Edygarova 2015) also seems to fit this description.

- Negation bears tense and agreement morphology:

(2) a. puə̑-š-da
give-PST-2PL
'you gave'

b. ə̑-š-da pu
NEG-PST-2PL give.CN
'you did not give' *Mari*

- The negative verb is inflected for person in both languages; number is marked on the CN-form in Udmurt, but on the negation in Mari (cf. Edygarova 2015, Saarinen 2015):

(3) a. Dʲišetiś ȩ-z lʲiktʲ.
teacher NEG.PST-3 come.CN.SG
'The teacher didn't come.'

b. Dʲišetiś-jos ȩ-z lʲikte.
teacher-PL NEG.PST-3 come.CN.PL
'The teachers didn't come.' *Udmurt*

(4) a. Tunə̑ktə̑šo ə-š tol.
teacher NEG-PST come.CN
'The teacher didn't come.'

b. Tunə̑ktə̑šo-vlak ə-š-t tol.
teacher-PL NEG-PST-PL come.CN
'The teachers didn't come.' *Mari*

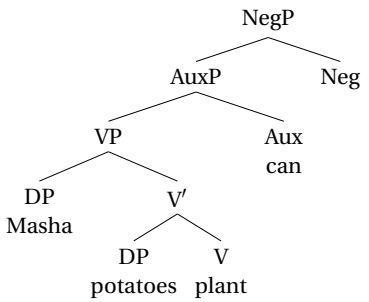
- Negation governs the form of the highest verb in the clause. In (5), Neg governs the CN-form on the auxiliary 'can', which itself governs a non-finite form on the lexical verb.

(5) Maša kartoška merttʲ-nʲ ug bʲigatʲ.
Masha potato.ACC plant-INF NEG.PRS.3 can.CN.SG
'Masha cannot plant potatoes.' *Udmurt*

- Morphological selection, cf. (6), suggests that NEG^0 is the highest verbal head in multi-verb constructions → the structure is as in (7):

(6) $V_{nonfinite}$ $CAN_{connegative}$ NEG

(7)



- This is supported by the semantics of NEG^0: it always scopes over verbs it governs, as in (8a); low scope of Neg is expressed with a negative converb (8b) (or a finite embedded clause)

(8) a. Maša-jen veraśkʲ-nʲ ȩ-z diśtʲ.
Masha-INS talk-INF NEG.PST-3 dare.CN.SG
'S/he didn't dare to talk to Masha.'
not 'S/he dared not to talk to Masha.'

b. Maša-jen veraśkʲ-tek kʲil'ʲ-nʲ diśt-i-z.
Masha-INS talk-NEG.CVB lie-INF dare-PST-3SG
'S/he dared not to talk to Masha.'

2 An atypical auxiliary

➤ The treatment of negation as an auxiliary is, however, insufficient: the postulated abstract syntactic structure is not matched by the surface properties of negation.

➤ Negation does not exhibit the same syntactic properties as other auxiliaries inasmuch as it (a) does not have the same flexibility with respect to the cluster ordering and (b) it requires linear adjacency with the main verb, and (c) forms a close unit with the connegative verb.

2.1 Verb cluster orders

➤ While Mari is a head-final/OV-language with objects typically preceding the verb, word order in Udmurt has become more flexible (cf. Asztalos 2018 and the references therein)

➤ Nonetheless, both languages show the same ordering possibilities in complex verb clusters.

2.1.1 Affirmative clusters

➤ Infinitive-selecting verbs embed each other and appear in a descending order: In (9), 'can' is the highest verb, which selects 'learn', which in turn selects 'prepare'. Abstractly, the order is thus [321].

(9) [...] perepeć, kömeć leśtị-nị dịšetskị-nị bịgat-o-zị. [321]
[...] perepech.ACC komech.ACC prepare-INF learn-INF can-FUT-3PL
'(They) can learn (how) to bake *perepech* and *komech*.'
Udmurt Corpus (IA Udmurtia, 2017.05.12)

➤ In addition, both Mari and Udmurt allow arguments and argument clauses to appear post-verbally, thus instantiating (partly) ascending orders:

(10) a. Mə̑j kušt-en kert-am. [21]
1SG dance-GER can-1SG
'I can dance.'
b. Mə̑j kert-am kušt-en. [12]
1SG can-1SG dance-GER
'I can dance.' *Mari*

(11) a. Ta peśanaj kịrdźa-nị bịgate [21]
this grandma sing-INF can.PRS.3SG
'This grandma can sing.'
b. Ta peśanaj bịgate kịrdźa-nị [12]
this grandma can.PRS.3SG sing-INF
'This grandma can sing.' *Udmurt*

↳ In this talk, we will focus mainly on the descending orders, but our results carry over to examples with ascending orders as well.

2.1.2 Negative Verb Clusters

➤ Verb clusters including negation show different ordering properties

➤ Given that we have morphological and semantic reasons to believe that the negative verb is the hierarchically highest verb, one expects it to occur cluster-finally in OV-languages

➤ Crucially, though, the negation can never be cluster-final:

↛ It precedes the lexical verb in 2-verb-clusters: [NEG-V]/12, as in (12a):

(12) a. Tud-ə̑m o-m už. [12]
3SG-ACC NEG-1SG see.CN
'I don't see her/him.'

b. *Tud-ə̑m už o-m. *[21]
3SG-ACC see.CN NEG-1SG
Mari

↛ And it always precedes the highest verb in 3+-verb clusters:

(13) a. Tud-ə̑m už-ə̑n o-m kert. [312]
3SG-ACC see-GER NEG-1SG can.CN
'I cannot see her/him.'

b. *Tud-ə̑m už-ə̑n kert o-m. *[321]
3SG-ACC see-GER can.CN NEG-1SG
Mari

(14) Mə̑j paša-m ə̑št-aš sör-en o-m kert. [4312]
1SG work-ACC do-INF promise-GER NEG-1SG can.CN
'I cannot promise to do the work.'
Mari

➤ Ascending orders are also possible in negated contexts, leading to a [123]-order:

(15) Tud-ə̑m o-m kert už-ə̑n. [123]
3SG-ACC NEG-1SG can.CN see-GER
'I cannot see her/him.'
Mari

2.2 Adjacency

2.2.1 Affirmative clusters

➤ Regular auxiliaries allow non-verbal material within the cluster:

(16) a. Mə̑j ə̑št-en **paša-m** kert-am.
1SG do-GER work-ACC can-1SG
'I can do the work.' [2-DP-1]

b. Mə̑j kert-am **paša-m** ə̑št-en.
1SG can-1SG work-ACC do-GER
'I can do the work.' [1-DP-2] *Mari*

2.2.2 Negated clusters

- Crucially, with negation, ther can be no non-verbal material between negation and the connegative verb: Negation *must* immediately precede the verb in the connegative form.

(17) *Mə̑j ə̑št-en o-m **paša-m** kert. *[1-DP-2]
1SG do-GER NEG-1SG work-ACC can.CN
'I cannot do the work.'
Mari

➤ In this respect, negation in Mari and Udmurt crucially differs from other Finno-Ugric languages like, e.g., Finnish, cf. Kaiser (2006: 329ff.)

(18) E-n minä viitsi riskeerata mitaään vielä. [1-DP-2]
NEG-1SG I.NOM feel.like.CN risk.INF anything.PART yet
'I don't feel like taking any risks yet.'
Finnish

2.3 A close unit

➤ The adjacency requirement above indicates that negation and connegative verb seem to form a close unit.

➤ This is supported by morphophonological diagnostics:

- Negation (unlike other auxiliaries) induces stress shift on the lexical verb: final syllable > first syllable in case of negation (cf. Edygarova 2015: 269)

(19) a. dǯšetsk-ˈo-z
study-FUT-3SG
's/he will study'

b. u-z ˈdǯšetskǯ
NEG.FUT-3 study.CN.SG
's/he will not study' *Udmurt*

- Further, negation triggers vowel reduction (and subsequent vowel harmony) of the copula in Mari:

(20) a. ul-am
be-1SG
'I am'

b. o-m-ə̑l
NEG-1-be
'I am not' *Mari*

➤ Another strong argument that negation and the highest verb form a close syntactic unit comes from particle verb constructions in Udmurt (cf. Winkler 2011):

↛ They derive from noun-incorporation and have a non-compositional meaning.

↛ The verb and the particle usually occur together and are also written as one word. Most of them receive only one word stress.

↛ Some particles can occur as independent words, cf. (21a), while others do not, cf. (21b):

(21) a. dur + baśt-
side take
'to defend so.' (lit. take so.'s side)

b. šum + pot-
? + seem, appear, go.out
'rejoice, be happy/glad'

↛ Crucially, however, they are separated by negation:[2]

(22) Ton ta ivor-lǯ šum e̯-d potǯ.
you this news-DAT ? NEG.PST-2 be.happy.CN.SG
'You were not happy about these news.'

↛ Auxiliaries like *bigat-* 'can', however, preferably occur outside the particle + verb complex.

[2]With both types of particle verbs, we actually find optionality as to whether the negation precedes or follows the particle. Thus, in addition to (22), some speakers of Udmurt also accept (and produce) (i):

(i) Ton e̯-d šum-potǯ.
you NEG.PST-2 ?-be.happy.CN.SG
'You were not happy.'

This suggests that particle and verb can optionally form a unit (via incorporation); as a consequence, negation adjoins to the entire complex head rather than just the verbal part.

Interim Summary:

➤ We have clear morphological and semantic evidence that the negation is the hierarchically highest element in the verb cluster:

- it bears inflectional information normally present on finite verbs: ϕ-features + tense
- It governs the form of the highest lexical verb via morphological selection.
- It obligatorily takes scope over the verb in the connegative form.

➤ Nonetheless, negation does not occur in the syntactically expected position: It always occurs immediately before the connegative verb.

➤ Furthermore, unlike other auxiliaries in Mari and Udmurt, negation forms a tight unit with the connegative verb:

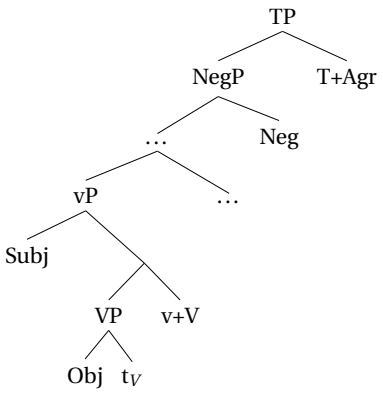
- Non-verbal material cannot be interleaved between Neg and the CN verb.
- Negation triggers morphophonological changes such as stress shift
- Negation even appears inside semantically opaque particle verbs.

3 A Lowering Account

3.1 The underlying syntactic structure

➤ The starting point of our discussion is the syntactic structure in (23), which is based on the observations made in Section 2:

(23)



➤ To account for the differences in ϕ-feature distribution (cf. the examples in (3) and (4)) we assume that T is the locus of all agreement features in Mari, while in Udmurt, T only hosts person features and v hosts number features.

➤ Negation is syntactically merged between v and T as we have seen that it takes scope above the highest verb and governs its morphological status.[3]

[3] Mitchell (2006) makes the same assumption solely based on the basis of morphological evidence.

➤ The position of T above Neg is supported by two observations:

- NPI subjects are possible:

(24) N'i-gö tə̑j-ə̑m ə̑-š už.
NEG-who 2SG-ACC NEG-PAST see.CN
'Nobody saw you.' *Mari*

- Further, we observe scope ambiguities with floating quantifiers (Edygarova 2015: 282) that indicate that the subject can but does not have to move above Neg .

(25) a. dʒ̹išetskiś-jos tros ẹ-z vue.
student-PL many NEG.PAST-3 arrive.CN.PL
'Not many students arrived.' ¬ ≻ many

b. tros-ez dʒ̹išetskiś-jos ẹ-z vue.
many-DET student-PL NEG.PAST-3 arrive.CN.PL
'Many students did not arrive.' many ≻ ¬
Udmurt

↳ These data follow nicely under the assumption that Neg is below T and movement of the subject to SpecTP is optional.

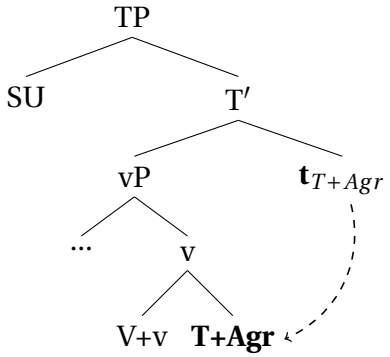
3.2 Lowering and linearization

Given the evidence we presented in Section 2, one question arises: How can we reconcile the high syntactic position of negation with its surface position?

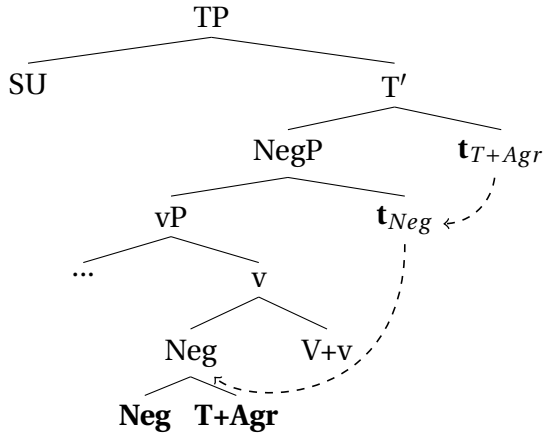
➤ We argue that this puzzle should be solved by means of postsyntactic lowering (à la Embick & Noyer 2001): Negation, as well as T, has a morphosyntactic requirement to occur in a local relation with v^0 (= within the same complex head) and both heads therefore lower in the postsyntax:

↳ Lowering applies successive-cyclically: First, T lowers to Neg and then the complex [Neg+T]-constituent lowers to v.

(26)



(27)



↳ Based on these derivations, the linearization algorithm for complex heads proceeds as follows:

(28) Linearization

a. Functional heads whose sister is lexical are ordered to the right (i.e., v follows V).
b. If both sisters are functional heads, the non-projecting head is linearized to the right. This leads to the suffixing default pattern in affirmative clusters.
c. The general linearization statement in [b] can be overridden by more specific statements. This is the case with negation: the negative auxiliary is linearized to the left of its sister, which results in the preverbal position of negation.

➤ The derivation in (27) accounts for the high scope of negation: Syntactically, it is merged in a high position. Its surface position is due to postsyntactic lowering, a process that (unlike syntactic head-movement) is not expected to feed semantic computation of scope.

➤ Furthermore, it accounts for the fact that the negative auxiliary behaves fundamentally differently from other types of embedding verbs in terms of:

i. Adjacency: Since postsyntactic lowering is an instance of adjunction, nothing can ever intervene between the negation and the connegative verb.
ii. Ordering: Lowering creates complex heads whose structure is unaffected by reordering operations applying to XPs. Thus, the fixed order of Neg and V is expected.

4 The Case of Optional Clitic Placement in Udmurt

4.1 Distribution of clitics

➤ Above, we said that nothing can occur in between the negation and the highest verb.

➤ However, there is one exception to this: Some adverbial clitics like *ńi* 'anymore, already' and *na* 'else, still' can be interleaved in the verb cluster, cf. Arkhangelskiy (2014)

➤ These clitics preferably occur after AUX in 2-verb clusters:[4]

(29) Ta pići pijaš lḭddź(iśk)ḭ-nḭ bḭgate=**ńi**.
this little boy read(INTR)-INF can.PRS.3SG=already
'This little boy can already read.' *Udmurt*

➤ In negated clusters, however, optionality arises. The clitics can either attach to the connegative verb or to negation.

(30) a. Ta peśanaj ug kḭrdźa=**ńi**.
this grandma NEG.PRS.3 sing.SG=anymore
b. Ta peśanaj ug=**ńi** kḭrdźa.
this grandma NEG.PRS.3=anymore sing.SG
'This grandma does not sing anymore.' *Udmurt*

(31) a. Ta peśanaj kḭrdźa-nḭ ug bḭgatḭ=**ńi**.
this grandma sing-INF NEG.PRS.3 can.SG=anymore
b. Ta peśanaj kḭrdźa-nḭ ug=**ńi** bḭgatḭ.
this grandma sing-INF NEG.PRS.3=anymore can.SG
'This grandma cannot sing anymore.' *Udmurt*

[4] Upon elicitation, some of our consultants also accept the V-cl-Aux order. We have to leave an investigation of why the judgments deviate from the corpus data discussed below for future research.

➤ These findings are supported by data from the Udmurt Corpus:[5]

- Affirmative clusters: cluster-final position of the clitic

(32) Placement of *ńi* and *na* in [V-Aux$_{can}$]-clusters:

	Hits
V-CAN-*ńi*	361
V-CAN-*na*	272
V-*ńi*-CAN	0
V-*na*-CAN	0

- Negative clusters: cluster-internal or cluster-final position of the clitic

(33) *ńi* and *na* in [Neg-V]-clusters:

	Hits
NEG-V-*ńi*	4552
NEG-V-*na*	2162
NEG-*ńi*-V	1353
NEG-*na*-V	615

(34) *ńi* and *na* in [V-Neg-Aux$_{can}$]-clusters:

	Hits
V-NEG-CAN-*ńi*	250
V-NEG-CAN-*na*	77
V-NEG-*ńi*-CAN	97
V-NEG-*na*-CAN	21
V-*ńi*-NEG-CAN	0
V-*na*-NEG-CAN	0

➤ The important observation is that the clitics can only occur before the highest verb in the context of negation.

➤ We argue that this follows nicely if we assume that the clitics can but do not have to be dragged along when negation undergoes lowering.

4.2 Deriving the clitic pattern

➤ The position of the clitics in the clausal spine:

↳ Given that they typically follow auxiliaries like *bigat-* 'can', we assume that the clitics are introduced above it.

↳ Given their aspectual nature, they are introduced below T.

↳ Following Löbner (1989), we assume that they are introduced above Neg:

- Adverbs with the meaning of 'already' and 'not anymore' are systematically related by internal negation. In Udmurt (as, e.g., in Hebrew) the relationship between the two meanings is morphologically transparent (unlike in English).
- While 'already' asserts that a proposition holds true at point *t* and presupposes that it was not true before *t*, 'not anymore' asserts that a proposition does not hold true at *t* and presupposes that it was true before *t*. Thus, in its negated use, the adverb takes scope over negation.

↳ We thus arrive at the following syntactic hierachy:

(35) [[[[[... V+v] Aux] Neg] Cl] T]

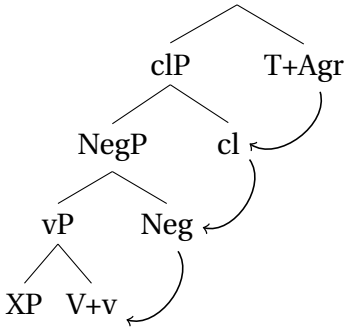
[5] The corpus, available at: http://udmurt.web-corpora.net, currently contains 9.5 million words. The searches were carried out in September 2018. In some, but not all cases, the results were manually disambiguated.

➤ We assume that the optionality of clitic placement results from the clitic's ambivalent phrase-structural status as to whether it projects its own phrase or not:

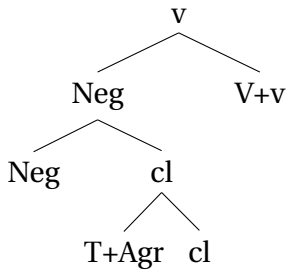
- If it projects, the clitic is dragged along by successive-cyclic lowering, which results in a cluster-internal position.
- If it does not project, the clitic is treated as an adjunct and is skipped by Lowering, which results in a cluster-final position (the clitic eventually leans onto adjacent verb)[6]

➤ In (36), we see the derivation for the former case: The clitic is dragged along and ends up in a cluster-internal position: (36a) illustrates the derivation, (36b) the resulting complex head and (36c) the final linear order.

(36) a.



b.



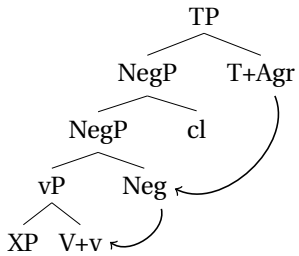
c. Neg-T+Agr-**cl**-V+v

↳ Negation is linearized to the left of its sister.

↳ As for the relative order of T and clitic, we assume that the VIs for *ńi* and *na* are specified to follow their sister (due to their enclitic nature).

➤ In (37), we see the derivation for the latter option: The clitic is skipped and ends up in a cluster-final position: (37a) illustrates the derivation, (37b) the resulting complex head and (37c) the final linear order.

(37) a.



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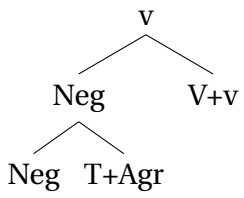


c. Neg-T+Agr-V+v-**cl**

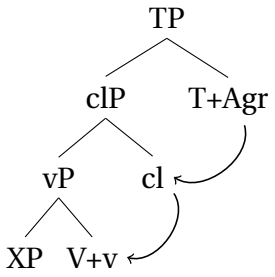
↳ The clitic is not part of the cluster but leans onto the verbal complex.

[6] Our implementation is close to the approach of Ceccheto & Donati (2010), who propose that lexical items always have, in principle, the capacity to provide the label. An obvious alternative to capture the ambiguity is to capitalize on the fact that, as heads adjoined to phrases, clitics are [+minimal, +maximal] in Bare Phrase Structure terms. Consequently, they can thus be the target of head-movement given their [+minimal] property, but they can also be skipped given their [+maximal] property.

➤ In affirmative orders with clitics we find no optionality. This is because both derivations converge on the same result:

- If the clitic picked is up:

(38) a.



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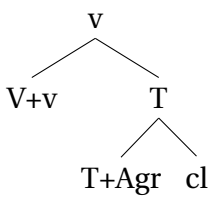
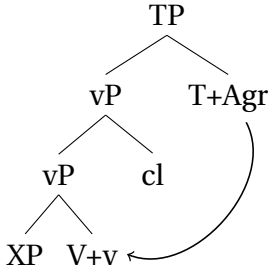


c. V+v-T+Agr-**cl**

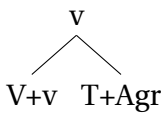
↳ The non-projecting T is linearized after v and the clitic follows its sister.

- If the clitic is skipped:

(39) a.



b.



c. V+v-T+Agr-**cl**

↳ The non-projecting T is linearized after v and the clitic leans onto the verb cluster.

5 Alternative approaches to complex head formation

5.1 Against a head-movement approach

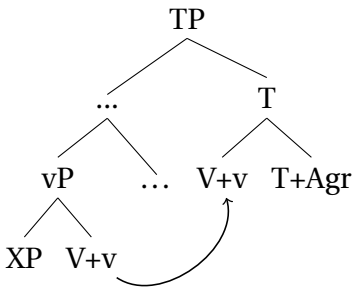
5.1.1 Classical head-movement

➤ We start out based on the following assumptions:

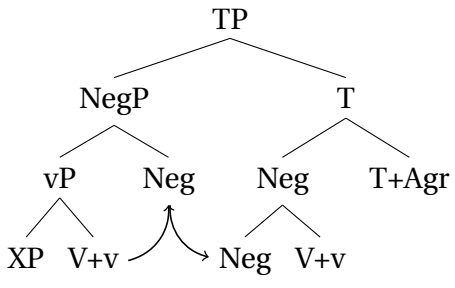
- The verb moves via v to T, picking up Neg if present, forming a complex head.
- The linearization algorithm is governed by similar constraints as proposed above.
- As above, clitics optionally project.

➤ In the affirmative cluster, we derive the correct result (40). But in the negative cluster (41), we obtain the wrong constituency:

(40)



(41)



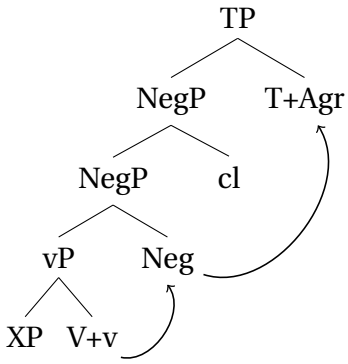
↳ Neg+V form a constituent to the exclusion of T.

↳ Thus, without additional assumptions, we would expect that T could not be affixed to Neg as it would arguably be linearized after V.

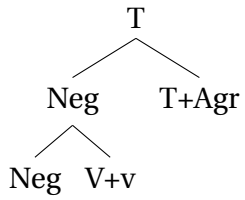
➤ As for the clitic orders, a standard head movement approach also predicts the wrong position of the clitic:

- If the clitic is skipped:

(42) a.



b.



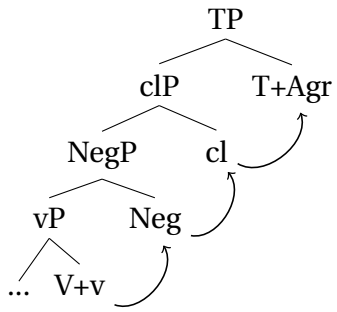
c. *XP-**cl** Neg-V+v-T+Agr

↳ If the clitic is skipped, we would expect it to occur before the cluster, either leaning onto a preverbal constituent or procliticizing to the verb cluster

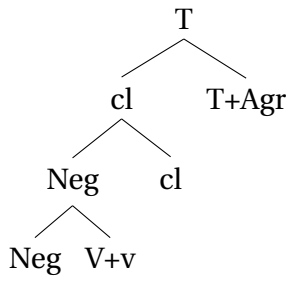
↳ Such patterns are unattested.

- If the clitic is dragged along:

(43) a.



b.



c. *Neg-V+v-**cl**-T+Agr

↳ Again, T is nowhere near its actual position of realization (i.e., on the negative auxiliary)

↳ The clitic intervenes between V and T, which is, again, not the correct constituency.

➤ Finally, a further problem for the head-movement account is that it must be stipulated that head-movement does not have any semantic effects in this case (cf. Lechner 2007, Roberts 2010)

↳ Otherwise, one cannot guarantee that negation always takes scope above the highest verb.

5.1.2 Recent alternatives to head-movement-based word formation

➤ Recently, a number of different approaches have been proposed sharing the basic idea that complex words can be spelled out in different positions of the clausal spine (Svenonius 2016, Arregi & Pietraszko 2019, Harizanov & Gribanova to appear):

↳ This allows the unification of raising and lowering: It is the same operation (syntactic = feature-sharing in Arregi & Pietraszko 2019, postsyntactic in Harizanov & Gribanova to appear)

➤ But these approaches encounter problems with the patterns at hand:

- It is unclear if the absence of semantic effects can be captured, at least in Arregi & Pietraszko (2019) (unproblematic for Harizanov & Gribanova to appear, where word formation is post-syntactic)
- They also make the wrong predictions w.r.t. constituency: complex heads are formed bottom-up (at least in Arregi & Pietraszko 2019, Harizanov & Gribanova to appear)
  - ↛ Arregi & Pietraszko (2019): The algorithm necessarily leads to mirror-principle compatible constituency as under traditional upward head-movement even if spelled out at the bottom of the Agree-chain.
  - ↛ This, again, predicts the wrong result for negated verb clusters:

    (44) $[_T\ [_{Neg}$ Neg+V]+T]
  - ↛ Harizanov & Gribanova (to appear): Individual heads are specified to undergo either raising or lowering, with the derivation proceeding bottom-up: Given a hierarchy A ≻ B ≻ C, Lowering of B to C must precede Lowering of A.
  - ↛ This also leads to the wrong result for negated verb clusters:

    (45) $[_V\ [_V$ Neg + V] T]

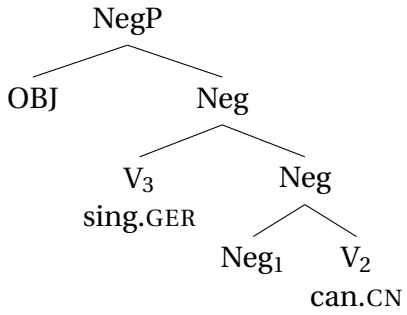
➤ What these approaches cannot model is successive-cyclic Lowering, as required by the constituency of complex heads containing negation.

5.2 Against a base-generation approach

➤ Another alternative would be a base-generation approach to complex verb clusters as in Bader & Schmid (2009), which rests on the following assumptions:

- Negation is directly generated in its surface position
- The whole cluster is base-generated as a complex head:

(46)



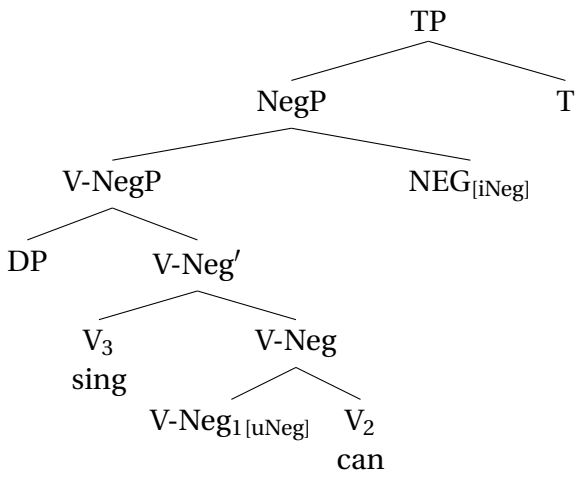
- Inflectional morphology targets the highest head of the verb cluster, i.e., Neg[7]
- Ordering properties are captured by means of selectional restrictions that are sensitive to directionality and complexity (X vs. XP):

  (47) Selectional restrictions in Udmurt/Mari verb clusters
  - a. Neg: → V
  - b. Aux/Mod: ← V(P)

[7] The ϕ-feature distribution in Udmurt remains a challenge.

- In order to capture the correct interpretation, an abstract negative head higher up in the structure could be postulated (cf., e.g., Penka 2007 on split scope readings)

(48)



➤ Apart from problems with the distribution of ϕ-features, which can be split up in Udmurt, the major problem of this account is that it offers no insights w.r.t. clitic placement:

↳ As there is no actual dislocation involved, it is unclear why negative clusters should be different from affirmative clusters.

↳ Base-generation accounts could be enhanced with a template-based account of morpheme orders (Crysmann & Bonami 2016). But such accounts are arbitrary and fail as clitics are normally not treated as affixes that are ordered by templates.

6 *Be*-support in Mari

➤ Additional evidence for a postsyntactic treatment of the cluster formation process comes from contexts without a suitable verbal host which the negation can lower onto.

↳ We observe the insertion of a dummy copula to fulfill the requirement of negation to appear in a local relation with the verb.

6.1 Contexts with *be*-support

6.1.1 Constituent negation

➤ In Mari, the same negation head used for sentential negation can also function as constituent negation (especially in contrastive pairs):

➤ In (49), there is PP-coordination with the first conjunct negated.

↳ Curiously, the negation is accompanied by a copula.

(49) Tə̑j šaχmat dene o-g-ə̑l, a šaške dene mod-ə̑ć́.
2SG chess with NEG-PRES.(3SG)-BE, but checkers with play-PAST.2SG
'You played not (with) chess but (with) checkers.' *Mari*

↳ Note that these are not VP-coordination structures with gapping of the lexical verb since negation does not agree with the subject.

↳ Further, this is no cleft structure as the 2SG subject precedes the conjunction and clefting out of a coordination is typically ungrammatical.

➤ The copula in these cases does not contribute any syntactic or semantic features.

↳ We argue that its presence is merely motivated by the morphosyntactic requirement of Neg to be in a local relationship with v.

↳ Cross-linguistic support for this view comes from other Uralic languages such as, e.g., Erzya: These languages use an invariant negative particle in contexts of constituent negation (Hamari & Aasmäe 2015: 313).

6.1.2 Negated infinitival/gerundial clauses

➤ Non-finite clauses can be negated by means of the negated copula:

(50) Tə̑j mə̑-lan-em vrač deke kaj-aš o-g-ə̑l, a paša-m ə̑št-aš
You me-DAT-1SG doctor to go-INF NEG-3SG-BE but work-ACC do-INF
šüdə̑-š-ə̑ć́.
order-PAST-2SG
'You ordered me not to go to the doctor but to do work.' *Mari*

↳ In (50), we see clearly that the copula does not contribute any syntactic or semantic features

↳ The lexical verb remains non-finite despite the presence of the finite copula

↳ The copula is invisible for morphological selection: The matrix verb *süd-* selects an infinitive, which is found on both verbs in the respective conjuncts *kaj-* ('go') and *ə̑št-* ('do').

↳ The copula would be expected to disrupt government if it were syntactically present:

(51) ... [[$_{\&P}$ [$_{Conj1}$ ... go NEG+COP] & [$_{Conj2}$ ... do]] ... order]
INF (go → order); INF (do → order)

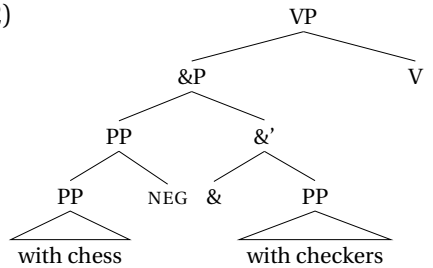
→ The copula is only present at PF to satisfy Neg's morphosyntactic requirement

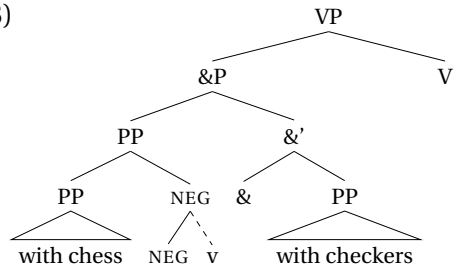
6.2 Mechanics of *be*-support

➤ In the cases of contrastive negation in constituent coordination, negation is adjoined to the PP of the first conjunct:

↳ Lowering does not help satisfy Neg's morphosyntactic requirement

↳ A dummy verb is inserted to repair the structure (cf. Choi & Harley in press on node sprouting):

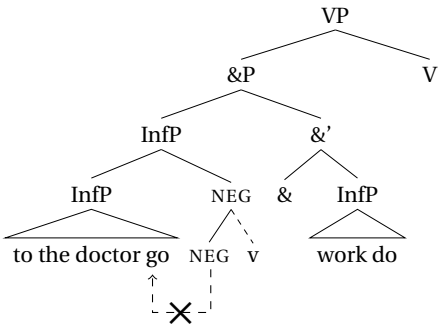
(52)


(53)


- ➤ The copula is, by assumption, the radically underspecified exponent that is inserted in complete absence of syntactic or semantic features.
- ➤ In a similar fashion, the third singular inflection is merely a default value that is inserted at PF as well.

➤ In the case of the negated infinitives and gerunds, we assume that negation is treated as adjoined (i.e. it does not project a NegP). Thus Lowering is blocked for structural reasons (because negation is an adjunct).

(54)



↳ Evidence for the assumption that negation of an infinitive has a different status than a finite clause negation comes from the fact that it does not license NPIs such as *nigö* ('anyone'):

(55) a. Tə̑j mə̑-lan-em *ńigö-lan /iktaž-lan ojl-aš o-g-ə̑l, a
You me-DAT anyone-DAT someone-DAT speak-INF NEG-PRES-BE but
mutdə̑mo lij-aš šüde-šə̑-ć́
silent stay-INF order-PAST-2SG
'You ordered me to not speak to anyone but to remain silent.'

➤ Even if the negation is an adjunct, is it still subject to the requirement to appear in a local relation with a verb. The insertion of a dummy copula is a morphological repair operation to save the derivation from crashing.

6.3 Arguments for a post-syntactic treatment

We contend that the pattern of *be*-support in Mari also provides evidence for a postsyntactic treatment of the cluster forming operation.

➤ The copula provides no semantic or syntactic features:

- ↳ The copula does not affect the category of the conjunct. The negated PP still remains a PP despite the presence of a copula.
- ↳ Even more strikingly, the copula (despite it clearly being verbal) is invisible for status government/morphological selection (cf. (51)).

➤ All of this follows if the copula is only present at PF

➤ Under a syntactic head-movement approach, the satisfaction of the head movement trigger on Neg would arguably have to take place in syntax.

- ↳ But then one might expect the copula to interfere with status government: the copula would be introduced before the matrix verb

7 Cliticization as a morphosyntactic operation

➤ In the preceding sections, we argued at length that negation lowers onto the lexical verb in the postsyntax.

➤ The question is what triggers this operation.

➤ A seemingly intuitive solution would state that lowering is driven by the phonological properties of the negation.

- ↛ Maybe the exponent of negation is somehow deficient and requires a phonological/prosodic host.
- ↛ Then, we could also assume that the pro-clitic nature of negation is simply a matter of its phonological properties.

! But: Under the standard assumption that Vocabulary Insertion takes place at linearization (and thus after Lowering, cf. Embick & Noyer 2001), triggering Lowering by the clitichood is architecturally impossible: information about the VI is not yet available.

↛ Do we encounter a look-ahead problem, i.e., a syntactic operation triggered by morphological/phonological properties?

(56) Proposal:
   a. Lowering: driven by a *morphosyntactic* requirement (cf. Embick & Noyer 2001 on Lowering in English)
   b. Linearization: A general property of Neg-heads

7.1 The lowering requirement is a property of Neg-heads, not VIs

➤ It can be shown quite straightforwardly that the requirement to appear in a local relation with v is a requirement of the syntactic head and not of the exponent (i.e., the Vocabulary Item):

- First, we can observe that in Mari, for example, negation has four different allomorphs, all of which show the exact same behavior with respect to lowering and linearization.
- Most strikingly, lowering and procliticization also takes place with a zero allomorph which appears in the first singular preterite in Mari.

(57) a. ∅-š-əm puro
NEG-PST-1SG enter.CN
'I did not enter.'

b. ə-š-na puro
NEG-PST-1PL enter.CN
'We didn't enter.'

➤ This shows that lowering and linearization cannot plausibly be due to the phonological requirements of the exponent. They must be due to the morphosyntactic features of the head.

7.2 Interaction with ellipsis

➤ Further evidence that lowering is due to a morphosyntactic requirement comes from its interaction with ellipsis:

↳ Lowering is not bled by ellipsis!

➤ In Udmurt, negation is used without connegative verb in contrastive coordination (cf. Edygarova 2015: 285)

(58) Lim̨i Tęd'i̯-jez mon ug **~~kin̨dźa~~**, ton kin̨dźal-o-d.
white snow-ACC 1SG NEG.FUT.1 sing 2SG sing-FUT-2SG
'It is not me but you who will sing (the song) *White Snow*.' *Udmurt*

- In both Udmurt an Mari: Negative Aux can be used in answers to polar questions (cf. Edygarova 2015: 280, Saarinen 2015: 344f.)

(59) Tače tol-at mo? – O-g-əm **~~tol~~**.
today come-2SG Q NEG-PRS-1SG come
'Will you come today? – No.' *Mari*

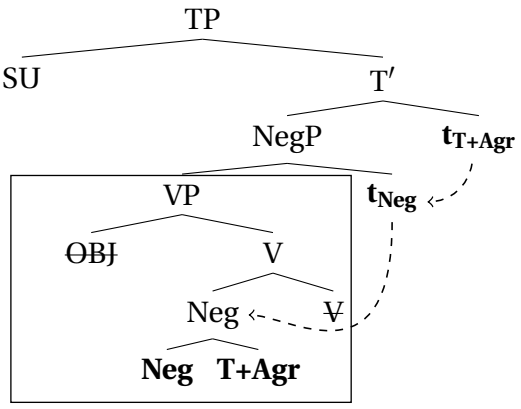
(60) Lim̨i Tęd'i̯-jez kin̨dźal-o-d=a? – Ug **~~kin̨dźa Lim̨i Tęd'i̯-jez~~**.
white snow-ACC sing-FUT-2SG=Q NEG.FUT.1 sing white snow
'Will you sing (the song) *White Snow*? – No.' *Udmurt*

➤ We argue that this follows from our proposal assuming that ellipsis is an instruction for non-pronunciation, i.e., that Vocabulary Insertion does not take place (cf. Aelbrecht 2010):

➤ Thus, the syntactic structure is present when Lowering occurs

➤ In order to ensure that Neg survives ellipsis, one has to assume that terminals are marked for non-pronunciation before Lowering

(61)



➤ Lowering takes place because Neg must be in a local relationship with V, not because it needs a host (in other words, lowering is not teleological).

↳ The fact that VP-internal terminals have already been marked for non-pronounciation does not interfere with lowering (pace Saab & Lipták 2016, Murphy 2018).

↳ Again we see that lowering does not apply because of a phonological/prosodic requirement but because of a morphosyntactic one.

➤ Why is there no *be*-support in Mari fragment answers?

↳ *be*-support only applies if Lowering is blocked, i.e., if no suitable verb is available in the structure; recall constituent negation in (52).

8 Conclusion

➤ The semantic and morphosyntactic properties of negation in Mari and Udmurt suggest that it occupies a high position in the clausal spine. On the surface, however, it seems to occupy a low position.

➤ We argue that this apparent paradox can and should be resolved by means of postsyntactic lowering: Negation is merged (and semantically computed) high in the structure, but postsyntactically, it lowers onto the highest verb.

↳ The strongest arguments for this claim came from the internal constituency of the negation-verb complex as well as the optionality of adverbial clitic placement in the context of negation.

➤ We show that these properties cannot be modelled in alternative approaches based on various implementations of head movement or base-generation.

➤ We provide further evidence for the postsyntactic nature of the cluster formation process by investigating the interaction of lowering with several other postsyntactic processes such as *be*-support in Mari, allomorphy and ellipsis.

↳ Crucially, lowering is triggered by a (morpho)syntactic requirement of the negation head, not by phonological or prosodic properties of the respective exponents.

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