Ellipsis does not bleed Lowering: Evidence from *do*-support and fragment answers in Finno-Ugric*

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1. Introduction

The interaction of postsyntactic morphological processes is still a relatively new field of research where generalizations only begin to emerge. This is undoubtedly due to the fact that both the overall inventory of processes as well as their formal properties have been a matter of debate for quite some time. In this paper, we contribute to this discussion by focusing on the interaction of three postsyntactic processes including Lowering, ellipsis and insertion of semantically vacuous dummy elements (a.k.a node sprouting). We will provide evidence that hierarchy-based operations like Lowering must crucially precede operations that are related to phonological (non-)realization, including repairs like *do*-support and ellipsis. This will contribute to our understanding of the architecture of the post-syntactic component and the nature of Lowering.

In previous work (Georgieva et al. 2019, to appear), we studied the verbal complex of the two Finno-Ugric languages Meadow Mari (henceforth, Mari) and Udmurt and argued in detail that it is derived by means of postsyntactic Lowering. Higher verbal heads including Neg and T lower down to *v* in order to create one complex verbal head. Based on this study, we now investigate instances of this Lowering operation in contexts where, at least on the surface, there is no overt host: (i) Constituent negation in Mari: there is no *v* in the structure for Neg to lower onto, (ii) VP-ellipsis: The target for Lowering is elided. We observe that the former context triggers a repair operation (namely, *be*-support, i.e., the insertion of a semantically vacuous dummy copula), whereas the latter does not. We conclude from these

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facts that ellipsis does not bleed Lowering. Rather, Lowering can apply and target a constituent which is syntactically marked for deletion. This interaction shows that Lowering is not driven by morphophonological properties but by purely morphosyntactic requirements. It is thus non-teleological (Embick 2010).

Our findings are in conflict with claims made in Saab and Lipták 2016 and Murphy 2018, who argue that Lowering is bled by ellipsis. We discuss data from these authors and show that their conclusions are not forced as the data can be reanalyzed within our system.

This paper is organized as follows: in Section 2, we present an overview of the basic properties of negation in the two languages and propose an account in terms of postsyntactic Lowering. In Section 3, we study Lowering in two configurations where there is no verb to lower onto on the surface. We explore the consequences for the interaction of postsyntactic processes and show that ellipsis does not bleed Lowering. Section 4 embeds these results into a larger context and shows that phenomena that have been used to argue for the reverse ordering between Lowering and ellipsis can be straightforwardly reanalyzed given our assumptions. Section 5 concludes.

2. Background

Negation in Mari and Udmurt is expressed by a negative auxiliary (bearing tense and agreement) that obligatorily takes scope above all dependent verbs and governs a special form of dependent auxiliaries or verbs (so-called 'connegative stem', CN), see (1) (Edygarova 2015; Saarinen 2015).

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

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

In Georgieva et al. 2019, to appear we have shown that negation crucially differs from other auxiliaries in the languages and negation in other Finno-Ugric languages. Firstly, it must precede the hierarchically highest verb (other auxiliaries can follow the verb).

(2) Ta peśanaj kartoška ug merttį / *merttį ug.
this grandma potato.ACC NEG.PRS.3 plant.CN.SG plant.CN.SG NEG.PRS.3
'This grandma doesn't plant potatoes.' *Udmurt*

Secondly, it must obligatorily be adjacent to the highest verb (other auxiliaries need not).

(3) *Ta peśanaj ug kartoška merttį. *[Neg-DP-V]
this grandma NEG.PRS.3 potato.ACC plant.CN.SG
'This grandma doesn't plant potatoes.' *Udmurt*

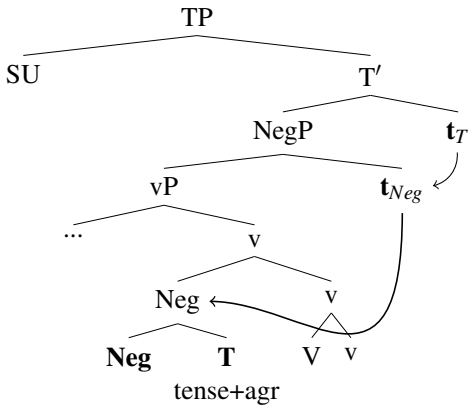
Thirdly, negation interacts morphophonologically with the highest verb as it induces stress shift on the main verb in Udmurt and, in some cases, vowel reduction in Mari. For all of

these reasons, we conclude that unlike with regular auxiliaries, negation and the highest verb of the clause form one complex head.

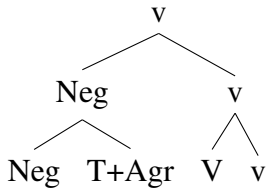
We provided various kinds of evidence that this complex head is created by means of postsyntactic Lowering (see Embick and Noyer 2001) rather than syntactic head-movement or base-generation. One of the main arguments for the Lowering derivation came from the internal constituency of the complex head. The systematic morpheme order alternation between the affirmative and the negative verb forms illustrated in (1) (V-Tense-ϕ vs. Neg-Tense-ϕ-V) can be derived straightforwardly if we assume that, in the affirmative forms, tense and ϕ-features lower down to *v*, thereby suffixing to the verb. In cases of negation however, tense and ϕ-features lower onto the negation, thereby suffixing to the negation, which then in turn lowers further down to *v*.

The formal derivation of negative verb clusters in Mari and Udmurt is illustrated in (4). Negation starts out high (where it takes scope) right below T, which bears ϕ-agreement. Both T and Neg bear a morphosyntactic requirement to be in a local relation with *v*, that is to say, within the same complex head (see Embick and Noyer 2001 on Lowering of T in English). Therefore, they lower down to *v* successive-cyclically. First T lowers onto Neg and then Neg+T lowers down to *v*. This results in the complex head in (5), which in turn leads to the linear string in (6). Note that we assume that Neg^0 has a requirement to be linearized to the left of its sister, which overrides the default suffixing pattern; as a side-effect, tense and agreement morphology, which is attached to Neg, also precedes the verb.

(4)



(5)



(6) Neg-T+Agr-V-v

As we have shown in previous work (Georgieva et al. 2019, to appear), Lowering accounts for many of the crucial properties of the construction: First, given that a complex head is formed, the adjacency requirement observed above and the morphophonological interactions follow automatically. Second, since it takes place postsyntactically, the absence of semantic effects, namely, the fact that negation still takes high scope, is derived as well. Third, the Lowering approach predicts the correct morpheme order since T and Neg form a unit to the exclusion of V. Under competing approaches to complex head formation such as head-movement or base-generation, the semantic vacuousness is a priori unexpected and both types of approaches fail to account for the constituency of the complex head. Further

arguments for the Lowering approach come from the possibility to interleave adverbial clitics inside the verbal complex *only* in the presence of negation (see Georgieva et al. 2019, to appear) and the interaction of complex head-formation processes with other postsyntactic processes (see below and Georgieva et al. to appear).

Against the background of this derivation, in the next section, we will consider two contexts, where, at least on the surface, no host for Lowering is visible. This will allow us to investigate the interaction of post-syntactic processes and thereby gain new insights into the nature of the Lowering operation.

3. Lowering in contexts without a host

In this section we investigate the interaction of Lowering with other post-syntactic processes. We do so by studying Lowering in two contexts where there is, at least on the surface, no verb to lower onto. The first case involves constituent negation in Mari (Section 3.1), the second is ellipsis (Section 3.2). We will show that the two contexts have different consequences for Lowering: In the first, a dummy copula is inserted and attaches to Neg, while in the second context, negation survives on its own without a host. We interpret this as showing that Lowering precedes ellipsis and thus takes place whenever it can, irrespective of the eventual morphophonological properties of its host. Only in the absence of a structural host does a repair operation come to the rescue.

3.1 When there is no host for Lowering: *Be*-support in Mari

Mari employs the same negative head that is used for sentential negation for constituent negation such as (7). This construction is often, but not exclusively used in contrastive coordination. We can see that this is in fact the same element as with sentential negation because (i) both sentential and constituent negation bear tense/agreement morphology, compare with the third person present tense morpheme /-g-/ in (7–9) and (ii) both sentential and constituent negation require a verbal element to its right. In the case of sentential negation, this is the main verb of the clause, whereas in cases of constituent negation, Neg is accompanied by a semantically vacuous dummy copula /-ə̑l-/. In (7), we see a coordination of PPs, the first of which is negated. In (8), we see constituent negation of a direct object, and in (9), we see a subject associated with constituent negation.

(7) Tə̑j šaχmat dene o-g-ə̑l, a šaške dene mod-ə̑ć.
2SG chess with NEG-PRS.3SG-be but checkers with play-PST.2SG
'You played not (with) chess but (with) checkers.' *Mari*

(8) Tə̑j olma-m o-g-ə̑l koć́k-ə̑ć.
2SG apple-ACC NEG-PRS.3SG-be eat-PST.2SG
'You ate not an apple.' *Mari*

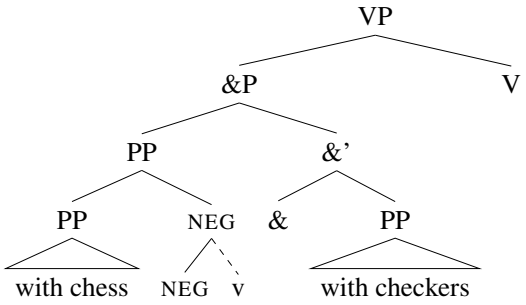
(9) Olma-m tə̑j o-g-ə̑l, a Petr koć́k-o.
apple-ACC 2SG NEG-PRS.3SG-be but Peter eat-PST.3SG

'Not you but Peter ate the apple.' *Mari*

Note that there is no evidence that these examples involve clefts (à la, e.g., *It was not an apple that you ate)*: First, the allegedly clefted constituent is still preceded by the subject *tə̂j* 'you (sg)' in (7) and (8) or the object in 9. This shows that the negated constituents are not clause-external (in a cleft construction, one would expect the clefted constituent to be at the edge of the entire construction). Second, we observe that the copula neither shows tense nor subject agreement features but appears with default PRS.3SG values. Even in the case where the constituent negation is adjoined to the subject as in (9), it does not show person agreement. If these were clefts, we would at least expect past tense marking on the copula to be possible. Third, there are no signs of relativization in any of these examples. Given that the copula does not agree with the subject, these examples also cannot involve ellipsis (i.e., backward gapping) of a verb (e.g., 'play').

The copula that is attached to the constituent negation does not contribute anything semantically nor does it show any signs of syntactic activity as it always bears default agreement and tense and does not affect the category of the conjunct it is a part of. We therefore analyze it as a semantically empty dummy copula which is inserted post-syntactically as a repair operation to satisfy Neg's requirement to appear in a local relation with *v*. Neg is adjoined to the constituent to be negated. It cannot lower as there is no verb to satisfy its requirement. As a repair, a morphologically default and semantically vacuous element is inserted at PF. This means that the copula is syntactically invisible, that is, it does not affect the syntactic category of the conjunct and does not agree with the subject. The copula insertion is indicated by the dashed line in (10).

(10)



This operation can be viewed as an instance of node sprouting, a process also known as insertion of dissociated morphemes (see Halle and Marantz 1993; Embick 2000; Choi and Harley 2019). Node sprouting or insertion of a dissociated morpheme is typically used to provide a terminal node for a morphosyntactic feature which cannot remain unrealized and is expressed by a separate morpheme. This usually involves agreement or honorification features, as in, for example, Choi and Harley 2019. But it strikes us as plausible that the availability of node sprouting as an operation can, in principle, repair other kinds of morphological deficiencies.

Since the copula is semantically the most underspecified verb available, it is eventually chosen as the correct exponent of the *v* head in (10) in accordance with the standard rules

of Vocabulary Insertion. That the specification for 3rd person singular can can function as a default is well-estabslished. We will assume that the same holds for the present tense specification. Thus, these default features and their corresponding forms must consequently be supplied at PF as well (given that there is no local T-head that could lower onto the inserted *v*). In analogy to English *do*-support, we refer to this repair operation as *be*-support.[1]

3.2 When the host has been elided: No *be*-Support

What we can take from the discussion above is that (at least) Mari has a repair operation at its disposal for cases where there is no suitable host for Lowering. Against this background, consider the following examples involving coordination ellipsis in Udmurt and fragment answers in both languages:

(11) Lɨmɨ Tɐd'ɨ-jez mi u-m **~~kɨrdźale~~**, ti kɨrdźal-o-dɨ.
snow white-ACC 1PL NEG.FUT-1 sing.CN.PL 2PL sing-FUT-2PL
'Not we but you will sing (the song) *Snow is white*.' *Udmurt*

(12) Pij kudal-eš mo? – O-g-eš.
dog run-PRS.3SG Q NEG-PRS-3SG
'Is the dog running?' – No.' *Mari* (Saarinen 2015:345)

(13) Lɨmɨ Tɐd'ɨ-jez kɨrdźal-o-dɨ=a? – U-m **~~kɨrdźale~~** **~~Lɨmɨ Tɐd'ɨ-jez~~**.
snow white-ACC sing-FUT-2PL=Q NEG.FUT-1 sing.CN.PL snow white-ACC
'Will you sing (the song) *Snow is white*? – No.' *Udmurt*

Under the assumption that such examples involve ellipsis of the lexical verb or potentially some larger constituent that includes it, the grammaticality of these examples is unexpected since negation ends up without a host. Given the discussion of the previous section, one would have expected the insertion of the dummy copula in Mari in (12). But surprisingly, negation can survive on its own. This raises the question, of course, what is different in the examples at hand, compared to those in the previous section. The difference, we would like to submit, lies in the fact that in cases of constituent negation, there never was a verb to lower onto to begin with. This made the insertion of a dummy copula necessary. We

[1]Note that the very same copula is used in copular clauses as the negative counterpart of the dropped 3SG copula (ia,b) (cf. with the copular clauses with a 2SG subject in which the copula *ul-* is present in affirmative contexts).

(i) a. Tudo joć̓a.
3SG child
'S/he is a child.'

b. Tudo joć̓a o-g-ə̂l.
3SG child NEG-PRS.3SG-be
'S/he is not a child.'

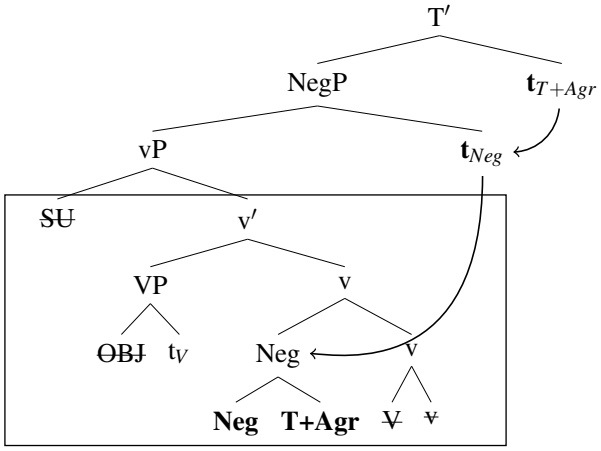
(ii) a. Tə̂j tunə̂ktə̂šo ul-at.
2SG teacher be-PRS.2SG
'Your are a teacher.'

b. Tə̂j tunə̂ktə̂šo o-t-ə̂l.
2SG teacher NEG-2SG-be
'Your are not a teacher.' (Riese et al. 2017:110)

will now argue that in the examples in this section, there is reason to believe that a verb is structurally present in the structure that Neg can lower onto. Given appropriate assumptions about the nature of ellipsis and its timing, this will explain why the subsequent ellipsis of the verb does not affect Lowering of negation.

To be concrete, we assume that under ellipsis, the syntactic structure is still fully present; ellipsis is just an instruction for non-pronunciation, in other words, an instruction that blocks Vocabulary Insertion (see Aelbrecht 2010). We assume that the terminals in the *v*P complement of Neg are marked for deletion in syntax already. Furthermore, we assume that the ellipsis diacritic trickles down from the maximal projection to the terminals and does not remain on *v*P. Since the syntactic structure is still present at the point of the PF-derivation when Lowering takes place, its structural description is met, and, consequently, Neg and T lower down to *v*. Negation is the only element inside the *v*P that survives deletion because it is not marked for non-pronunciation. Crucially, since Neg is in a local relationship with *v*, *be*-support is blocked. The PF-derivation for (13) is illustrated in the tree in (14). [2]

(14)



In other words, Lowering proceeds regardless of the fact that the verb it lowers onto has been marked for non-pronounciation. This shows (a) that Lowering is unaffected by ellipsis and (b) that Lowering applies due to a morphosyntactic requirement of Neg, and not due to the need to have a phonological host, in which case one would have expected *be*-support in Mari. Lowering simply takes place when its structural description is met; it is non-teleological. This is an important result because in all the cases we are aware of that Lowering has been applied to in the literature, it invariably leads to affixation; but given the morphosyntactic conception of Lowering in Embick and Noyer 2001, the case we are describing here is in fact expected and thus fills a gap in the typology of Lowering.[3]

[2] An alternative analysis of the ellipsis facts based on Neg-to-C movement and TP-deletion as proposed in Holmberg 2015 for Finnish strikes us as unattractive for Mari/Udmurt since—unlike in Finnish—there is no independent evidence for upward movement of Neg.

[3] In Georgieva et al. to appear, we provide two further arguments that the trigger for Lowering is morphosyntactic rather than phonological/prosodic. Both show that the requirement to occur in a local relation-

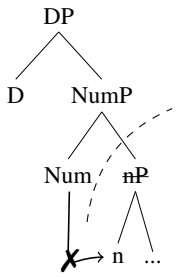
4. Discussion

The (non-)application of the repair operation *be*-support gives us a straightforward diagnostic to determine whether Lowering has applied or not. We have shown that copula insertion takes place in constituent negation in Mari but not in fragment answers. This diagnostic suggests that (at least) in Mari and Udmurt verb clusters, Lowering is *not* bled by ellipsis. This conclusion is in contrast to the claims in Saab and Lipták 2016 and Murphy 2018, who discuss the interaction of Lowering and NP-ellipsis in Hungarian and German. Saab and Lipták 2016 argue for Hungarian that inflectional features in the noun phrase are located on a functional head Num above *n*P. Normally, this head lowers onto *n* and is realized on the noun as in (15a). Under *n*P-ellipsis, as in (16), they argue, Lowering is blocked. The exponent that normally occurs on *n* is instead attached to the preceding adjective by Local Dislocation, see (15b) (similar data are found in Udmurt/Mari).[4]

(15) a. a régi kis ház-ak-at
the old small house-PL-ACC
'the old small houses (ACC)'

b. az új nagy-ok-at
the new big-PL-ACC
'the new big ones (ACC)'
Hungarian (Saab and Lipták 2016:84, 87)

(16)



This derivation is incompatible with our assumptions as well as our understanding of the postsyntactic architecture where hierarchy-based processes *always* precede those which are sensitive to phonological (non-)realization. However, the data can be reanalyzed under our

ship with *v* is a requirement of the syntactic head and not of the exponent (i.e., the Vocabulary Item). First, in Mari, negation has four different allomorphs, all of which show the exact same behavior with respect Lowering and linearization. Second, Lowering and linearization of the inflectional features to the left of the main verb also takes place with the zero allomorph. Consider the following minimal pair:

(i) a. ∅-š-əm puro
NEG-PST-1SG enter.CN
'I didn't enter.'

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

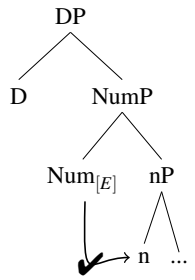
A zero allomorph for negation seems somewhat counterintuitive, but it is well-motivated since the verb in (ia) appears in the connegative form and it is preceded by the inflectional suffixes, just as in negative contexts with overtly exponed negation (ib). At any rate, this fact shows very clearly that Lowering and linearization cannot plausibly be due to the phonological requirements of the exponent. Rather, the special properties of negation must be due to the morphosyntactic features of the head.

[4]The authors are not explicit about the placement of case. Since determiners do not bear case, case morphemes are arguably inserted into a separate right-headed KP-layer above DP and then attached to the element on the left at PF by Local Dislocation, be it the noun or, under ellipsis, a preceding adjective.

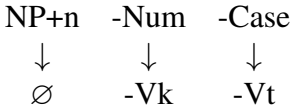
The analysis in Murphy 2018 is essentially the same. The relevant head is a phi-head above *n*P, which attaches to the determiner under *n*P-ellipsis and leads to strong/pronominal inflection on D. The major difference is that when the phi-head lowers onto the noun in case there is no ellipsis, it is realized as zero.

assumptions (focusing on Hungarian for now): *n*P and its subconstituents are marked for non-pronunciation in the syntax. Then, Num lowers onto *n*. Due to the phonological deficiency of the VIs inserted into Num (they are affixes), they cannot be pronounced without a host. Thus, as a last-resort repair operation, they cliticize to the preceding element (the adjective in 15b). We view this process as an instance of Local Dislocation:

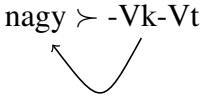
(17) a. Lowering:



b. Ellipsis:



c. Local Dislocation:



The only difference between the cases in (15b) and negation in (11–13) is whether the lowered element itself is phonologically deficient, as is the case with number morphology in Hungarian, or not, like negation in Mari/Udmurt. Only in the former will there be an additional repair operation.[5]

5. Conclusion

We investigated the interaction of post-syntactic operations by studying negated verb clusters in Mari/Udmurt. We first showed that negation in Mari/Udmurt forms a complex head with the hierarchically highest verb by means of postsyntactic Lowering. We then considered contexts where, on the surface, there was no verb to lower onto, namely, constituent negation and V(P)-ellipsis. We observed that in the former, a dummy copula was inserted as a repair, while in the latter, the negation survived on its own. We interpret this pattern to show that Lowering is driven by a morphosyntactic requirement of Neg: (i) Lowering of Neg is not bled by ellipsis, and there is no *be*-support, (ii) given that there is an independent repair operation available (*be*-support), the facts indicate that negation is not phonologically deficient, in other words, it does not need a host. The absence of a bleeding effect follows under the architecturally straightforward assumption that hierarchy-based operations precede those that affect the phonological properties of terminals, including ellipsis. Our case study thus fills an important gap in documenting the first instance of Lowering (to our knowledge) that does not lead to affixation and thus reveals its non-teleological nature.

[5]In English inflection, VP-ellipsis actually blocks Lowering of T and leads to *do*-support. This is in line with the assumptions in Saab and Lipták 2016 but unexpected both under our assumptions and those in Embick and Noyer 2001, where Lowering is also driven by a morphosyntactic requirement; Lowering should actually block *do*-support, given the logic of their approach. What seems to be happening is that the Lowering derivation crashes because the exponents inserted into T fail to find a host, in other words, the structure is ruled out by some version of the stray affix filter (all constituents within vP except T are marked for non-pronunciation). In this situation, *do*-support emerges as the only possibility. Note that this reasoning implies transderivational economy.

It does not apply in order to satisfy morphophonological requirements of Vocabulary Items. Lowering solely applies because of morphosyntactic triggers, which in the case at hand is a requirement to be in a local relationship with *v*. Thus, no look-ahead is required.

References

Aelbrecht, Lobke. 2010. *The Syntactic Licensing of Ellipsis*. Amsterdam: John Benjamins.

Choi, Jae-Hoon, and Heidi Harley. 2019. Locality domains and morphological rules: Phases, heads, node-sprouting and suppletion in Korean honorification. *Natural Language & Linguistic Theory* 37:1319–1365.

Edygarova, Svetlana. 2015. Negation in Udmurt. In *Negation in Uralic languages*, ed. Matti Miestamo, Anne Tamm, and Beáta Wagner-Nagy, 265–291. Amsterdam: John Benjamins.

Embick, David. 2000. Features, syntax, and categories in the Latin perfect. *Linguistic Inquiry* 31:185–231.

Embick, David. 2010. *Localism versus globalism in morphology and phonology*. Cambridge, MA: MIT Press.

Embick, David, and Rolf Noyer. 2001. Movement operations after syntax. *Linguistic Inquiry* 32:555–595.

Georgieva, Ekaterina, Martin Salzmann, and Philipp Weisser. 2019. An argument for post-syntactic lowering of negation in Udmurt and Mari. In *NELS 49: Proceedings of the Forty-Ninth Annual Meeting of the North East Linguistic Society, Volume 2*, ed. Maggie Baird and Jonathan Pesetsky, 11–20. Amherst, MA: GLSA.

Georgieva, Ekaterina, Martin Salzmann, and Philipp Weisser. to appear. Negative verb clusters in Mari and Udmurt and why they require postsyntactic top-down word formation. To appear in Natural Language & Linguistic Theory.

Halle, Morris, and Alec Marantz. 1993. Distributed morphology and the pieces of inflection. In *The view from building 20. Essays in linguistics in honour of Sylvain Bromberger*, ed. Ken Hale and Samuel Jay Keyser, 111–176. Cambridge, MA: MIT Press.

Holmberg, Anders. 2015. *The Syntax of Yes and No*. Oxford: Oxford University Press.

Murphy, Andrew. 2018. Pronominal inflection and NP ellipsis in German. *The Journal of Comparative Germanic Linguistics* 21:327–379.

Riese, Timothy, Jeremy Bradley, Emma Yakimova, and Galina Krylova. 2017. *A Comprehensive Introduction to the Mari Language*. University of Vienna. [Release 3.2].

Saab, Andrés, and Anikó Lipták. 2016. Movement and deletion after syntax: Licensing by inflection reconsidered. *Studia Linguistica* 70:66–108.

Saarinen, Sirkka. 2015. Negation in Mari. In *Negation in Uralic languages*, ed. Matti Miestamo, Anne Tamm, and Beáta Wagner-Nagy, 325–352. Amsterdam: John Benjamins.

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