Postsyntactic Reordering in the Mari Nominal Domain

Evidence from Suspended Affixation

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We argue that the unusual morphological template in the noun phrase of Meadow Mari should be derived on the basis of an underlying structure that is consistent with standard assumptions about DP syntax and the Mirror Principle. The analysis we propose derives the actual surface order of morphemes in Mari by means of two postsyntactic reordering operations: A lowering operation and a metathesis operation. Evidence for this account comes from a process called Suspended Affixation. This process is known to delete the right edges of non-final conjuncts under recoverability. We show however, that Suspended Affixation in Mari does not apply to the right edges of surface orders. Rather, the right edges of an intermediate postsyntactic representation are relevant. Thus, the account we present makes a strong argument for a stepwise derivation of the actual surface forms and thus for a strongly derivational architecture of the postsyntactic module.

1 Introduction

A number of theories of morphology act on the assumption that the internal structure of words is generated by the rules of syntax. It follows that this internal structure should reflect the order of syntactic heads. This assumption is made explicit in Baker's (1985)

Mirror Principle.[1]   And since certain aspects of syntax such as the order of syntactic heads is sometimes thought of as universal, this raises the question whether all possible orders of morphemes in the world's languages can or should be derived on the basis of an underlying universal syntactic structure. The discussion that pursued this question prominently featured a number of different topics such as the variation of morpheme orders inside a word. Cases of this sort are found with derivational affixes in the Bantu verbal system (see e.g. Hyman 2003, Good 2005, McPherson & Paster 2009, Myler 2013a) or with inflectional prefixes in languages like Chintang (Bickel et al. 2007).

Another challenge for the Mirror Principle are cases in which the order of morphemes is fixed but does not correspond to the general assumptions about syntactic structure. Such cases are quite common though, of course, not as common as one would expect under the assumption of unrestricted ordering possibilities (see Speas 1994). Famous examples are found in the verbal domain of some Athabaskan and Uto-Aztecan languages where the order of tense, aspect, agreement morphemes and verbal stems seems to violate the standard assumptions of structure building (at least at first sight (see Speas 1994, Rice 2000, Harley 2010)).

In this paper, we discuss a case that combines aspects of both of these challenges. The order of morphemes in the Mari nominal domain allows for free variation to a certain extent but, in addition, requires certain orderings of morphemes that are not expected under the standard assumptions about the syntax of noun phrases. In this article, we give a strong argument that all of the possible orders should nevertheless be derived on the basis of the standardly assumed underlying syntactic structure. The surface order of morphemes in Mari will be the result of a number postsyntactic morphological reordering rules.

Evidence for the application of these rules comes from a process called Suspended Affixation. This process, frequently found in Turkic languages, deletes the right edges of conjoined noun phrases under recoverability. In Mari, however, we can observe that Suspended Affixation does not delete the right edges of the surface order but rather the right edges of an underlying representation at a certain point of the derivation. It is only because this underlying representation can be obscured by subsequent operations that Suspended Affixation in Mari and Turkish seem to behave differently. These data thus show the necessity for the existence of (i) underlying representations corresponding to the standard assumptions about syntax, (ii) postsyntactic rules of morpheme reordering and (iii) a derivational conception of the postsyntactic module.

We will proceed as follows: In Section 2, we will discuss some of the basic features of the Meadow Mari language and the possible and impossible morpheme orders we find in the nominal domain. In Section 3, the phenomenon of Suspended Affixation in Mari will be laid out and compared with its analog in Turkish. Section 4 will provide the analysis to capture the morpheme orders in Meadow Mari and their (in)ability to delete under

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[1]While the Mirror Principle was originally conceived of as applying only to syntactic operations such as passivization, it has often been generalized to include all affixes to reflect the order of syntactic heads (see e.g. Brody (2000 et seq.)'s notion of what he calls the 'Mirror Generalization'). Given a modern Chomskyan architecture of syntax with MERGE as the only syntactic operation available, the original Mirror Principle and the generalized version are to be seen as equivalent.

Suspended Affixation. In Section 5, we show that the analysis presented in Section 4 is corroborated by facts about allomorphy and suppletion. Also, it will be shown that these facts allow for a refinement of the definition of Suspended Affixation. Section 6 will discuss the observed Duke-of-York derivation from a more abstract point of view and, on the basis of this discussion, illustrate the need for a derivational postsyntactic module. Also, we will briefly discuss alternative accounts and come back to Suspended Affixation in Turkish. Section 7 will conclude the discussion.

2 The Meadow Mari Nominal Domain

Mari, also known as Cheremis, is an Eastern Uralic language spoken mainly in the Mari El Republic, Russia. Like most of the other members of the Volgaic and Permic language families, it is quite rigidly SOV. Word formation is highly agglutinating in these languages and the specific morpheme orders vary from language to language. Even within one language such as Mari, the various dialects exhibit a number of differences (see e.g. Alhoniemi 1993 and Luutonen 1997). In this paper, we focus on the dialect of Mari spoken in the capital of Mari El Republic, Yoshkar-Ola. We will follow Luutonen (1997), who calls this dialect Meadow Mari. The two other dialects which both have significantly less speakers are called Hill Mari, spoken further in the west of the republic, and Eastern Mari.

In the following, we illustrate the main characteristics of the Meadow Mari nominal morphology. Other properties of the language are discussed along the way. In the noun phrases of Meadow Mari, determiners are usually the first elements followed by numerals, adjectives and the head noun in that order. If a numeral precedes the head noun, the latter does usually not bear additional plural marking. An example is given in (1):

(1)   Nine kok kugu olmna.
        DEM two big apple
        'These two big apples.'[2]

Possessors, which always bear genitive, occur in the same position as demonstratives:

(2)   Petry-n   kok ušan ŭdyr-že.
        Peter-GEN two clever daughter-3SG.POSS
        'Peter's two clever daughters.'

The head noun itself can be inflected for plural number, the person and number features of its possessor and for case. Like all of the members of the family, Mari has a wide range of different cases.[3] Interestingly, these cases do not show uniform behavior with respect to the order of morphemes. Local cases precede the possessive affix while structural cases

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[2]All examples from Meadow Mari are, unless otherwise stated, provided by the second author a native speaker of Meadow Mari from Yoshkar-Ola.

[3]We will, at this point however, not engage in the discussion about how many there really are and whether they can and should be analyzed as formally different from postpositions. See Alhoniemi (1993) on Mari and Moravcsik (2003), Trommer (2008), Spencer (2008) on the same issue in Hungarian.

follow it. In the neighboring language Udmurt, which allows for case stacking to a certain extent,[4] we can see both case slots show up in the same example. In (3), we can see that the instrumental in Udmurt precedes the possessive affix whereas the ablative, which counts as a structural case in Udmurt, follows the possessive affix.

(3) Mon Petr-en   pinal-jos-ini-m-les'   mözmi-s'ko.
     1SG Peter-INST child-PL-INST-1SG-ABL miss-PRS.1SG
     'I miss Peter and my children.'   Udmurt[5]

In Mari, we can see the two different positions for case in the template in minimal pairs such as the one below:

(4) pasu-vlak-ešte-na   (5) pasu-vlak-na-m
     garden-PL-INESS-1PL.POSS   garden-PL-1PL.POSS-ACC
     'in our gardens' (INESSIVE)   'our gardens (ACCUSATIVE)'
                                                                         Meadow Mari

It is to be noted though that this classification as structural vs local case is a strong oversimplification. What we find is that under this notion the genitive, the accusative, the comitative count as structural whereas the other cases are local cases. According to Alhoniemi (1993), there is variation as to whether the dative and comparative precede or follow the possessive affix. We treat them both as structural cases as they always follow the possessive affix in our examples.

This alternation is, however, not the only thing that is unusual about the order of morphemes in the nominal template of Meadow Mari. We also find that the order of the plural suffix /-vlak/ and the possessive affixes is not fixed. Usually, both orders are acceptable.

(6) pasu-vlak-na   (7) pasu-na-vlak
     garden-PL-1PL.POSS   garden-1PL.POSS-PL
     'our gardens'   'our gardens'
                                                                         Meadow Mari

Given these two independent kinds of alternations in the Meadow Mari nominal template, we end up with quite a number of different possible orders. Crucially, however, not all possible orders are attested. The following table summarizes the possible orders of morphemes in the Meadow Mari nominal template. The ones not included in the table are ungrammatical. The first column gives the order of the affixes, the second column gives the corresponding order of the syntactic categories as assumed in the following sections of this paper and the third one gives a Mari example.[6]

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[4]See however Weisser (in prep) for a discussion of these examples on case stacking in Udmurt. See Assmann et al. (2013) for an account of Udmurt case in terms of covert case stacking.

[5]This example was provided by Svetlana Edygarova, University of Helsinki

[6]The abbreviations in the second column are: # is the number morpheme, D is the location of the possessive affix, K_1 is the host of the local case features and K_2 is the host of the structural case features.

(8)   Possible orders of morphemes in the Meadow Mari nominal template:

	Affixes	Categories	Example
(a)	PL > POSS	$\# > D$	'pasu-vlak-na'
(b)	POSS > PL	$D > \#$	'pasu-na-vlak'
(c)	PL > LOCAL.CASE	$\# > K_1$	'pasu-vlak-ešte'
(d)	PL > STRUCTURAL.CASE	$\# > K_2$	'pasu-vlak-em
(e)	LOCAL.CASE > POSS	$K_1 > D$	'pasu-šte-na'
(f)	POSS > STRUCTURAL.CASE	$D > K_2$	'pasu-na-m'
(g)	PL > LOCAL.CASE > POSS	$\# > K_1 > D$	'pasu-vlak-ešte-na'
(h)	POSS > PL > LOCAL.CASE	$D > \# > K_1$	? 'pasu-na-vlak-ešte'
(i)	PL > POSS > STRUCTURAL.CASE	$\# > D > K_2$	'pasu-vlak-na-m'
(j)	POSS > PL > STRUCTURAL.CASE	$D > \# > K_2$	'pasu-na-vlak-em'

With a number morpheme and a possessive morpheme and no case (which amounts to nominative marking), both orders are possible ((8-a) and (b)). With case and number marking and no possessor, only the order [# > K] is allowed, irrespective of the case morpheme involved ((8-c) and (d)). When there is a case morpheme and a possessive morpheme but no number morpheme (which amounts to singular marking), the order depends on the case marker involved. K_1-type cases must precede the possessive whereas K_2-type cases must follow it ((8-e) and (f)). When all morphemes are attested and the case marker in question is of type K_1, the standard order is [# > K_1 > D] (8-g). However, according to Luutonen (1997), who did an extensive survey on the possible and impossible orders of morphemes in all Mari dialects, another possibility is [D > # > K_1] (8-h). The second author accepts these forms but does not produce them herself and calls them less frequent. Finally, with K_2-cases, two orders are equally acceptable. [# > D > K_2] and [D > # > K_2] are both fully grammatical and, as far as we can tell, both frequently attested ((8-i) and (j)).

Against the background of the discussion mentioned in the introduction, this raises the question whether all of this variation should be derived on the basis of a uniform syntactic structure. Of course, one can always simply assume syntactic or postsyntactic operations that change any kind of underlying structure to match the observed surface structure. But unless independent evidence for these operations can be found, they appear to mere stipulations to keep the system running. Such an approach leaves the Mirror Principle as no more than an irrefutable hypothesis that provides little if any insights on empirical data. If, however, independent evidence for either the existence of underlying structures or these syntactic or postsyntactic reordering processes can be found, the Mirror Principle remains a highly interesting and empirically relevant hypothesis and one of the core principles of the syntax-morphology interface.

In the remainder of this paper, we will present what we believe to be a very strong argument in favor of the view that all the possible surface orders in (8) are to be derived on the basis of a uniform syntactic structure of the nominal domain in Meadow Mari. The evidence for this argument will come from a process called Suspended Affixation known from Turkic languages. Suspended Affixation deletes the right edges of non-final conjuncts in conjunction under identity. Crucially, we find that Suspended Affixation does not apply to the surface structure of the order of morphemes in Meadow Mari. Rather, it

seems to apply systematically to an underlying structure that is more closely related to the standardly assumed structure of noun phrases.

3 Suspended Affixation in Meadow Mari and Turkish

3.1 SA in Meadow Mari

Unlike some languages it is immediately related to like Mordvin (see Luutonen 1997), Meadow Mari makes use of a process called Suspended Affixation (SA), typically known from Turkic languages. Possibly, this is not a coincidence as the Mari people had long been in strong contact with people speaking Turkic languages. Alhoniemi (1993), for example, notes that the Mari language has been under strong influence by the languages of the Tatar and the Chuvash.

As already mentioned in the preceding section, SA deletes the right edges of non-final conjunct in coordination if they are also found in the final conjunct. Meadow Mari has two different conjunctions to conjoin nominals, /da/ and /den/. Only the latter one triggers SA, which leaves us with nice minimal pairs such as the one in (9).

(9)   a.   Pörjeng   tej-em   da tud-em   už-eš.
           Man.NOM 2.SG-ACC and 3.SG-ACC see-3.SG.PRES
           'The man sees you and him'
      b.   Pörjeng   tej   den tud-em   už-eš.
           Man.NOM 2.SG and 3.SG-ACC see-3.SG.PRES
           'The man sees you and him'

The examples differ only with respect to the conjunction and as to whether the first conjunct underwent SA or not. In (9-a), we see that the accusative case marker /-em/ is retained on the first conjunct, in (9-b), it has been deleted. The remnant is a form, which, in this case, resembles the corresponding nominative pronoun.

In (10), we see that the process applies to all non-final conjuncts and that SA is not specific to case. Number marking can be deleted as well. The non-final conjuncts can have a plural interpretation.

(10)   Me peres,   pij   den kajek-vlak-em už-am.
       1SG cat.NOM dog.NOM and birds-PL-ACC   see-1SG.PRES
       'I see cats, dogs and birds.'
       'I see a cat, a dog and birds.'

Deletion of case markers in coordination with the conjunction /den/ is more or less obligatory (as shown in (11)). Number marking can be retained (see (12)) if the ambiguity that arises is problematic.

(11)   ??Me peres-vlak-em den pij-vlak-em už-am.
       1SG   cat-PL-ACC   and dog.PL-ACC see-1SG.PRES
       'I see cats and dogs.'

(12)   Me peres-vlak den pij-vlak-em už-am.
       1SG cat-PL   and dog.PL-ACC see-1SG.PRES
       'I see cats and dogs.'

Importantly, there is a condition that only right edges can be deleted. It is completely impossible to retain case marking but to delete number marking (cf. (11)).

(13)   *Me peres-em den pij-vlak-em už-am.
       1SG cat-ACC   and dog.PL-ACC see-1SG.PRES
       'I see cats and dogs.'[7]

As pointed out by Ershler (2012) for Ossetic and Armenian, the non-final conjuncts do not typically bear the nominative. Rather, they bear the oblique stem on the basis of which the deleted case marker is formed. In Mari, we can observe that non-final conjuncts need not bear any case.

(14)   a. Pörjeng   memnam da nunem   už-eš
           Man.NOM us.ACC   and them.ACC sees-3SG.PRES
       b. Pörjeng   memna den nunem   už-eš
           Man.NOM us.???   and them.ACC sees-3SG.PRES
           'The man sees us and them.'

The form /memna/ in (14-b) is not attested in the pronominal paradigm of Mari at all. It is simply the remnant of the actual accusative case form /memnam/ minus the accusative marker /m/. In other words, the accusative pronoun is formed with a suppletive stem /memna/ plus the accusative marker /m/. Applying SA to this pronoun leaves the suppletive stem as a remnant. If the nominative form /me/ is used in the same environment as in (15), the result is ungrammatical.

(15)   *Pörjeng   me   den nunem   už-eš
        Man.NOM us.NOM and them.ACC sees-3SG.PRES
        'The man sees us and them.'

This strongly suggests that Suspended Affixation is an ellipsis process, rather than an actual difference of feature specification on both conjuncts (see Ershler (2012) for the same conclusion).

3.2 SA in Turkish

In this section, we will compare the features of SA in Meadow Mari with Turkish and we will come to the conclusion that, as far as we can tell so far, the phenomenon behaves identical in the two languages.

SA is found in a whole range of other Eurasian languages such as Turkish (see e.g. Kornfilt 1996, Kabak 2007, Broadwell 2008), Japanese and Korean (Yoon & Lee 2005), Armenian and Ossetic (Ershler 2012) and Nivkh (Gruzdeva 1998).

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[7]In line with the example (11) above, the example in (13) is degraded with a singular reading of the first conjunct.

In (16), we see examples from Turkish that seem completely parallel to the ones in Mari. We have three conjuncts and only the final conjunct bears full marking. All non-final conjuncts have no inflection at all. Nevertheless, they are interpreted as if they were marked for plural, possessive and ablative case.

(16)   köy(...), kasaba(...) ve   kent-ler-imiz-den
         village town   and city-PL-1PL.POSS-ABL
         'from our villages, towns, cities.'   Göksel & Kerslake 2005, p.458

If deletion applies only to a subset of morphemes, the deleted morphemes must be at the right edge. The order of affixes in the Turkish noun phrase is uniformly [Stem - Num - Poss - Case].[8] Thus, the case marker can always be deleted, whereas deletion of other morphemes depends on whether there is material to the right. In (17), we see that, as in Mari, it is possible to retain the plural marker while deleting something to the right of it. In (17-a), only the case marker is deleted and in (17-b), the possessive affix is deleted. In both cases, the rightmost element is deleted whereas the plural marker to the left of it is retained.

(17)   a.   öğretmen-ler(...) ve   öğrenc-ler-le
            teacher-PL   and student-PL-COM
            'with (the) teachers and (the) students.'   Göksel & Kerslake 2005, p.458
       b.   yurt-lar, kampus-ler ve   universite-ler-imiz
            dorm-PL, campus-PL and university-PL-1PL.POSS
            'Our dorms, campuses and universities'   Kabak 2007

(18) shows that the opposite is impossible. It is ungrammatical to delete morphemes that are not at the right edge. It is not possible to retain the case marker but to delete the possessive affix (and the plural).

(18)   *kasaba-dan ve   kent-ler-imiz-den
         town-ABL   and city-PL-1PL.POSS-ABL
         'from our towns and villages'

The process of SA obeys the same restrictions in Turkish and Meadow Mari. The rightmost element can be deleted under identity and the second rightmost can only be deleted if the rightmost one is deleted as well.

A further striking similarity between SA in Turkish and SA in Meadow Mari are both restricted to inflectional affixes (see Kornfilt 1996). Derivational affixes at the right edges of non-final conjuncts cannot be deleted:[9]

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[8]In the verbal domain, Turkish has some variability of the ordering of morphemes. However, the variable affixes in question cannot undergo SA (see Good & Yu (2005)).

[9]Interestingly, we find the exact reverse situation in German where inflectional affixes cannot be deleted whereas derivational affixes and parts of compounds can. (see Booij 1985, Wiese 1996 and Barnickel & Weisser in prep)

(19) a. Kole*(-zo) den urge-zo   tul-eš   kol-en-et.
          fish-NMLZ and sew-NMLZ fire-ILL die-PAST-3PL
          'A fisher and a tailor died in the fire.'

      b. Lud*(-maš) den šotle-maš   vujdoreket-lan saj.
          Read-GER   and calculate-GER brain-DAT   good
          'Reading and Calculating is good for your brain.'   Meadow Mari

(20) fayans*(-ci) ve   baca-ci
      tile-NLMZ and chimney-NLMZ
      'The tile-layer and the chimney-sweeper'   Turkish: Kabak 2007

We can state that the phenomenon shares a great number of its properties in Meadow Mari and in Turkish.[10]

3.3 SA in Meadow Mari revisited

In the examples of SA in Meadow Mari in Section 2, we have only seen cooccurences of case and number marking. The generalizations were simple. Case is always deleted under identity and number can be deleted if case is too. Thus, the examples of SA seemed completely parallel to the Turkish ones.

If we look at examples containing a possessive affix in addition though, things become more complicated. Again, it is still possible to delete all the affixes if the possessors are identical as in (21).

(21) Nuno memnan pört   den sad-vlak-eške-na   tol-en-et.
      3PL   1PL.GEN house and garden-PL-ILL-1PL came-PAST-3PL.
      'They came to our houses and our gardens.'

However, when deleting only a subset of the affixes, we find that the right edge condition can be violated if a possessive affix is involved. In (22), we see that a local case (the inessive in (22-a) and the illative in (22-b)) can be deleted even though it is not at the right edge of its conjunct. It precedes the possessive affix which cannot be deleted as different possessors are chosen in each conjunct.

(22) a. Üder mej-en   uše-m   den tej-en   süm-ešte-t.
          girl 1SG-GEN mind-1SG and 2SG-GEN heart-INESS-2SG
          'The girl is in my mind and in your heart.'

      b. Pjötr kart-em mej-en   perdež-em den omsa-ške-že pižekta
          'Peter map-ACC 1SG.PRON-GEN door-1SG   and wall-ILL-3SG pin.3SG.PRES
          'Peter pins maps to my door and his wall.'

On an abstract level, the underlying forms of first conjuncts look like (23):

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[10]One apparent difference between SA in Turkish and in Mari is that Turkish does not allow for non-final conjuncts whose forms do not occur elsewhere in the language. As can be seen from (14) above, Mari does. We discuss this issue more closely in Section 6.3.

(23)   a.   uš-   ~~ešte~~   -m
            mind- INESS -1SG

       b.   perdež- ~~ eške~~ -m
            door-   ILL   -1SG

We can see that the local cases behave identical with the structural cases, which can be deleted just as well. This, however, is expected since they are adjacent to the right edge of the conjunct.

(24)   Me   iza-m   den aka-m-en   pörtešt-em už-am.
       1SG brother-1SG and sister-1SG-GEN house-ACC see-1SG.PRES
       'I see my brother's and my sister's house.'

Another violation of the right-edge condition can be observed with the plural morpheme. It can just as well be deleted even though it is preceding a possessive affix. Importantly, the first conjunct in (25) can have a plural interpretation (as indicated by the translation). We can thus assume that the number morpheme is deleted too. The abstract representation in (26) illustrates the deletion pattern:

(25)   A-vlak tud-en   sad-še   den memn-an pasu-vlak-ešte-na mod-et.
       child-PL 3SG-GEN garden-3SG and 1PL-GEN field-PL-INESS-1PL play-3PL.PRES
       'The children are playing in his gardens and in our fields'

(26)   sad-   ~~vlak ešte~~   še
       garden- PL-   INESS- 1PL.POSS

So, to sum up, what we find is that case markers can be deleted even though some of them are not at the right edge of the respective conjunct since they precede the possessive affix linearly. Also, we find that plural markers can be deleted even though they precede a possessive affix. Plural markers cannot be deleted if they precede a case marker that is not deleted. The following table lists the relevant combinations. (27) gives the patterns for the local K_1-type cases and (28) shows the patterns for K_2-type structural cases.

(27)   Patterns of deletion with K_1-type cases:

	1st conjunct	Judgment
(a)	stem - PL - LOC.CASE - POSS	✘
(b)	stem - PL - LOC.CASE - ~~POSS~~	✘
(c)	stem - PL - ~~LOC.CASE~~ - POSS	✔
(d)	stem - PL - ~~LOC.CASE~~ - ~~POSS~~	✔
(e)	stem - ~~PL~~ - LOC.CASE - POSS	✘
(f)	stem - ~~PL~~ - LOC.CASE - ~~POSS~~	✘
(g)	stem - ~~PL~~ - ~~LOC.CASE~~ - POSS	✔
(h)	stem - ~~PL~~ - ~~LOC.CASE~~ - ~~POSS~~	✔

Since it is only possible to conjoin noun phrases which bear the same case, the case markers in deletion contexts are always identical both in terms of morphosyntactic specifica-

tion and phonological content.[11] Thus, case is always necessarily affected by SA. Patterns where case marking was retained are uniformly ungrammatical (as in (27-a),(b),(e) and (f)). Retaining the plural even though it could be deleted is possible when an appropriate context is given (as in (27-c) and (d)). Finally, we see that irrespective of whether the possessor is deleted or not (it is deleted when it is identical and it is not deleted when it is not), deletion of the plural and the case marker is grammatical even though they are not at the right edges of the non-final conjunct.

The following table summarizes the patterns of deletion with K_2 cases.

(28)   Patterns of deletion with K_2-type cases:

	1st conjunct	Judgment
(a)	stem - PL - POSS - STRUC.CASE	✗
(b)	stem - PL - ~~POSS~~ - STRUC.CASE	✗
(c)	stem - PL - POSS - ~~STRUC.CASE~~	✔
(d)	stem - PL - ~~POSS~~ - ~~STRUC.CASE~~	✔
(e)	stem - ~~PL~~ - POSS - STRUC.CASE	✗
(f)	stem - ~~PL~~ - ~~POSS~~ - STRUC.CASE	✗
(g)	stem - ~~PL~~ - POSS - ~~STRUC.CASE~~	✔
(h)	stem - ~~PL~~ - ~~POSS~~ - ~~STRUC.CASE~~	✔

The results are completely identical. This shows that even though the different types of cases occupy different positions in the template, their deletion patterns are also completely identical. This is totally unexpected if one conceives of SA as a simple process deleting morphemes at the right edges of surface forms.

In addition, we see that in (28-g), it is even possible to delete the plural marker even though it is not at the right edge of its conjunct. While the case marker at the right edge has been deleted, the plural marker is still followed by the possessive affix. Hence, its deletion is unexpected.

So, to sum up, we see that in Meadow Mari, unlike in Turkish, non-final elements can be deleted even though final ones are retained. In one case, a local case is deleted even when it is followed by a possessive affix and in other cases, even a plural marker that is followed by a possessive affix can be deleted. This raises the question whether SA can receive a unified analysis in Mari and in Turkish.

4 The Analysis

In the previous sections, two important questions were raised. First, can or should the unusual order of morphemes in the Meadow Mari nominal template be derived on the basis of a coherent underlying syntactic structure? And second, can the phenomenon of SA receive a unified account in Turkish and Meadow Mari even though its restrictions of application seem to be different?

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[11]In Meadow Mari, as far as we know, there are no nouns which can be distinguished on the basis of their morphological paradigms (i.e. there are no noun classes in Meadow Mari).

In the following, we will propose an analysis that allows for a unified analysis of Suspended Affixation in Mari and Turkish *and* allows the standard assumptions about DP syntax and the Mirror Principle to be maintained. We will show that assuming an underlying uniform representation of some sort will actually allow for an analysis of the deletion patterns in a completely straightforward way. From a different perspective, it can thus be argued that the existence of deletion patterns of SA such as the ones in Mari provide a very strong argument for a uniform underlying syntax and the Mirror Principle.

The idea of the analysis is that the underlying syntax of noun phrases in Meadow Mari follows standard assumptions and that the output of the syntax is however changed in the postsyntactic component by two rules: A lowering rule and a metathesis rule. We will show that if we set up a derivational theory of postsyntactic rule application in which the lowering rule feeds the application of SA whereas the metathesis rule counterfeeds (i.e. follows) the application of SA, then the deletion patterns as well as the order of morphemes is predicted correctly.

4.1 Assumptions

In this section, we will briefly outline our basic assumptions. We will start out with the assumptions about the syntax of noun phrases in Meadow Mari. As said above, we will assume what we believe to be rather standard assumptions about NP/DP/KP-syntax. Following McFadden (2004), we assume that the underlying syntactic hierarchy is the one in (29).[12]

(29) $[_{KP} [_{DP} [_{\#P} \text{ NP } \#] \text{ D }] \text{ K }]$

The elements in (29) are the ones relevant for the discussion in this article. However, there can, of course, be additional projections which are in between the categories in question. For the sake of this article the categories sketched in (29) will suffice as they represent all of the actual morphemes that are involved in the reordering processes we investigate in this article: The #-head represents the number features which modify the NP immediately. A plural feature on # will result in the morpheme /-vlak/ unless the #-head's specifier is filled with an overt numeral. The D-head hosts what we called the possessive affix in the previous sections. These morphemes realize features which are the result of D agreeing with the possessor in its specifier. Finally, we assume that the whole structure is headed by a K-head which hosts the case marker. We believe this to be a plausible analysis because (i) the case marker modifies the whole DP and not just parts of it, (ii) it is the nature of the K-head which determines the distribution of the whole

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[12]Apart from McFadden (2004), there are, of course, many predecessors to the underlying structure we assume. The general archictecture of DPs with a D-head taking an NP as its complement goes back to Abney (1987) and was adopted by most accounts in the field. The intermediate number head was introduced by Ritter (1992) and argued for by a number of papers, i.a. Alexiadou & Wilder (1998); Harley & Ritter (2002). Introducing a K-head heading the whole structure was proposed i.a. by Travis (1986); Travis & Lamontagne (1992); Bittner & Hale (1996); Bayer et al. (2001). And, as for the position of K, it is very plausible to assume that K modifies the whole DP rather than just a constituent of it. This insight goes back to a whole number of accounts which stress the similarities of case and adpositions. (see e.g. Kayne 1984, Emonds 1985)

phrase in the clause and (iii) it puts case markers on the same level as postpositions. And especially in Finno-Ugric languages, it has long been noted that there is probably not a good reason to distinguish between case markers and (at least some kinds) of postpositions (see Moravcsik 2003, Trommer 2008, Spencer & Stump 2013).

Another assumption that we make for the sake of concreteness is that the nominal complex investigated throughout this paper is not formed by head-movement. Rather, all of the heads in question cliticize to the nominal stem postsyntactically. We do not want to delve too deeply into the discussion about the distinction between affixes and clitics in Finno-Ugric but, as far as we can see, already the mere number of different morpheme orders in many areas of Finno-Ugric suggests that many elements in the nominal (and possibly also the verbal domain) in these languages are syntactically relatively free. Also, the extreme degree of concatenation with hardly any cases of allomorphy point into direction of clitics rather than affixes. Hence, we assume all of the morphemes to be syntactic heads which concatenate postsyntactically – possibly as a result of phonological deficiency. Anyway, we want to emphasize that, for the sake of this paper, hardly anything hinges on this decision. If head movement creates ordered sets of features (as opposed to throwing all the features of the single heads into one unordered set), then the analysis that we propose in the following sections can proceed as it stands.

The next crucial assumption of our analysis is that there are several postsyntactic operations that manipulate the output of the syntax. Some of them apply on the basis of syntactic hierarchy, others apply on the basis of structures that have already been linearized. We discuss these operations in their order of application:
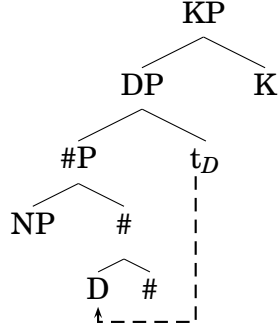
① Lowering of D (D-L):[13]

D-L is a postsyntactic process that lowers D to left-adjoin to # (as in (30)). The same process has already been proposed in McFadden (2004) to account for the Eastern Uralic nominal template. In accordance with Embick & Noyer's (2001) *Late Lowering Hypothesis*, D-L follows all kinds of syntactic movement. Still, however, it applies on the basis of hierarchical structure (i.e. prior to linearization).[14] Thus, it must precede the other postsyntactic operations that we assume.

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[13]On lowering, in general, see e.g. Embick & Noyer 2001, Myler 2013b, Arregi & Nevins 2012, Salzmann 2013.

[14]I follow McFadden (2004) who gives an argument for this process applying on the basis of hierarchical structure. The argument itself is based on allomorphy patterns in Mordvin, another Eastern Uralic language. Thus, while this assumption may lack concrete support within Meadow Mari, it combines nicely with the rest of the analysis and the general order of operations discussed below.

(30) Lowering of D to #:

```
                    KP
                  /    \
                DP      K
               /  \
            #P     t_D
           /  \     ¦
         NP    #    ¦
              / \   ¦
             D   #  ¦
             ↑__ __ _¦
```

D-L is an optional process. Therefore it derives the free alternation between the examples in (31) and (32).

(31) pasu-vlak-na   (32) pasu-na-vlak
      garden-PL-1PL.POSS   garden-1PL.POSS-PL
      'our gardens'   'our gardens'

② Suspended Affixation SA: (*preliminary*)

SA deletes the features of a head at the right edge of a KP if the features are recoverable in the final conjunct (as in (33)).

(33) [α   β   γ] & [α   β   γ]
         | | | | | |
       {F1} {F2} {F3}   {F1} {F4} {F3}

      $\overrightarrow{\text{SA}}$ [α   β   γ] & [α   β   γ]
                | | | | | |
              {F1} {F2} {F3}   {F1} {F4} {F3}

SA applies in the presence of the conjunction /den/ and deletes all the features of a head at the right of the non-final conjunct. In (33), we see that {F3} has been deleted since it is recoverable. {F1}, however, has not been deleted even though it potentially is recoverable. The reason is that it is followed by a feature {F2} that cannot be deleted.[15]

The operation SA is obligatory.[16] As can be seen from the domain of application and the fact that it makes reference to linear order (i.e. the right-edge condition on SA), SA applies to linearized structures. Note that this notion of SA is preliminary and will be refined in Section 5.

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[15]Under this solution, deletion is carried out leaf-by-leaf rather than in terms of deletion of whole branches in the tree (as in Merchant (2001) et seq). See also Murphy (2015) for arguments that a solution along these lines might be favorable with purely syntactic phenomena like Gapping.

[16]As pointed out in Section 3, non-application of SA may actually not result in strong ungrammaticality but rather in degradedness of some sort.

③ D-Metathesis (D-M):

Changes the order of D and a K-head bearing a local case feature (and possibly an intervening #). D-M is obligatory and applies to linearized structures.

(34) D-Metathesis (formulated in Harris and Halle's (2005) Generalized Reduplication formalism):

    1.Structural description: $[_{KP}$ NP D X K
                                                                 |
                                                          {case:LOC}

    2.Structural change:

      i. Insert ⟦ to the immediate left of D and ⟧ to the immediate right of K.

      ii. Insert ⟩⟨ to the immediate right of D.

Under this definition, X can be empty. In this case D and K simply change their order. Or X can be the #-head. In this case, D is moved to the right edge of the KP leaving the order of # and K as it is. The effects of (34) are abstractly shown in (35):

(35) NP D # K ⇒
      NP ⟦ D ⟩⟨ # K ⟧ ⇒
      NP - D # K - D # K ⇒
      NP # K D

The whole string D > # > K is reduplicated and in the sense of Harris & Halle (2005), subsequently, parts of both copies are deleted. In doing so, D-M thus derives the alternation between local cases which precede the D-head and structural cases which follow it.

(36) pasu-vlak-ešte-na   (37) pasu-vlak-na-m
      garden-PL-INESS-1PL.POSS   garden-PL-1PL.POSS-ACC
      'in our gardens' (INESSIVE)   'our garden (ACCUSATIVE)'

In order to do that, the definition of D-M contains a reference to the local case feature on the K-head.[17] As a result, the order of local cases and D is inverted whereas the order of structural cases with respect to D is not affected.

Given a derivational concept of the postsyntactic module, these operations can now be ordered with respect to each other. However, since they apply on the basis of different

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[17]In case the reader might consider this reference to a certain feature as overly unrestrictive, we want to propose an alternative account that introduces an additional postsyntactic operation called K-fission (K-F). K-F splits up the features on K into two distinct heads K_1 and K_2, the former containing all local case features and the latter containing structural case features. As a result, one could reformulate D-M to the extent that it merely refers to K_1. This may have the additional benefit of being able to explain cases as the Udmurt example (3) in Section 2, in which actual stacking of a local and a structural case occurs.

kinds of structure, two additional operations must be considered: Linearization (LIN) and Vocabulary Insertion (VI). The order that we propose for the derivations in Meadow Mari is the following:

(38)   Order of Operations:
        D-L > LIN > SA > D-M > VI

To a certain extent, this ordering falls out from the assumptions about the architecture of the postsyntactic module as laid out in Arregi & Nevins (2012). Operations that apply on the basis hierarchical structure must apply early (i.e. prior to linearization) whereas those that apply on linear structures come late. The order in (38) can thus be seen as intrinsic, at least to a certain extent. We will discuss this issue in more detail in Section 6.1.

In the following sections, we will show that given this order of operations, it is possible to derive (a) the possible and impossible morpheme orders of Eastern Mari and (b) the (in)ability to delete under SA.

4.2 Deriving the possible orders of morphemes

In this section, we will illustrate all the relevant derivations step by step in order to show that they derive the correct orders of the morphemes and only the correct ones. In order to do that, we must consider the syntactic output as well as the effects of the two postsyntactic processes that manipulate the linear order: D-L and D-M. The syntactic output is uniform. The hierarchical structure the syntax ships off to the PF-interface always has the following form:

(39)   Syntactic Output Structure:
        $[_{KP} [_{DP} [_{\#P} \text{ NP \# }] \text{ D }] \text{ K }]$

This hierarchical structure serves as an input to the postsyntactical operations. Based on this structure, we can now apply D-L and D-M to see whether our analysis derives the facts. We start with simple examples with two overt morphemes:

(40)   Number and Possessive:

	Input	D-L	D-M	Output
a)	NP - # - D	✗	✗	NP - # - D
b)		✔	✗	NP - D - #

The relevant hierarchical structure that serves as an input to the postsyntactical derivation is of the form $[_{DP} [_{\#P} \text{ NP \# }] \text{ D }]$. A covert K, which amounts to nominative, does not play a role in this derivation since nominative, of course, does not have a local case feature and thus cannot trigger D-M. Since D-L is optional, we have to consider two derivations: The one in which D-L applies and the one in which it does not. Since, as we said above, there is no local case feature in the structure, D-M cannot be triggered and hence, the optionality of D-L leads to two different surface forms. If D-L does not apply the input structure is maintained (40-a) and if D-L does apply as in (40-b), it changes the order to [NP - D - #].

Next, we consider combinations of possessive affixes and case markers. The conjuncts in this configuration are, by assumption, singular. Thus the #-head has no covert marking and hence, D-L has no effects (i.e. it is string-vacuous). However, depending on the actual case features involved, D-M can apply. If K has a local case feature as in (41-a), then D-M applies and changes the order to [NP - K - D]. If K is a structural case, neither operation applies, and the result is identical to the input structure (41-b).

(41)   Possessive and Case:

	Input	D-L	D-M	Output
a)	NP - D - K_{local}	✗	✔	NP - K_{local} - D
b)	NP - D - $K_{structural}$	✗	✗	NP - D - $K_{structural}$

Next, we consider combinations of number and case. Since, by assumption the conjuncts do not have possessors, D in this case is covert. Thus, neither D-L nor D-M change the order of morphemes since both make reference to D. Hence, the only possible order is the order already present in the input [NP - # - K].

(42)   Number and Case:

	Input	D-L	D-M	Output
a)	NP - # - K	✗	✗	NP - # - K

Finally, we turn to the more interesting cases where all three morphemes are overt. In (43) and (44), an additional intermediate representation is given to illustrate the order of morphemes at the point of the derivation after D-L and before D-M. In (43), the possible derivations with a local case are shown. The local case head is abbreviated as K_1 for ease of exposition.

(43)   Number, Possessive and Local Case:

	Input	D-L	Intermediate	D-M	Output
a)	NP - # - D - K_1	✗	NP - # - D - K_1	✔	NP - # - K_1 - D
b)	NP - # - D - K_1	✔	NP - D - # - K_1	✔	NP - # - K_1 - D

Since D-L is optional, it can either leave the underlying order [NP - # - D - K] unchanged as in (43-a) or it can change it to [NP - D - # - K] as in (43-b). Subsequently, D-M will apply since its context is given (i.e. there is a local case feature on K). Irrespective of whether D-L applied in the first place, D-M will change the order to [NP - # - K - D]. In the case of (43-b), D-M undoes the effects of D-L completely, leading to a Duke-of-York effect that will become important in the following section about the deletion patterns.

In (44), we see the respective combinations with a structural case feature on K (here abbreviated as K_2). Again, the optional operation D-L gives two possible intermediate representation but this time, since the context for D-M is not given, these two orders are maintained in the actual output. With structural cases, you have both options [NP - # - D - K] and [NP - D - # - K].

(44)   Number, Possessive and Structural Case:

	Input	D-L	Intermediate	D-M	Output
c)	NP - # - D - K_2	✗	NP - # - D - K_2	✗	NP - # - D - K_2
d)		✔	NP - D - # - K_2	✗	NP - D - # - K_2

So far, the interaction of D-L and D-M could successfully derive the possible orders of morphemes. A final note is in order however about the order [NP - D - # - K_{local}]. In (8) back in Section 2, it was noted that the second author accepts this order but would not actively use it herself. Luutonen (1997) also notes this order as possible. Moreover, Luutonen notes that this is the only possible order in the neighboring dialects of Eastern Mari. These dialects do not allow for the option [NP - # - K_{local} - D]. As the reader may confirm from the tables above, we have so far not been able to derive this order. What we want to propose however, is that the dialects in which this order is possible (or even obligatory), D-M has a slightly different definition. If, in these dialects, D-M is restricted metathesis of adjacent morphemes, then the right order is predicted. Take a look at the revised definition of D-M below:

(45)   Local D-Metathesis:

        1.Structural description: [$_{KP}$ NP D K

                                |

                           {case:LOC}

        2.Structural change:

            i. Insert ⟦ to the immediate left of D and ⟧ to the immediate right of K.

            ii. Insert ⟩⟨ to the immediate right of D.

The only difference between the local and the non-local definition is that the local one in (45) does not allow for metathesis across an intervening X. The result is that local D-M can be bled by the prior application of D-L because D-L can lead to # intervening between D and K.

(46)   Local D-M bled by D-L:

Input	D-L	Intermediate	D-M$_{local}$	Output
NP - # - D - K_1	✔	NP - D - # - K_1	✗	NP - D - # - K_1

In (46), the definition of D-M is not met because there is an intervening category. Hence, metathesis is bled and we can actually see the effects of D-L on the surface.

    We can thus see that the interaction of the two operations that change linear order of morphemes can derive all of the attested ordering patterns and exclude the non-attested ones. In the next section, we will see that it also makes the right prediction concerning deletability.

4.3 Deriving the deletion patterns

In this section, we will go through the derivations again, and see which structure is present at the point when the SA operation applies. Given the order of operations in (38)

(repeated below), we make the following prediction. Since SA applies between D-L and D-M, we expect that D-L can actually feed or bleed SA whereas D-M cannot.

(47)   Order of Operations:
    D-L > LIN > SA > D-M > VI

We make the prediction, that the ability to delete is determined at the point of the derivation when D-L has already applied but D-M has not. This point of the derivation is exactly the one called *intermediate* in the tables in the preceding section. In the following, we will go through all of the combinations again and test which subsets of the morphemes can be deleted. Only deletion of a proper subset gives an indication of the underlying structure. It is always possible to delete all morphemes under identity and as shown above in Section 3, case must necessarily be deleted.

In cases of number and possessive affix, as in (40), the intermediate representation is either [NP - # - D] or [NP - D - #]. Accordingly, we can delete both elements respectively if they are at the right edge:

(48)   a.   sad-še   den pasu-na-vlak
              garden-3SG and field-1PL-PL
              'his gardens and our fields'   Deletion of # but not of D.
        b.   sad-vlak   den pasu-vlak-na
              garden-PL and field-PL-1PL
              'our gardens and fields'   Deletion of D but not of #.

In cases of possessive affixes and case (41), the intermediate representation is always [NP - D - K], irrespective of the case involved. Accordingly, we can always delete cases.

(49)   a.   Üder mej-en   uše-m   den tej-en   süm-ešte-t.
              girl   1SG-GEN mind-1SG and 2SG-GEN heart-INESS-2SG
              'The girl is in my mind and in your heart.'
                                                    Deletion of K_{local} but not of D
        b.   Me iza-m   den aka-m-en   pörtešt-em už-am.
              1SG brother-1SG and sister-1SG-GEN house-ACC see-1SG.PRES
              'I see my brother's and my sister's house.'
                                                    Deletion of $K_{structural}$ but not of D

In cases of number and case, neither D-L nor D-M applies. Thus, the deletion pattern observes the right edge condition.

(50)   Me peres-vlak den pij-vlak-em už-am.
        1SG cat-PL   and dog.PL-ACC see-1SG.PRES
        'I see cats and dogs.'   Deletion of K but not of #

We now turn to cases with three affixes, where the deletion patterns are the most interesting ones. With local cases, the intermediate representation is either [NP - # - D - K] or [NP - D - # - K]. In both structures, the right elements can be deleted. That means, that even though we get identical surface structures, we find different deletion patterns.

(51) A-vlak   tud-en   sad-še   den memn-an pasu-vlak-ešte-na   mod-et.
      child-PL 3SG-GEN garden-3SG and 1PL-GEN field-PL-INESS-1PL play-3PL.PRES
      'The children are playing in his gardens and in our fields'

                                          Deletion of K and # but not of D

(52) Nuno memna-n pört-vlak den sad-vlak-eške-na   tol-en-et.
      3PL   1PL-GEN house-PL and garden-PL-ILL-1PL come-PAST-3PL
      'They came to our houses and our gardens.'

                                          Deletion of K and D but not of #

With structural cases, we get the same two intermediate representations. Hence, we expect the same deletion patterns. This prediction is borne out.

(53) Tudo oksa-m   šole-ž   den šüžar-že-vlak-lan pu-en.
      3SG   money-ACC brothers-3SG and sister-3SG-PL-DAT give-3SG.PAST
      'He gave money to his brothers and his sisters.'

                                          Deletion of K and # but not of D

(54) Me memna-n peres-vlak den pij-vlak-na-m   už-am.
      1SG 1PL-GEN cat-PL   and dog-PL-1SG-ACC see-1SG.PRES
      'I see our cats and dogs.'

                                          Deletion of K and D but not of #

4.4 Interim Summary

In the previous sections, we have shown in detail that the possible orders of morphemes can be derived by means of two distinct operations (D-L and D-M). D-L optionally lowers the D-head to #, which leads to a change in the linear order of the two. D-M, however, obligatorily moves the D-head to the right edge of the template if its context is given. The effects of both operations can be observed independently. However, they can also interact in intricate ways.

In doing so, these two operations can also account for the complex deletion patterns. When interleaved with another postsyntactic process, namely SA, these operations account for opaque deletion patterns. With some of them, the right edge condition is seemingly violated. These are accounted for by the assumption that SA is counterfed by D-M thus creating the illusion that something other than a right edge has been deleted. In other cases, it even seems that non-continuous strings can be deleted. These data are accounted for by the Duke-of-York derivation in which both, D-L and D-M apply derivationally. The difference is that D-L crucially feeds SA whereas D-M counterfeeds it. In these cases, the representation which serves as a basis for deletion is neither identical with the input structure nor with the output structure. Thus, these data provide a very strong argument for intermediate representations.

In the following section, we will briefly address some interesting cases of allomorphy and suppletion in order to test some predictions of the analysis and in order to refine the technical implementation of SA. Then, in Section 6, we will take a step back and discuss more general implications of the analysis.

5 Allomorphy and Suppletion

In this section, we will present some more data from Meadow Mari involving allomorphy and suppletion that support the present analysis and allow for a refinement of the technical implementation of Suspended Affixation.

Finno-Ugric languages are known to exhibit very few instances of allomorphy. Nominal and verbal affixes usually have only one form which does not change in different grammatical contexts. Often, these affixes are even syncretic across whole domains. The possessive affixes, for example, that we have have discussed throughout this article, carry over directly to the verbal domain where they encode the subject features. In Section 4, this has been taken as one argument that these affixes should in fact be treated as clitics.

One instance of allomorphy however, that one finds in Meadow Mari concerns the illative case marker. The form of the illative case marker is sensitive as to whether it is followed by D or not (see examples in Alhoniemi 1993). Consider the following minimal pair.

(55)   oms-aške / oms-aš
        door-ILL
        'to a door'

(56)   oms-aške-m   / *?oms-aš-em
        door-ILL-1SG
        'to my door'

If the illative marker is not followed by D, it can either be /eške/ or /eš/. If it is followed by a possessive affix, the latter is not an alternative. The case form /eš/ is not available.

In more technical terms, the vocabulary insertion into K$_1$ is sensitive to whether D-M has applied or not. This is expected since D-M precedes vocabulary insertion (VI). We can thus formulate the insertion rules for the illative marker as follows:

(57)   ILLATIVE   →   -eške /_ D[pers:α,#:β]]

(58)   ILLATIVE   →   -eške *or* -eš

If D has any person features (i.e. if there is a possessor which it has agreed with), then the illative marker must have the form -eške. In all other cases, free variation between both forms is possible.[18]

An interesting instance of suppletion is found with some plural pronouns in Meadow Mari. Most pronouns follow a simple pattern with a uniform stem and the respective case markers. The first and second person plural pronouns however follow a different pattern known from other languages of the family such as Hungarian (see Spencer & Stump 2013). With this pattern, some of the cases (i.e. the accusative, the genitive

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[18]As it does not affect our main point here, we leave aside the question whether this free variation can be derived more satisfyingly (e.g. by saying that, for some speakers, even unvalued (i.e. phonologically empty) D is enough to trigger the form -eške.) To substantiate such claims, more data from a variety of different speakers would be necessary.

and the dative) undergo stem suppletion.[19] The table in (59) illustrates the pronominal pattern for first and second person plural.

(59)   Pronominal Paradigm of 1PL and 2PL in Meadow Mari[20]

	1PL	2PL
NOMINATIVE	me	te
GENITIVE	memna-n	tenda-n
ACCUSATIVE	memna-m	tenda-m
DATIVE	memna-lan me-lan-na	tenda-lan te-lan-da
COMITATIVE	me-ge	te-ge

Alhoniemi (1993:79)

Based on this observation, we may now create contexts in which the case marker that triggers suppletion is deleted under SA. We have seen the resulting examples already in Section 3. They served us as an argument for the deletion approach since the suppletion is triggered even though the case marker is deleted:

(60)   Pörjeng   memna den nunem   už-eš
         Man.NOM us.???   and them.ACC sees-3SG
         'The man sees us and them.'

In (60) we see that if a first person pronoun is the first conjunct of a conjoined direct object (bearing the accusative), SA leaves just the suppletive stem as a remnant.
This shows that VI is sensitive to features that are deleted by SA. This is not expected under the present analysis. SA precedes VI and if SA really deletes the features in question as assumed in Section 4 above, then VI could not be sensitive to these features.
In order to solve this dilemma, we would like to refine the definition of SA saying that it rather marks certain heads for zero-insertion rather than actually deleting the features on these heads.

(61)   Suspended Affixation SA: (*final*)
         Marks heads at the right edge of a KP for zero-exponence if their features are recoverable in the final conjunct (as in (62)). Applies to linearized structures.

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[19]The suppletive form of the first person plural pronoun in these cases derives from a stem /mem/ plus the affix /na/ which is the possessive marking for first person plural. The fact that pronouns bear possessive marking is a widespread phenomenon in Finno-Ugric (see e.g. Spencer & Stump (2013) on Hungarian). Historically, it is due to the fact that case markers once were nouns which could themselves bear possessive affixes. In Hungarian, for example, this pattern seems to be productive but in Mari, these forms are lexicalized and simply treated as suppletive stems.

[20]Pronouns do normally not inflect for local cases. Instead either postpositional constructions or periphrastic constructions 'someone like me' are used.

(62)   [α β γ] & [α β γ]
      | | | | | |
   {F1} {F2} {F3}   {F1} {F4} {F3}

$\overrightarrow{\text{SA}}$ [α β $\gamma_\emptyset$] & [α β γ]
       | | | | | |
     {F1} {F2} {F3}   {F1} {F4} {F3}

In (62), SA does not delete the features in question. Rather, it marks certain heads (in this case γ) for zero-insertion. This is illustrated by subscript $\emptyset$. Formulating SA this way solves the problem because the feature that triggers suppletion is not deleted at the point of VI. The head that bears the feature that triggers suppletion is marked for zero-insertion. Thus, at the point of VI, the feature can still trigger suppletion and its head is realized with a zero exponent.

6 General discussion

In this section, we will review some of the points raised in the previous sections and illustrate some of the greater implications of this analysis.

6.1 The importance of the sequential derivation

The present analysis makes use of an extremely derivational concept of the postsyntactic module as laid out in Arregi & Nevins (2008, 2012). The operations that apply in the Meadow Mari nominal domain must necessarily apply in a fixed order to obtain the correct results. It is crucial that they cannot apply at the same time or even be unordered with respect to each other. The order must be exactly as shown in (38), repeated below:

(63)   Order of Operations:
      $\boxed{\text{D-L}}$ > $\boxed{\text{LIN}}$ > $\boxed{\text{SA}}$ > $\boxed{\text{D-M}}$ > $\boxed{\text{VI}}$

Given the derivational modular concept of the postsyntax as laid out in Arregi & Nevins (2008, 2012), the order of these operation is mostly intrinsic. In the system they argue for, the hierarchical structure, which is the output of the syntax, is transformed step by step into a linear string. In the course of this transformation the structure goes through several modules each of which has its own rules and operations. Rules that apply on the basis of hierarchical structure must precede rules that apply on linear order. In the case at hand, this means that D-L must precede SA and D-M. Given the latter two both apply to linear orders, their ordering is in principle free. However, as we see from the data, SA must precede D-M derive the data correctly. These two operations must thus be ordered extrinsically.

The strongest point in favor of the order we assumed is made by the Duke-of-York derivation we discussed in Section 4. Both operations that play a role in this derivation are independently accounted for as their effects are different. However, only a derivational system with ordered operations makes the right predictions when it comes to the

interaction of these operations. The can interact to the extent that D-M may completely undo all the effects of D-L. This, as far as we see, is the only way to account for the complex deletion patterns where, seemingly, a non-continuous string is deleted.

(64) Duke-of-York derivation:[21]

   Input: NP -   # -   D - K_1 $\overrightarrow{\text{D-L}}$
            NP -   D -   # - K_1 $\overrightarrow{\text{SA}}$
            NP -   D -   #̸ -   K̸$_1$ $\overrightarrow{\text{D-M}}$
   Output: NP -   #̸ -   K̸$_1$ -   D

A subset of the affixes is deleted by SA. Importantly, this subset is neither at the right edge at the input structure nor at the right edge of the output structure of the derivation. Furthermore, it is not even a continuous string. Nevertheless it can be deleted (as in (51)) above. The reason, that we have emphasized several times by now, is that it is an intermediate representation that serves as input for SA.

   The Duke of York derivation is, as far as we can see, the only way to account for this deletion pattern and to maintain the well-established right-edge condition on SA (see the next section). Importantly, this derivation is facilitated by the derivational model of grammar and, in particular, the derivational fashion in which the postsyntactic module applies.[22]

   For this reason, a representational account of the data in Mari is, as far as we can see, bound to fail. Ryan (2010) presents an optimality-theoretic approach to variable affix orders that can derive the affix order of Meadow Mari. In his account, the order of affixes is determined by means of constraints that evaluate the pairwise order of affixes. In the case at hand, the evaluation could look like the following:[23]

---

[21]The term 'Duke-of-York derivation' goes back to Pullum (1976) and describes a derivation in which a process B undoes the effects of a previous process A completely.

[22]Another fact that puts emphasis on the derivational model that underlies the analysis is the violation of the Obligatory Precedence Principle, which states that obligatory rules must precede optional rules (Ringen 1972; also cf. Perlmutter & Soames (1979); Georgi (2014)). As we have seen, D-L is optional and precedes several obligatory operations such as D-M. However, as was made clear in the discussion above, the order of these operations must be the way we presented it.

   But given that both rules apply on different kinds of structures (D-L applies on the basis of hierarchical structures and D-M applies on the basis of linear order) it becomes clear that they cannot compete. In Arregi & Nevins' (2008, 2012) terminology, they apply in different components within the postsyntactic module. D-L applies in what the call the *Exponence Conversion* component whereas D-M is part of the *Linear Operations* component. Thus, while it still may be the case that something like the *Obligatory Precedence Principle* applies within one component, it cannot be the case that it applies across components overall.

[23]The table in (65) is slightly simplified as it does not illustrate all possible candidates. Candidates with a non-initial root as well as a K-head immediately following the root are not shown for ease of exposition. These candidates do not play a role here as they can easily be excluded by high ranked constraints. Also, we have translated Ryan's somewhat unusual constraint system into one which makes use of more standard markedness constraints. Although there are cases in Ryan's paper where this difference is of importance, it does, as far as we can see, not make a substantial difference in the discussion here.

(65)　Evaluation of Mari morpheme order by bigram constraints à la Ryan (2010)

		*K-#	*K₂-D	*D-K₁	*#-D	*D-#	*K₁-D	*D-K₂	*#-K
	√-#-D-K₁			*!	*				*
☞	√-#-K₁-D				*		*		*
	√-D-#-K₁			*!		*			*
	√-D-K₁-#	*!		*		*			
	√-#-K₂-D		*!						*
☞	√-#-D-K₂				*			*	*
☞	√-D-#-K₂					*		*	*
	√-D-K₂-#	*!						*	

With K_1-cases (i.e. local cases), only one order of morphemes is acceptable whereas with K_2-cases, two orders are available due to the two constraints with equal ranking (i.e. #≻D and D≻#). Deriving the correct order of morphemes is not a problem in Ryan's account.

Crucially, however, as this table shows, the whole order is derived by parallel evaluation of all constraints at once. In other words, there is never an intermediate representation in between different operations. As was noticed by several people by now (see e.g. discussion in McCarthy 1999, 2007; Baković 2011), standard Optimality Theory cannot replicate stepwise derivations and therefore cases of opacity are inherently problematic.

The Duke-of-York derivation we have seen is a textbook example of opacity in this sense. The Mari facts have shown that an intermediate representation is needed to account for the application of SA. Without intermediate representations, we have no explanation why SA applies the way that it does. We think that this provides a strong argument in favor of a serial derivational account of postsyntax and against a parallel, representational account as the one by Ryan (2010).[24]
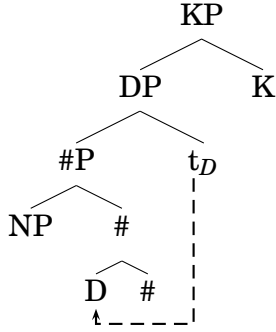
6.2 Alternative accounts

As mentioned in Section 4, the present analysis builds on and refines insights from Mc-Fadden (2004) where an account is provided for the nominal template of Eastern Mari, the neighboring dialect. McFadden (2004) assumes the same underlying syntactic structure and the existence of postsyntactic processes that manipulate these structures.
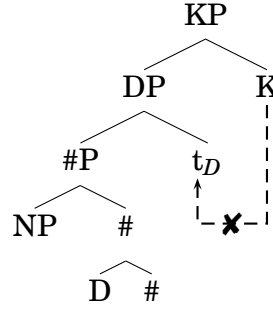
He assumes two lowering operations, the first of which is identical with what we call D-L. The second one imitates the effects of D-M but in terms of a postsyntactic lowering process that applies on hiearchical structure. His main argument for these two processes is that, in Eastern Mari, the application of the first lowering process can bleed the application of the second:

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[24]This does not necessarily mean that Ryan's account could not be modified in order to derive the data. There have been various attempts to reconcile Optimality Theory with instances of opacity such as enriched representations McCarthy (1999); van Oostendorp (2007) or serial optimization as in McCarthy (2000, 2007); Heck & Müller (2007). If Ryan's account would be reformulated in a serial OT account, it is not clear whether his account could be empirically distinguished from ours anymore.

(66) Lowering of D to #:

```
                KP
               /  \
             DP     K
            /  \    :
          #P    t_D :
         /  \    :  :
       NP    #   :  :
            / \  :  :
           D   # :  :
           ↑_ _ _ _ :
```

(67) Lowering of K_{local} to D:

```
                KP
               /  \
             DP     K
            /  \    :
          #P    t_D :
         /  \   ↑   :
       NP    #  :_ ✘ _:
            / \
           D   #
```

This analysis captures the observed facts in Eastern Mari, where the order [NP - D - # - K_{local}] is in fact the only one possible with local cases. However, it does not carry over to Meadow Mari without further ado. One reason is that in this dialect, the order [NP - # - K_{local} - D] is actually attested. In McFadden (2004), this is derived by saying that, in Meadow Mari, the first lowering process need not apply.[25] Since lowering of D did not apply, subsequent lowering of K_{local} can. The result is the [NP - # - K - D] surface structure. Crucially, it is never the case that both processes applied. However, the deletion pattern found with SA strongly suggest that there are derivations in which this must be the case. The Duke-of-York examples above cannot be derived without referring to the intermediate representation in between these two operations. We can therefore conclude that there are cases in which both operations must have applied. It is thus plausible to assume that the second operation is in fact a metathesis operation that may potentially non-local. A second argument against McFadden's implementation is the order of operations. We have seen that it must be the case that SA must apply in between the other two postsyntactic operations. However, if both of them are lowering operations, we have no principled reason why this should be the case. We would need an unmotivated stipulation that ensures the extrinsic ordering of operation. In our account, it is the architecture of the postsyntactic module that predicts the order of the operations in question. This order can thus be seen as intrinsic.

Before we return to properties of SA in Turkish, we want to briefly discuss a hypothetical account of SA in Mari that does not make use of ordered operations and underlying representations. We saw in Section 3.3 that the unexpected deletion patterns all involve a D-head. Under the analysis presented in Section 4, this is not surprising since all of the postsyntactic reordering processes we assumed circle around the position of the D-head.

However, if one does not want to subscribe to the assumption of underlying representations, one would have to come up with an alternative account to derive the deletion patterns. Given the observation above that it is always the D-head that creates problems for a simpler account, one might wonder whether it was possible to derive the deletion patterns by saying that D-heads do not count for the evaluation of the right edge in SA

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[25]He alludes to Kroch's (2000) 'Grammars in competition'-account and states that Western Hill Mari does not have lowering of D to #. In this account, Meadow Mari speakers have access to both the Hill Mari and the Eastern Mari grammars.

contexts. An example along those lines is given in (68).

(68)   Assumption:
        D-heads are invisible for the determination of the right edge of a conjunct.

A stipulation like (68) could derive the data pattern as far as we can see but, as far as we can see, misses the point. First, we have seen that D-heads can themselves be subject to SA. In cases where the possessive affixes in both conjuncts are identical, they are deleted in just the same way as case and number markers are. We see that in (69).

(69)   Nuno memnan pört   den sad-vlak-eške-na   tol-en-et.
        3PL   1PL.GEN house and garden-PL-ILL-1PL come-PAST-3PL
        'They came to our houses and our gardens.'

The first conjunct consists of nothing but the stem and since agreement of a head noun with a possessor is obligatory, we can be sure that the D-head has been deleted under SA too. It is quite implausible to assume that D-heads are visible for SA but invisible for the determination of the right edge in order to apply SA.

Second, it is unclear why D-heads should be invisible for SA in the first place. A possible answer to that question one might envisage could be that D is an affix whereas # and K are clitics. Given this assumption, one could state that clitics can undergo SA whereas affixes cannot. Good & Yu (2005) sketch an analyses along those lines for Turkish. Unlike in Turkish however, there is not the slightest argument for this dichotomy in Mari. One criterion to distinguish clitics and affixes in the world's languages is that clitics occur outside of affixes in linear order. This, however, is as we have seen not true in Mari. Another criterion is that affixes can trigger suppletion whereas clitics normally do not. As we have seen, we find suppletion sensitive to case whereas there is, to our knowledge, no suppletion for possessive morphemes. There is no reason to believe that postulating such a dichotomy is justified.

Third, recall that it is the adjacency of a conjunction that licenses SA (see example (9)). Only the conjunction *den* licenses SA. Hence, it is plausible to say that the context for SA is determined at the point when the conjunction is part of the structure. Then, however, all affixes and clitics must necessarily be part of the structure as well because they are part of each conjunct. Why D should be invisible for SA remains unclear. We believe that this shows convincingly that any account that wants to avoid underlying representations is forced to make unwanted stipulations about the nature of Suspended Affixation.

6.3 SA in Turkish and the relation to other deletion processes

In this section, we want to briefly come back to SA in Turkish and the question whether it should receive the same account as the one for proposed for Mari. We have seen throughout this paper that SA in Turkish and in Meadow Mari share a whole number of properties, most importantly the right-edge condition. Also, we saw that, in both languages, SA can only affect inflectional affixes but not derivational ones.

However, existing analysis of SA in Turkish do not conceive of SA in Turkish as a deletion process. The main reason is that, in Turkish, there are certain constraints on

the remnant of SA. More concretely, if we delete inflectional affixes in the first conjunct, the remnant of the first conjunct must end in what Kabak (2007) calls a terminal suffix. Without going too much into detail, we can state that aspect, modality and agreement suffixes are terminal suffixes, certain things such as tense are not. This is illustrated in the minimal pair in (70).[26]

(70)   a. *Calis-ti   ve basar-di-k.
          work-PAST and succeed-PAST-1SG
          'We worked and succeeded.'
       b. Calis-ir   ve basar-ir-iz.
          work-AOR and succeed-AOR-1SG
          'We work and succeed.'   Turkish: Kabak (2007)

The past tense affix in (70-a) does not count as a terminal suffix but the aorist morpheme does. At first sight it is not clear whether these facts can be reconciled with the deletion approach. In fact, parallel examples to the ones with the suppletive pronouns in Meadow Mari (see (14)) can be construed and in Turkish, they seem to be ungrammatical:

(71)   *Ilk once sen/san ve ban-a   bak-ti
        first   2SG   and 1SG-DAT look
        Intended meaning: 'S/he first looked at you and me.'   Turkish: Kabak (2007)

The second singular pronoun has the form /san/ when combined with the dative case marker, otherwise it is /sen/. According to Kabak (2007), both options are judged ungrammatical.

For these reasons, a deletion approach has, to our knowledge, not been pursued. Broadwell (2008) sketches an LFG-approach using lexical sharing, an operation that seems to share a number of properties with multidominance approaches couched in the Minimalist frameworks.[27] If we translated Broadwell's analysis to a multidominance approach, it would look like (72).[28]

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[26]It should be noted that the judgments of the examples in (70) and (71) are not shared amongst all Turkish speakers. Kadir Gökgöz (p.c.) finds these examples grammatical throughout. It could thus be, that there are some dialects of Turkish in which SA is better analyzed as a deletion operation after all.

[27]Broadwell states that a Minimalist accounts would massively overgenerate as they would have no possibility to exclude sharing of all kinds of affixes. However, his lexical sharing account makes reference to the notion of coinstantiators. Coinstantiators are lexically specified as affixes that allow for sharing. It is not to hard to imagine a solution along those lines in a Minimalist framework.

[28]The tree in (72) uses a structure proposed by Collins' (1988) where each conjunct is selected by its own coordination phrase. Even though this structure is rarely used, it makes some interesting predictions that are borne out for a number of Finno-Ugric languages. One of these is the persistent absence of binding effects between conjuncts (see Weisser (in prep.)). Also, since both conjuncts are syntactically represented as arguments (of &), most of the arguments for the standard &P-structure still apply (cf. Munn 1987; Zoerner 1995; Johannessen 1998; Weisser 2015).

(72)   A Multidominance Representation of SA in Turkish:

&P
&P   &'
KP   &   KP   &
DP   DP   K
#P   #P   D
NP   NP   #
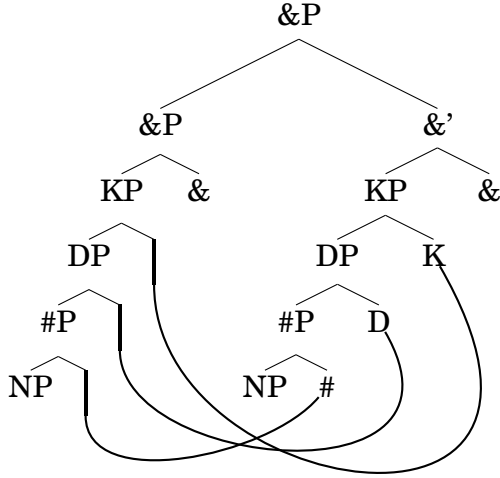
In Sections 2.1 and 2.3 we have seen two major arguments that a representation as in (72) is not tenable for Meadow Mari. First, we have seen the suppletion data is in (14) in Section 2.1 where the remnant of SA leaves behind nothing but a suppletive stem without actual case marking. Given that multidominance relations such as the ones above are resolved in the course of the linearization (as proposed by Wilder (1999); Citko (2005); Gracanin-Yuksek (2013)), then vocabulary insertion should not be sensitive to them. The second argument comes from examples with number marking that has undergone SA and distinct possessors as in (25) (repeated in (73)).

(73)   A-vlak tud-en   sad-še   den memn-an pasu-vlak-ešte-na mod-et.
       child-PL 3SG-GEN garden-3SG and 1PL-GEN field-PL-INESS-1PL play-3PL.PRES
       'The children are playing in his gardens and in our fields'

Number marking is generally assumed to be very close to the root (syntactically and semantically). An analysis along the lines of Broadwell (2008) would thus have to assume that a very small constituent (maybe only a bare NP) is conjoined in (73). However, since we see that each conjunct contains its own possessor, such a structure is not tenable. We can therefore conclude that Broadwell's analysis of SA in Turkish cannot be applied to Meadow Mari.

Broadwell's account leaves a number of questions open but if the structure above really turns out to be an adequate representation for SA in Turkish, we are facing a very interesting puzzle. Completely independently from the present discussion, recent analyses of Right Node Raising (RNR) have arrived at a point where it has been argued convincingly that neither an ellipsis account, nor a multidominance structure can fully derive all the observed facts. Larson (2012) as well as Barros & Vicente (2011) note that both analyses of RNR can, in their present form, derive a subset of the RNR data but not all of them. They thus conclude that both representations must be available to speakers under certain circumstances.

   Even though Larson and Barros & Vicente, of course, develop diagnostics to distinguish both types of RNR, they state that both phenomena share most of their properties. This

is exactly the situation we have arrived at with SA. Even though the diagnostics in both cases are, of course, very different, the conclusion is very similar. This strengthens the view that (i) SA is, in a certain sense, the word-internal counterpart of RNR and (ii) the dual analysis of RNR proposed in these works is indeed justified.

7 Conclusion

The goal of this article was twofold: First, we wanted to provide an argument for the fact that the complex nominal template of Meadow Mari, which features free order variation of certain morphemes as well as idiosyncratic ordering effects with others, should nevertheless be derived on the basis of an underlying uniform syntactic structure. As the actual underlying structure we take as a basis for our analysis is pretty much the standard syntactic hierarchy of functional projections, this can be seen as a strong argument in favor of the Mirror Principle. In order to achieve this goal, it was shown that an analysis according to which the actual surface order of morphemes is actually derived by means of postsyntactic reordering rules is empirically more adequate than a competing one that allows for free base-generation of certain orders. The argument for the former account was based on a deletion operation called Suspended Affixation. It was shown that the (non-)ability to delete certain morphemes under Suspended Affixation can be predicted under this analysis if the postsyntactic operations in question can be ordered in a derivational fashion.

The second goal of this article was to argue for exactly this derivational architecture of the postsyntactic module. The crucial idea behind the analysis was that Suspended Affixation applies at a point of the derivation when some, but not all, postsyntactic operations have applied. The resulting prediction is that there is an intermediate representation which accounts for the sets of affixes that can be deleted. This prediction is borne out. Which affixes are deletable and which ones are not can neither be predicted on the basis of the input structure nor on the output structure. A competing account that denies the existence of intermediate representations of this sort would thus have to make additional, completely unmotivated assumptions about the properties of Suspended Affixation to account for the data.

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