Postsyntactic Reordering in the Mari Nominal Domain
Evidence from Suspended Affixation

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Goals of this talk:

① The order of morphemes in the nominal domain in the eastern Uralic languages is unusual in several respects. It is argued that the actual surface order should nevertheless be derived on the basis of a syntactic structure that is consistent with the standard assumptions about DP syntax and Baker's (1985) Mirror Principle.

② It is argued that several operations change the orders of morphemes postsyntactically. The ordering of these operations will be crucial as these operations interact in various ways giving rise to opacity.

③ The analysis thus provides a strong argument for a derivational nature of the postsyntactic module as laid out in Arregi & Nevins (2012)

Evidence for these goals comes from *Suspended Affixation* in Meadow Mari, a process that is known to delete the right edge of nominal phrases in coordination. It can be shown that *Suspended Affixation* in Mari applies to an underlying representation rather than to the surface order of morphemes which allows us to pinpoint the order of morphemes at an intermediate point of the derivation.

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1 The nominal template of Meadow Mari

Nouns in Meadow Mari are inflected for number, case and the features of their possessors. The order of these morphemes in Meadow Mari differs significantly from those found in other language families. Most notably, it can be observed that there are two classes of case markers occurring in different slots.

(1) pasu-vlak-ešte-na
     garden-PL-INESS-1PL.POSS
     'in our gardens' (INESSIVE)

(2) pasu-vlak-na-m
     garden-PL-1PL.POSS-ACC
     'our gardens' (ACCUSATIVE)
                                              Meadow Mari[1]

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[1] All Meadow Mari data (unless otherwise stated) were collected with the help of Elina Guseva, a native speaker of Mari from Yoshkar-Ola (Mari El Republic - Russia).

However, this is not the only unusual thing we find in the nominal template of Meadow Mari. The plural marker /-vlak/ which usually occurs right next to the stem, can optionally follow the possessive affix:

(3)   pasu-vlak-na   (4)   pasu-na-vlak
      garden-PL-1PL.POSS   garden-1PL.POSS-PL
      'our gardens'   'our gardens'   Meadow Mari

Combining these different alternations, we end up with quite a number of possible nominal templates in Meadow Mari. The following table summarizes the possible orders of morphemes (see Alhoniemi (1993) and Luutonen (1997) for discussion).

(5)   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	$\# > K_{loc}$	'pasu-vlak-ešte'
(d)	PL > STRUCTURAL.CASE	$\# > K_{struc}$	'pasu-vlak-em
(e)	LOCAL.CASE > POSS	$K_{loc} > D$	'pasu-šte-na'
(f)	POSS > STRUCTURAL.CASE	$D > K_{struc}$	'pasu-na-m'
(g)	PL > LOCAL.CASE > POSS	$\# > K_{loc} > D$	'pasu-vlak-ešte-na'
(h)	POSS > PL > LOCAL.CASE	$D > \# > K_{loc}$	? 'pasu-na-vlak-ešte'
(i)	PL > POSS > STRUCTURAL.CASE	$\# > D > K_{struc}$	'pasu-vlak-na-m'
(j)	POSS > PL > STRUCTURAL.CASE	$D > \# > K_{struc}$	'pasu-na-vlak-em'

Despite the many possible affix orders in Meadow Mari, I argue that they are all derived from a uniform syntactic structure that is consistent with the standard assumptions about DP syntax and the Mirror Principle. Evidence for this assumption comes from a process called Suspended Affixation (SA).

2 Suspended Affixation

SA deletes affixes at the right edges of non-final conjuncts in coordination if they identical with the affixes of the final conjuncts.

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

SA is found many OV-languages in Asia in languages like Turkish (see e.g. Kornfilt 1996; Good & Yu 2005; Kabak 2007; Broadwell 2008, Japanese and Korean (see Yoon & Lee 2005), Armenian, Ossetic (Ershler 2012), Nivkh (Gruzdeva 1998), etc.

(7)   **The Right-Edge Condition on Suspended Affixation:**
      Inflectional affixes can only be deleted by Suspended Affixation if they form a coherent string at the right edge of a non-final conjunct.

The patterns of SA in Turkish below illustrate the Right-Edge condition nicely:

(8)   Acceptable Patterns of SA in Turkish:
    a) Stem   -PL   -POSS   ~~-CASE~~
    b) Stem   -PL   ~~-POSS~~   ~~-CASE~~
    c) Stem   ~~-PL~~   ~~-POSS~~   ~~-CASE~~

2.1 SA in Meadow Mari

Meadow Mari has two conjunctions /da/ and /den/. SA is found only with the conjunction /den/. The following minimal pair illustrates the pattern nicely:

(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-NOM and 3.SG-ACC see-3.SG.PRES
           'The man sees you and him'   Meadow Mari

In (9-a), with the conjunction /da/, no SA applies. We see that both conjuncts bear the accusative marker /em/. However, in (9-b), with the conjunction /den/, only the second conjunct bears the accusative. The first conjunct is unmarked, which is, in this case, identical to the nominative.
The process is not specific to case. Number marking can be deleted as well:

(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.'

(10) also illustrates that, with more than two conjuncts, all non-final conjuncts undergo deletion.
Deletion of case markers in coordination with the conjunction /den/ is more or less obligatory (11), number marking can be retained (see (12)) if the ambiguity that arises is problematic. Usually, number is deleted as well.

(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 birds.'

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

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.

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

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   užeš
            Man.NOM us.ACC   and them.ACC sees.3.SG
      b.   Pörjeng   memna den nunem   užeš
            Man.NOM us.???   and them.ACC sees.3.SG
            'The man sees us and them.'   PRON.NOM.1PL = me

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/. 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).

So far, examples of SA only contained case and number affixes. If examples contain a possessive affix in addition, things become more complicated.

(15)   Nuno memnan pört   den sad-vlak-eške-na   tolenet.
         3PL   1PL.GEN house and garden-PL-ILL-1PL came.
         'They came to our houses and our gardens.'

When deleting only a subset of the affixes, the right edge condition can be violated:

(16)   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.'

(17)   uš-   ~~ešte~~ -m
         mind- INESS -1SG

Local case markers can be deleted even though the possessive agreement morpheme is located on the right edge of the phrase.

(18)   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'

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

The following table lists all possible combinations and the respective deletion patterns:

(20)   Patterns of deletion with local case:

	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~~	✔

(21)   Patterns of deletion with structural 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~~	✔

⇒ In Meadow Mari, unlike in Turkish, non-final elements can be deleted even though final ones are retained. The plural marker /-vlak/ and also local case markers can be deleted even though they are followed by the possessive affix.

↪ This raises the question whether SA can receive a unified analysis in Mari and other languages.

3 The Analysis

In the following, I will propose an analysis that allows for a unified analysis of Suspended Affixation in Mari and Turkish *and* allows to maintain the standard assumptions about DP syntax and the Mirror Principle. The concrete assumptions I make are the following:

- The highest syntactic category heading noun phrases is KP (see Travis & Lamontagne (1992); Bittner & Hale (1996); Bayer et al. (2001)). The underlying structure for KPs is thus the following (see e.g. Alexiadou & Wilder (1998),Harley & Ritter (2002),McFadden (2004))

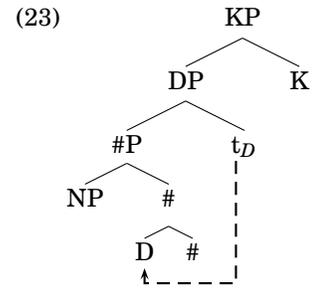(22) $[_{KP} [_{DP} [_{\#P} \text{ NP \# }] \text{ D }] \text{ K }]$

Num hosts the plural affix /-vlak/, D hosts the possessive affixes, and K hosts the various case markers.

- There are various idiosyncratic postsyntactic processes at work in Meadow Mari. These include:

(23)

① Lowering of D (D-L) (see McFadden 2004):

A postsyntactic process that lowers D to left-adjoin to # (as in (27)). Applies on the basis of hierarchical structure (i.e. prior to linearization) (cf. Embick & Noyer (2001),McFadden (2004)). The process is optional and thus derives the alternation between (24) and (25).

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

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

② Suspended Affixation (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 (26)). Applies to linearized structures.

(26)   [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}

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.

(27)   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.

The effects of (27) are the following:

(28)   NP D K$_{loc}$ $\Rightarrow$
        NP ⟦ D ⟩⟨ K$_{loc}$ ⟧ $\Rightarrow$
        NP – D K$_{loc}$ – D K$_{loc}$ $\Rightarrow$
        NP K$_{loc}$ D

(29)   NP D # K$_{loc}$ $\Rightarrow$
        NP ⟦ D ⟩⟨ # K$_{loc}$ ⟧ $\Rightarrow$
        NP - D # K$_{loc}$ - D # K$_{loc}$ $\Rightarrow$
        NP # K$_{loc}$ D

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By reordering the local cases and the possessive affix, D-M derives the alternation between (30) and (31):

(30) pasu-vlak-ešte-na   (31) pasu-vlak-na-m
      garden-PL-INESS-1PL.POSS   garden-PL-1PL.POSS-ACC
      'in our gardens' (INESSIVE)   'our garden (ACCUSATIVE)'

These language-specific processes are now are now ordered in the following way (including the two operations Linearization (LIN) and Vocabulary Insertion (VI)):

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

Given this order of operations, it is possible to derive (a) the possible and impossible morpheme orders of Meadow Mari and (b) the (in)ability to delete under SA.

4 The Derivations

4.1 Deriving the order of morphemes

To derive the whole pattern of possible orders of morphemes in the nominal template of Meadow Mari, we must consider the effects of two postsyntactic processes: D-L and D-M.

The syntactic structure that serves as the basis for all the possible postsyntactic operations that we have to consider is the following:

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

Based on this structure, we can derive the orders in question by applying D-L and D-M. We start with simple examples with only two morphemes:

(34) Number and Possessive:

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

Since D-L is optional, it generates both orders (NP D # and NP # D). D-M does not apply since its description is not met (there is no local case feature).

(35) Possessive and Case:

	Input	D-L	Intermediate	D-M	Output
a)	NP - D - K_{loc}	✗	NP - D - K_{loc}	✔	NP - K_{loc} - D
b)	NP - D - K_{struc}	✗	NP - D - K_{struc}	✗	NP - D - K_{struc}

Since there is no overt #, D-L has no effects. In (35-a), D-M applies changing the order of D and K_{loc}. In (35-b), D-M does not apply since its description is not met (there is no K_{loc}).

(36)   Number and Case:

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

Neither D-L nor D-M change the order of morphemes since there is no overt D. Hence, the only possible order is # - K

Now we turn to cases with three morphemes involved in the order changes. In (37), an intermediate representation is given that shows the order of morphemes at the point of the derivation after D-L and before D-M.

(37)   Number, Possessive and Local Case:

	Input	D-L	Intermediate	D-M	Output
a)	NP - # - D - K_{loc}	✗	NP - # - D - K_{loc}	✔	NP - # - K_{loc} - D
b)		✔	NP - D - # - K_{loc}	✔	NP - # - K_{loc} - D

In (37-a) and (37-b), the input involves a K_{loc} case marker. Here, we see that regardless of whether the optional D-L applies, D-M will overwrite all of its effects and the order with K_{loc}-type case markers is invariant.[2]

(38)   Number, Possessive and Structural Case:

	Input	D-L	Intermediate	D-M	Output
a)	NP - # - D - K_{struc}	✗	NP - # - D - K_{struc}	✗	NP - # - D - K_{struc}
b)		✔	NP - D - # - K_{struc}	✗	NP - D - # - K_{struc}

In (38), we see that D-M never applies as its description is not met (there is no K_{loc}). Thus, D-M cannot overwrite the effects of D-L and the result is optionality in morpheme orders when a K_{struc}-marker is involved.

4.2 Deriving the (in)ability to delete under SA

Given the order of operations in (32), SA applies precisely at the intermediate representation between D-L and D-M. We can show that the order of morphemes at the intermediate stage is of importance if we look at examples where only a subset of the affixes is deleted.

Number and Possessive:
Two possible intermediate representations: N - D - #
                                                                              N - # - D

(39)   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 #.

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[2]As was noted above, some speakers allow the order NP - D - # - K_{loc}. This order can be derived under the assumption that these speakers have a slightly different definition of D-M, namely one in which D-M only applies when D and K_{loc} are adjacent. In this case, D-M would not apply in (37)-b) and the correct order would be derived.

Case and Possessive:

One intermediate representation: N - D - K

(40) 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

Number and Case:

One intermediate representations: N - # - K

(41) 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 #

Number, Possessive and Local Case:

Two possible intermediate representations: NP - # - D - K
                                                                    NP - D - # - K

(42) 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

(43) 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 #

Number, Possessive and Structural Case:

Two possible intermediate representations: NP - # - D - K
                                                                    NP - D - # - K

(44) 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

(45) 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 #

> **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. The order must be exactly as in (46).
>
> (46)   Order of Operations:
> $\boxed{\text{D-L}} > \boxed{\text{LIN}} > \boxed{\text{SA}} > \boxed{\text{D-M}} > \boxed{\text{VI}}$
>
> A representational account such as Ryan (2010), cannot account for the deletion facts in any similarly straightforward way as there is no intermediate representation that SA could refer to.
> The present analysis relies on the assumption of a stepwise application of postsyntactic operations and thus strongly supports derivational nature of the postsyntactic module as laid out in Arregi & Nevins (2008, 2012)

5 Conclusion

In this talk, I sketched an analysis that derives the morphological template of the noun phrase of Meadow Mari. The main assumptions of the analysis were:

- The underlying syntactic structure corresponds to the standard assumptions about DP syntax and the application of Baker's Mirror Principle.

- The specific morpheme orders of the Mari template were derived by two postsyntactic rules applying in a specific order.

- The Suspended Affixation operation applies at a certain point in the derivation at which it is fed by some of the operations but counterfed by others giving rise to opacity.

Under these assumptions, the analysis was able to capture...

- ... the variation of the morphological template in Meadow Mari which allowed for several of the possible affix orders while systematically excluding others.

- ... the complex but still systematic nature of the Suspended Affixation operation which, unlike in Turkish, does not always affect morphemes located at the right edge of surface orders.

In doing so, this analysis provides strong arguments for...

- ... the importance of Baker's (1985) Mirror Principle as a core principle of the syntax-morphology interface.

- ... the need for intermediate representations and thus a derivational account to post-syntax as laid out by Arregi & Nevins (2012).

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Appendix: Allomorphy and Suppletion

Further evidence for the order of operations in (32) comes from allormorphy and suppletion. One of the rare cases of allomorphy in Meadow Mari is found with the illative case marker.

(47) oms-aške / oms-aš   (48) oms-aške-m / *?oms-aš-em
      door-ILL   door-ILL-1SG
      'to a door'   '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.
In more technical terms, the vocabulary insertion into K is sensitive to whether D-M has applied or not. This is expected since D-M > VI. We can thus formulate the insertion rules for the illative marker as follows:

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

(50)   ILLATIVE   →   -eške *or* -eš

An interesting case of suppletion is found with the plural pronouns in Meadow Mari which undergo stem suppletion in the genitive, the accusative and (for most speakers) the dative.

(51)   Pronominal Paradigm of 1PL and 2PL in Meadow Mari

	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-ye	te-ye

Alhoniemi (1993:79)

In (52) we see that if a 1st person pronoun is the first conjunct of a conjoined direct object (bearing the accusative), SA leaves just the suppletive stem as a remnant.

(52)   a.   Pörjeng   memna den nunem   užeš
              Man.NOM us.???   and them.ACC sees.3.SG
              'The man sees us and them.'

This shows that *vi* is sensitive to features that have been deleted under SA. This is unexpected under the current implementation since SA precedes VI.

In order to solve this dilemma, we refine the definition of SA saying that it rather marks certain heads for zero-insertion rather than actually deleting the features on these heads.

(53)   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 (54)). Applies to linearized structures.

(54)   [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}

This solves the problem inasmuch as it does not actually delete the features on the non-final conjuncts. Rather, it marks the heads in question for non-insertion (see Murphy (2015) for a similar implementation of deletion under Gapping).