Two Paths to Polysynthesis: The View from West Circassian Nominalizations

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Abstract

West Circassian displays prominent polysynthetic morphology both in the verbal and nominal domains and both syntactic categories are subject to the same morphological ordering constraints. I argue that despite these similarities, nominal and verbal wordforms in West Circassian are in fact constructed via two distinct word formation processes: while the verbal root and any accompanying functional morphology are pronounced as a single phonological word by virtue of forming a single complex syntactic head via head movement, the nominal head and its modifiers are pronounced as a single word due to rules of syntax-to-prosody mapping. Such a division of labor provides an account for why only nouns, and not verbs, exhibit productive noun incorporation in the language: West Circassian noun incorporation is prosodic, rather than syntactic. The evidence for the existence of these two avenues of word formation comes from a systematic violation of morpheme ordering observed in verbal nominalizations. In terms of broader theoretical impact, the proposed analysis provides insight into what factors shape a polysynthetic language: while it is tempting to reduce polysynthetic morphology to either simple head movement or just a consequence of mapping complex syntactic structure to a single phonological word without any head movement, the West Circassian data show that neither of these mechanisms can be dispensed of.

1 Introduction

The focus of this paper is the morphology-syntax interface in West Circassian (also known as Adyghe). West Circassian belongs to the Northwest Caucasian family and is commonly characterized as polysynthetic, with prevalent head marking and templatic agglutinative morphology (Arkadiev et al. 2009, Kumakhov and Vamling 2009, among others). The morphological profiles of verbs and nouns – often called nominal and verbal complexes – are organized in accordance with the same morphological template. There is, however, an important difference between word formation in the nominal and verbal domains: while nominals productively form complex stems with incorporated nominal and adjectival modifiers, as can be seen in (1), verbs do not exhibit productive noun incorporation (2) – the theme must instead be spelled out as a separate morphophonological unit (3).[1]

(1)　adəγa- bze　　-m　Ø-　　jə-　[txe　-n]-　xebze- g^wəš'əʔa -λ
　　　Adyghe- language -OBL　3SG.PR- POSS- [write -NML]- rule-　word　　-PLACE
　　　'the orthographic (lit. writing rule) dictionary (lit. place for words) of the Adyghe language' (WCC)

(2)　* sə/s-　　　**leʁe**- thač'ə -ʁ
　　　1SG.ABS/ERG- **dish**- wash　-PST
　　　Expected: 'I washed dishes'

(3)　**laʁe-xe-r**　　Ø-s-thač'ə-ʁe
　　　dish-PL-ABS 3ABS-1SG.ERG-wash-PST
　　　'I washed dishes.' (Tg)

The central claim of this paper is that this difference is due to the fact that nominal and verbal complexes are constructed via distinct structural avenues. In particular, while the nominal complex is pronounced

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[1]The examples are glossed in accordance with the Leipzig conventions, with the following additions: DIR – directive; DYN – present tense on dynamic verbs; HBL – habilitive; MOD – modal future; PR – possessor; RE – refactive; SML – simulative.

as a single morphological word due to rules of syntactic phrase to word mapping, the verbal complex is constructed via head movement.

Evidence for these two paths to word formation comes from the morphology of deverbal nominalizations. Nominalized predicates, like non-derived nominals, may form a complex stem with incorporated nominal and adjectival dependents, however, unlike nominals that are not derived from verbal stems, e.g. $g^w\partial\check{s}'\partial\Omega a\lambda$ 'dictionary' in (1), the incorporated lexical material does not appear adjacent to the verbal root, but rather precedes any verbal functional morphology that is present in the nominalized form (4).

(4)   a.   Prefixes$_{\text{nominal}}$- $\boxed{\text{Incoporee-}}$ **Prefixes$_{\text{verbal}}$**- $\boxed{\text{Root}}$ -Nominalizer

       b.   Ø-   jə- $\boxed{\text{keše-}}$ **ʁe-** $\boxed{\hat{z}^w a}$ -č̣'e

           3SG.PR- POSS- porridge- CAUS- boil   -NML

           'his/her porridge-cooking' (Tg)

I propose an analysis of noun incorporation in nominalized constructions along the lines of Massam (2001) and Barrie and Mathieu (2016): the incorporated nominal has a diminished structure – NP – which may not be assigned case. In the lack of case licensing, the corresponding NP remains in situ in its base generated position. The nominalized noun phrase, including the embedded NP, is pronounced as a single word due to a rule of prosodic phase-to-word mapping, as proposed by Compton and Pittman (2010): the DP phase is spelled out as a single word. The verbal root, on the other hand, undergoes head movement to form a single complex head with any verbal functional projections that are included in the nominalization, thus ensuring that verbal functional morphology appears closer to the verbal root than the incorporated argument.

In light of the analysis proposed here, it is clear that polysynthetic morphology cannot be uniformly derived via head movement, as proposed by Baker (1988, 1996), nor can it be treated as a simple consequence of language-specific rules of syntax-to-prosody mapping, as argued for by Compton and Pittman (2010); Barrie and Mathieu (2016): in West Circassian, both mechanisms of word formation are necessary in order to account for the observed morphological forms.

The remainder of the paper is organized as follows. Section 2 provides the basic background on West Circassian grammar, with a particular focus on the morphosyntactic structure of the verbal and nominal phrases. Section 3 presents the core proposal – the two strategies of word formation in West Circassian. Section 4 presents the evidence for the proposed analysis with a detailed description of the morphosyntax of deverbal nominalizations. To conclude, section 5 recaps the analysis and discusses further implications.

2   Background on West Circassian

This section presents a brief overview of West Circassian morphology and general clause structure. Subsection 2.1 discusses the general properties and similarities and differences between morphological profiles of nominal and verbal wordforms. Subsection 2.2 presents the two primary diagnostics for determining word boundaries in West Circassian. Subsection 2.3 contains a short description of the general structure of the West Circassian sentence.

2.1   Verbal and nominal morphology

West Circassian has generally been labeled as polysynthetic, with complex morphological words and prevalent head marking. For example, the predicate in (5) includes prefixes cross-referencing four participants, from left to right: an absolutive theme, a benefactive applied object, a dative applied object denoting the causee of a transitive base verb, and an ergative agent denoting the causer that is introduced by the causative morpheme ʁe-. The markers referring to the applied objects appear alongside applicative prefixes marking the semantic role of the corresponding applied object. Finally, the root is followed by a past tense suffix.

(5) sə-   qə- p-   f-   a-   r-   jə-   ʁe-   λeʁʷə -ʁ
    1SG.ABS- DIR- 2SG.IO- BEN- 3PL.IO- DAT- 3SG.ERG- CAUS- see   -PST

   'He showed me to them for your sake.' (Korotkova and Lander, 2010, 301)

The morphemes in a West Circassian word follow a particular order and are organized into zones as shown in Table 1.[2] The argument structure zone (A) includes any personal cross-reference markers and corresponding applicative prefixes marking the particular semantic role of the applied object (e.g. benefactive *fe-*, comitative *de-*, locative *š'ə-*, etc.), as well as the directive prefix *qə-* which, apart from some lexicalized uses, expresses directionality towards the speaker or inversion in accordance with the personal hierarchy 1 > 2 > 3 (Arkadiev et al., 2009, 43). The pre-stem zone (B) includes the dynamic prefix *e-/me-* which marks present tense on dynamic predicates[3], the optative prefix *were-* and prefixal negation *mə-*. Of these markers, only negation may be used in non-finite forms such as non-predicative nominals and deverbal nominalizations. Zone (C) contains solely the causative morpheme *ʁe-*, of which there could potentially be more than one instance (for discussion of such forms see Lander and Letuchiy 2010). The stem (D) contains the lexical root and any incorporated lexical stems, followed by suffixes expressing an array of temporal, aspectual and modal information. Finally, endings (E) include the plural suffix and a variety of subordinating morphemes such as case. The last zone is set apart from the rest of the template in that it does not participate in a productive edge-sensitive vowel alternation, which will be outlined in more detail below.

Table 1: Morphological template (adapted from Lander 2017, 79)

Argument structure zone	Pre-stem zone	Causative marker(s)	Stem		Endings
(A)	(B)	(C)	(D)		(E)
Verbs: ABS, ERG, IO Nouns: POSS	NEG, DYN, jussive	CAUS	incorporated stems + root	TAM-related suffixes	number, case, etc.

Nominal forms are built in accordance with the same template: personal markers in zone (A) may include a personal prefix cross-referencing the possessor; in cases of alienable possession this prefix is followed by the possessive marker *jə-*.[4] The pre-stem zone (B) may contain the negative prefix *mə-*. Since zone (C) is occupied solely by causative morphology, it does not generally occur in nominal constructions. The stem (D) may contain the lexical root denoting the semantic head of the construction, adjectival and nominal modifiers, as well as derivational suffixes such as -*λ(e)* in (1). Endings in zone (E) include the plural suffix -*xe*, case morphology and markers of coordination. For example, the nominal complex in (6) includes an incorporated nominal root *ʁʷəneʁʷə* 'neighbor', a personal marker referring to the possessor, which, in this case, is followed by the prefix *jə-* marking alienable possession, as well as suffixes marking plural number, absolutive case, and the additive coordinator -*jə*.

(6) [t-   jə-]A [ʁʷəneʁʷə- č'ale]D [-xe -r   -jə]E
    1SG.PR- POSS- neighbor- boy   -PL -ABS -ADD

   'and our neighbor boys' (Tg)

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[2]For a recent description of the templatic nature of West Circassian morphology and possible violations in the nominal domain see Lander (2017); for a general overview of the West Circassian morphology see Arkadiev et al. (2009).

[3]The latter form only appears if there are no overt prefixes preceding it; the former allomorph appears everywhere else (Arkadiev et al., 2009, 45-46).

[4]See Gorbunova (2009) on alienable vs. inalienable possession in West Circassian.

Since both nominal and verbal forms are organized in accordance with the same morphological template, it may be tempting to posit a single mechanism of word formation for both syntactic categories. However, the two categories exhibit an important difference: only a nominal complex may incorporate adjectival or nominal modifiers; this type of compounding is compositional and productive (Lander, 2017). Verbs, on the other hand, do not exhibit productive noun incorporation of their arguments (Lander, 2016, 3512). In the following section I argue that this difference is a consequence of the way wordhood is established in the language: the nominal extended projection is mapped directly to a prosodic word via rules of syntax-to-prosody mapping, while the verb is constructed via head movement. Noun and adjective incorporation in the nominal complex is then a phonological consequence of that noun or adjective appearing within a projection that is mapped to a single prosodic word. The verb, on the other hand, does not display this type of incorporation because it is derived via head movement rather than simple constituent-to-word mapping.

2.2 Wordhood diagnostics

This section provides an overview of morphosyntactic and morphophonological wordhood diagnostics in West Circassian, with a particular focus on compounding or incorporation of multiple lexical roots. There are not many applicable diagnostics for establishing wordhood in the language. While there are a few word-internal phonological processes (Arkadiev and Testelets, 2009), only one of them (described below) has a general enough environment to be applicable in cases of noun or adjective incorporation. Other phonological criteria such as the distribution of lexical stress, are not systematic or phonetically salient enough to be used as a reliable wordhood diagnostic (Arkadiev et al., 2009, 23-24). The two main diagnostics outlined in this section are taken from Lander (2012a) and Lander (2017, 84-86) and are the following: (i) positioning within the morphological template presented in Table 1 and (ii) participation in a stem-final dissimilative vowel alternation.[5]

The first diagnostic concerns the ordering of morphological material; in particular, as can be seen in Table 1, incorporated lexical roots appear within the stem zone (D), to the right of any prefixes such as negation or possessive morphology and to the left of any endings such as the plural suffix or case markers. Thus, we can see that the incorporated nominal *xebze* in (7) appears to the right of the possessive prefix *ja-*. Conversely, if an adjective is incorporated to the right of the semantic head, it appears to the left of any suffixes, such as the plural marker *-xe* (8).

(7) ja-　　　　　 **[xebze-** bzəpχe**]D**
　　　 3PL.PR+POSS- **rule-** example
　　　 'their legal example' (WCC)

(8) t-　　　 jə-　　 **[** [še-　 n]-　 xebze- **daxe]D** -xe -r
　　　 1PL.PR- POSS- [lead- NML]- rule- beautiful -PL -ABS
　　　 'our lovely rules of conduct (lit. leading rules)' (WCC)

Incorporated lexical stems are contrasted with non-incorporated elements, such as relative clauses, which appear outside the morphological template, to the left of any prefixes (9).

(9) hač̣'e-xe-m　　 [Ø-qə-d-ble-č̣'ə-š'tə-ʁe-xe]RC　　　 **ja**-mašjəne-xe-r
　　　 guest-PL-OBL 3ABS-DIR-1PL.IO-LOC-leave-IPF-PST-PL **3PL.PR+POSS**-car-PL-ABS
　　　 'the guests' cars which were passing by us' (Arkadiev et al., 2009, 69)

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[5]See Lander (2012a) for additional syntactic and semantic evidence for the lexical modifiers forming a single word with the head root in a nominal complex.

The second diagnostic concerns a productive dissimilative vowel alternation (subsequently called the /e/∼/a/ alternation); below is its definition as presented by Lander (2017, 80) (see also Smeets 1984, 206-211 and Arkadiev and Testelets 2009, 122-131):

(10)   The /e/∼/a/ alternation:
        If the two final syllables immediately preceding the right border of the stem both contain the vowel /e/ in its underlying form, the penultimate vowel is changed into /a/. (Lander, 2017, 80)[6]

For example, if the nominal root *xebze* 'rule' appears as the rightmost element within the stem, as in (11), the vowel /e/ in the penultimate syllable of the root (which in this case corresponds to the penultimate syllable of the stem) undergoes the alternation, resulting in the surface form *xabze*.

(11)   Ø-   jə-   [qeraləʁʷe-   **xabze**]_D
        3SG.PR- POSS-   government- rule
        'its governmental law' (WCC)

In (12) this same root is followed by the monosyllabic adjective *č̣'e*, which forms a part of the stem, and the penultimate syllable of this root no longer corresponds to the penultimate syllable of the stem and thus the vowel in this syllable does not undergo the /e/∼/a/ alternation. Instead, the vowel /e/ in the final syllable of the root undergoes this alternation, thus resulting in the surface form *xebza*.

(12)   [**xebza**- č̣'e]_D
          rule-   new
        'new rule' (WCC)

Compare this with the form of this same root in (7)-(8) and (1), repeated below in (13). in (7) and (13) the root *xebze* is incorporated into the nominal heads *bzəpχe* 'example' and *gʷəš'əʔaλ* 'dictionary' respectively, and thus does not appear at the left edge of the stem; similarly, in (8) this same root appears before the incorporated adjective *daxe* 'beautiful'. In all three cases, neither of vowels in this root undergo the /e/ ∼/a/ alternation because they do not appear in the relevant morphophonological context. Note that in all three cases the morphological position of the root *xebze* 'rule' – after the possessive prefix in (7) and between two lexical roots in (8) and (13) – also provides evidence for this root being incorporated into the larger nominal complex.

(13)   adəɣa-   bze   -m   Ø-   jə-   [txe -n]-   xebze- gʷəš'əʔa -λ
        Adyghe- language -OBL   3SG.PR- POSS- [write -NML]- rule-   word   -PLACE
        'the orthographic (lit. writing rule) dictionary (lit. place for words) of the Adyghe language' (WCC)

In Section 4 on nominalizations the two diagnostics presented here will play a crucial role in determining whether an argument is incorporated into the nominalized verbal form.

2.3   General clause structure

West Circassian displays ergative alignment in both cross-reference marking patterns and case assignment. Whithin the verbal form, cross-reference markers surface in a fixed order, and the personal marker referring to the absolute argument (i.e. the theme of a transitive verb and the sole argument of an intransitive verb) occupies a position distinct from other verbal arguments. This can be seen most clearly in the presence of

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[6]A number of morphemes, e.g. the dynamic prefix *e-* and the optative prefix *ere-*, do not participate in the alternation and block its occurrence on the preceding syllable, despite forming the proper phonological environment; see Arkadiev and Testelets (2009, 127-129) for discussion of such cases.

the directive prefix *qə-/qe-*, which in these examples is used to mark the directedness of the action. This prefix surfaces to the immediate right of the absolutive personal marker and to the left of the ergative and indirect object markers. Thus, the first person cross-reference markers referring to the ergative agent (14a) or applicative indirect object (14b) surface to the right of the directive prefix, while the first person marker referring to the theme of the transitive verb (14c) or the subject of an intransitive verb (14d) appears to the left of the directive prefix.

(14) a. Ø-   qə- [Ø-   fe-] s-   š'a -ʁ
          3SG.ABS- DIR- 3SG.IO- BEN- **1SG.ERG**- bring -PST

      '**I (transitive subject)** brought him/her to him/her'

   b. Ø-   qə- [s-   f-] jə-   š'a -ʁ
       3SG.ABS- DIR- **1SG.IO**- BEN- 3SG.ERG- bring -PST

      'S/he brought him/her **to me (indirect object)**'

   c. **sə**-   q- jə-   š'a -ʁ
       1SG.ABS- DIR- 3SG.ERG- bring -PST

      'S/he brought **me (direct object)**'

   d. **sə**-   qe- k̰ʷa -ʁ
       1SG.ABS- DIR- go   -PST

      '**I (intransitive subject)** came here' (Rogava and Keraševa, 1966, 137-138)

In terms of case marking, the theme of a transitive verb and the single argument of an intransitive verb are marked with the absolutive suffix *-r*, while the ergative agent, as well as any applied objects receive the oblique marker *-m*. Thus, the subject of the intransitive verb *qeŝe* 'dance' (15a) and the theme of the transitive verb *ẑe* 'plow' (15b) are both assigned absolutive case *-r*, while the ergative agent of the latter verb carries the oblique case marker *-m*. Additionally, any indirect objects are assigned oblique case as well, such as the comitative applied object *ŝʷəzə* 'woman' in (15c). The oblique case suffix *-m* is also used to mark possessors (16a) and complements of postpositions (16b).

(15) a. č̣'ale-**r** Ø-q-e-ŝe
          boy-**ABS** 3ABS-DIR-DYN-dance

         'The boy is dancing.'

   b. ẑʷak̰ʷe-**m**   qʷəbʁʷe-**r** Ø-ə-ẑʷa-ʁ
       plowman-**OBL** field-**ABS**   3ABS-3SG.ERG-plow-PST

      'The plowman plowed the field.'

   c. ƛ̣ə-r   ŝʷəzə-**m**   Ø-[Ø-d]-eʔepəʔe
       man-ABS woman-OBL 3SG.ABS-[3SG.IO-COM]-help.DYN

      'The husband is helping the wife.' (Arkadiev et al., 2009, 53)

(16) a. pŝaŝe-**m** Ø-jə-pŝeŝeʁʷ
          girl-**OBL** 3SG.PR-POSS-female.friend

         'the girl's friend'

   b. mə ŝʷəzə-**m**   paje
       this woman-**OBL** for
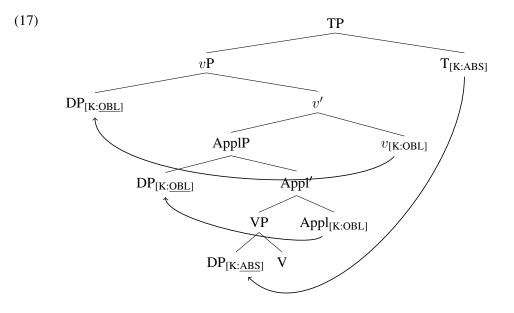
      'for this woman' (Tg)

Caponigro and Polinsky (2011) differentiate between the use of the oblique case marker *-m* on ergative DPs and its other uses; Rogava and Keraševa (1966); Arkadiev et al. (2009); Lander (2012b) provide a

uniform treatment for all instances of this marker. In this paper I follow recent work on West Circassian in glossing both case markers as oblique, but follow Caponigro and Polinsky (2011) in assuming that the source of the case differs for the various types of arguments. In cases of potential ambiguity, the examples are labeled accordingly.

Nouns may appear without overt case marking; the lack of case marking is generally associated with indefiniteness. Additionally, possessed nominals, proper names and personal pronouns generally do not inflect for case (Arkadiev et al., 2009, 51-52). While the order of arguments in a full clause is free, the language is prevalently left-branching: case markers are suffixal; the language has postpositions rather than prepositions; embedded clauses tend to be verb-final, and relative clauses appear to the left of their nominal external head.

West Circassian has been argued to display certain properties of a syntactically ergative language (Lander, 2009; Letuchiy, 2010), but the ergative DP passes a number of traditional subjecthood diagnostics, such as the ability to bind reflexives and denote the addressee of an imperative (Caponigro and Polinsky, 2011; Potsdam and Polinsky, 2012). These diagnostics provide good reason to believe that the ergative DP c-commands the absolutive DP at least at a certain stage of the derivation.

In this paper I will assume Caponigro and Polinsky's (2011) analysis of case assignment in West Circassian, with a slight adjustment. Following their analysis, the ergative subject and applicative indirect objects are assigned inherent case by v^0 and $Appl^0$ respectively, but the absolutive DP is uniformly assigned absolutive case by T^0, as opposed to it being the instantiation of two separate cases: nominative on subjects and accusative on direct objects. This analysis is illustrated in (17).

(17)

A single locus for absolutive case assignment is motivated by the fact that, unlike the ABS=DEF languages analyzed by Legate (2008), West Circassian does not show the structural dichotomy between the two cases in any configurations: absolutive case on subjects is available in all the same contexts as absolutive on direct objects. However, nothing in the core proposal of this paper hinges on this decision: the analysis proposed here is equally compatible with either treatment of case assignment.

3 Mechanisms of polysynthetic word formation

This section outlines the core theoretical proposal of the paper. The claim is that words in West Circassian are derived via two distinct avenues based on whether they are contained within the extended projection of a nominal, or a verb. Verbal forms are constructed via head movement, while a nominal phrase is pronounced as a single word due to rules of phase-to-word mapping: a DP is spelled out as a single phonological word.
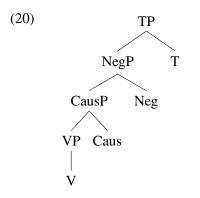
3.1 Head Movement

In this subsection I present an analysis of word formation in the verbal domain, in particular, I propose that the functional heads of the verbal extended projection are concatenated with the lexical verb via head movement to the highest head within the verbal extended projection, i.e. T^0 or C^0.

As can be seen in Table 1, the prefixes in zones B-C (i.e. excluding the argument structure zone) surface in accordance with their semantic and syntactic scope. In particular, negation and the present tense prefix that surfaces on dynamic verbs appear farther from the verbal root than the causative marker: an example of negation preceding the causative prefix is presented in (18) and the dynamic present tense prefix preceding this same causative morpheme can be seen in (19).[7]

(18)   zə-   Ø-   š'-   jə-   **mə-**   **ʁe-**   ʁʷəpš'   -ew
       REFL.ABS- 3SG.IO- LOC- 3SG.ERG- **NEG-** **CAUS-** forget   -ADV
       'not to let oneself forget' (Tg)

(19)   Ø-   Ø-   je-   s-   **e-**   **ʁa-**   ž'e
       3ABS- 3SG.IO- DAT- 1SG.ERG- **DYN-** **CAUS-** begin
       'I am beginning it' (Tg)

The relative order of the present tense marker and negation cannot be determined, because they do not co-occur: the present tense prefix only occurs in non-negated dynamic matrix verbs. I will assume, however, that prefixal negation appears below T^0, because it is preserved in nominalizations (see section 4.2). The low syntactic position of prefixal negation correlates with it having narrow semantic scope; it contrasts with suffixal negation, which surfaces on the right edge of the verbal form and takes scope over the full assertion (Lander and Sumbatova, 2007). Based on these considerations and the order of prefixes in (18) and (19), I adapt the functional hierarchy for the verbal projection illustrated in (20).

(20)

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                    TP
                   /  \
               NegP    T
              /   \
          CausP    Neg
          /   \
        VP    Caus
        |
        V
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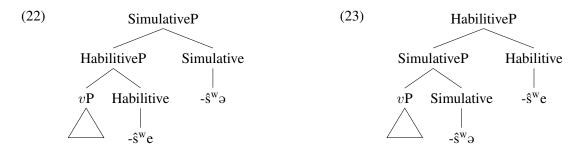
The order of morphemes within the verbal suffixal domain also corresponds to syntactic scope, as argued by Korotkova and Lander (2010): the slot labeled as TAM (tense, aspect, and mood) in Table 1 may in fact host several suffixes at a time, the order of which may vary based on their semantic scope. For example, the

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[7]The vowel within the causative prefix *ʁe-* varies in accordance with the /e/∼/a/ alternation discussed in subsection 2.2.

simulative suffix meaning 'to seem/pretend' may precede or follow the habilitive suffix meaning 'to be able to', giving rise to different scopal interpretations: in (21a) the simulative suffix appears to the right of the habilitive suffix and correspondingly takes wider scope; in (21b) we see the inverse picture: the habilitive suffix appears to the right of the simulative marker and hence takes wider scope.

(21)   a.   waŝᵂe-m ẑᵂaʁᵂe Ø- qə- Ø- tje- s- xə **-ŝᵂə -ŝᵂe**
           sky-OBL star 3ABS- DIR- 3SG.IO- LOC- 1SG.ERG- take **-HBL -SML**

           'it seems [that I can [take a star from the sky]].'

     b.   waŝᵂe-m ẑᵂaʁᵂe Ø- qə- Ø- tje- s- xə **-ŝᵂe -ŝᵂə**
           sky-OBL star 3ABS- DIR- 3SG.IO- LOC- 1SG.ERG- take **-SML -HBL**

           'I can [pretend (lit., seem) [as if I am taking a star from the sky]].' (Korotkova and Lander, 2010, 305-306)
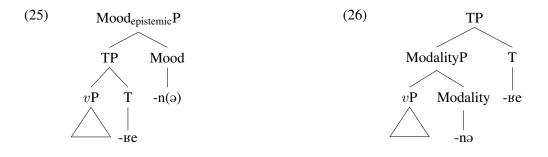
In terms of syntactic structure, this difference in scope can be represented via variation in the order of merge: in (21a) the habilitive functional projection is merged lower than the simulative head, as illustrated in (22); conversely, the opposite order of merge is observed in (21b), as shown in (23).

(22)
```
          SimulativeP
         /          \
   HabilitiveP    Simulative
    /      \           |
  vP     Habilitive  -ŝᵂə
  /\         |
 /__\      -ŝᵂe
```

(23)
```
          HabilitiveP
         /          \
   SimulativeP    Habilitive
    /      \           |
  vP     Simulative  -ŝᵂe
  /\         |
 /__\      -ŝᵂə
```

We can see similar scopal interaction with various tense and mood markers. Thus, in (24a) the modal future suffix *-nə* appears to the right of the past tense suffix *-ʁe*, rendering an interpretation of an epistemic possibility modal scoping over an event in the past tense. On the other hand, in (24b) the same modal marker appears to the left of the past tense suffix, giving rise to an interpretation whereby the past tense marker scopes over the modal operator.
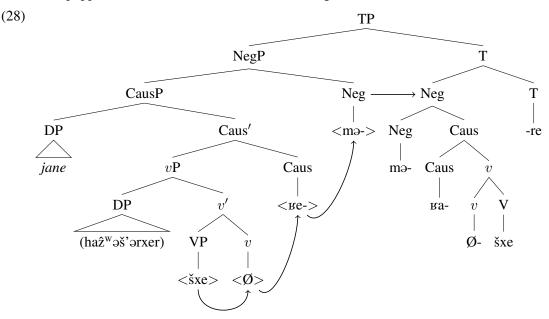
(24)   a.   Ø-ḳᵂe **-ʁe -n** (faje)
           3ABS-go **-PST -MOD** must

           'He probably went.' (lit. It should be [that he went].)

     b.   Ø-ḳᵂe **-nə -ʁe**
           3ABS-go **-MOD -PST**

           'He would go.' (lit. It was so [that he should go].) (Korotkova and Lander, 2010, 310)

As with the simulative and habilitive suffixes, the different interpretations correspond with different syntactic structures: (25) for (24a), where the functional head glossed as the future modal is used as an epistemic mood marker and it thus merged higher than the past tense projection, and (26), where the same modal is used to denote a semantically low modal operator and is correspondingly merged within the scope of a higher past tense operator.

(25)

Mood$_{\text{epistemic}}$P
- TP
  - vP
  - T
    - -ʁe
- Mood
  - -n(ə)

(26)

TP
- ModalityP
  - vP
  - Modality
    - -nə
- T
  - -ʁe

Thus, within the verbal complex both prefixes and suffixes surface in accordance with their syntactic scope. I propose that this surface order is attained via head movement from the lexical verb to the highest functional head within the extended verbal projection. Below I illustrate in (28) how the bolded verbal form in (27) is derived via head movement:[8] the lexical verb *šxe* 'eat' undergoes head movement to the causative head, which then head-moves to the negative projection, which subsequently moves to the present tense head, thus creating a single complex head.

(27) Ø-jane   Ø-   ə-   **mə- ʁa- šxe -re** haẑ$^{\text{w}}$ə-š'ər-xe-m
      3SG.PR-mother 3ABS- 3SG.ERG- **NEG- CAUS- eat -DYN** puppy-cub-PL-OBL

      'the puppies whom their mother doesn't feed' (Tg)

(28)

TP
- NegP
  - CausP
    - DP
      - *jane*
    - Caus′
      - vP
        - DP
          - (haẑ$^{\text{w}}$əš'ərxer)
        - v′
          - VP
            - <šxe>
          - v
            - <Ø>
      - Caus
        - <ʁe->
  - Neg ⟶ Neg
    - <mə->
    - Neg
      - mə-
    - Caus
      - Caus
        - ʁa-
      - v
        - v
          - Ø-
        - V
          - šxe
- T
  - T
    - -re

3.2 Phase to word mapping

While the verbal projection is assembled via head movement, the morphology that surfaces within the nominal complex is not adjoined to the nominal head via any syntactic operation, but rather is pronounced as a single unit due to rules of prosodification: the DP phase is mapped to a single phonological word. The derivation for the DP in (1), repeated below in (30), is presented in (31). The DP in question is composed of two phonological words: the possessor *adəɣa-bze-m* and the nominal complex *jə-txe-n-xebze-g$^{\text{w}}$əš'əʔa-λ*.

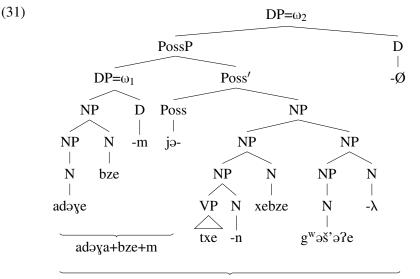[8]I have placed all verbal functional heads to the right of their complements for expository reasons. I assume that these heads may be specified as suffix or prefix. An alternative account, that is equally compatible with the data, is to assume that the verbal heads that surface as prefixes are in fact merged to the left of their complements. I will make use of this alternative account for structures in the nominal domain.

Each of these phonological words hosts exactly one /e/∼/a/ alternation at the right edge of the stem (zone D within the template in Table 1):[9]

(29) a. adəɣe+bze]$_D$+m > adəɣ**a**-bze-m
    b. jə+txe+n+xebze+gʷəš'ə?**e**+λe]$_D$ > jə-txe-n-xebze-gʷəš'ə?**a**-λ(e)

The phrase in (30) consists of two phonological words because each DP phase is mapped to a phono-logical word, allowing for cyclic DP-to-word mapping: the possessor DP is mapped to a phonological word as soon as it is formed, and the larger DP containing it is then mapped to a phonological word that excludes the possessor DP. I assume here that the possessive morpheme *jə-* is the spellout of Poss[0], a functional pro-jection which licenses a possessor DP in its specifier, and the case marker is the spellout of D[0][10] Nominal or adjectival modifiers like *adəɣe* in the first DP are merged as NP complements or modifiers to the head N. The full DP involves recursive embedding of several NPs: the nominalized verb *txen* 'writing' is a comple-ment of *xebze* 'rule', which in turn modifies the head noun *gʷəš'ə?aλ* 'dictionary'. The head noun, in turn, is composed of the derivational suffix *-λe* and the root *gʷəš'ə?e* 'word' – I assume here that this derivational root selects for an NP complement. Finally, this nominal complex includes the possessive prefix *jə-*, which is merged as Poss[0].

(30) adəɣa-   bze   -m   Ø-   jə-   [txe   -n]-   xebze- gʷəš'ə?a -λ
    Adyghe- language -OBL 3SG.PR- POSS- [write -NML]- rule-   word   -PLACE
    'the orthographic (lit. writing rule) dictionary (lit. place for words) of the Adyghe language'

(31)

This analysis is based on the proposal set forth by Compton and Pittman (2010), who argue that polysyn-thetic languages, i.e. languages with morphologically complex words and productive noun incorporation, differ from nonpolysynthetic languages in rules of mapping from syntax to PF. In particular, if we are to assume a form of Match Theory (Selkirk, 2011) as a way of mapping from syntax to PF, then a language like West Circassian differs from a synthetic or isolating language in the ranking of constraints on syntax-to-prosody mapping. In a non-polysynthetic language a syntactic word, i.e. a minimal projection of type

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[9]Note that the word-final vowel in the derivational suffix *-λe* in (29b) undergoes optional deletion in accordance with a regular phonological rule; this rule counterbleeds the /e/∼/a/ alternation (Arkadiev et al., 2009, 26-27).

[10]See Arkadiev and Testelets (2015) on the correlation between the presence of overt case marking and a DP layer in Circassian languages.

X^0, is mapped to a phonological word, and a syntactic phrase (XP) is correspondingly mapped to a phonological phrase; in some polysynthetic languages, on the other hand, a single syntactic phrase of a particular type may be mapped to a single phonological word, rather than to a prosodically more complex unit such as a phonological phrase (see discussion of this possibility in Elfner 2018, 7). Building on the assumption that the boundaries of syntactic phases are derivational points at which syntactic structure is sent to spellout, Compton and Pittman (2010) propose that the DP and CP phases in a number of polysynthetic languages are directly mapped to prosodic words. Building on their analysis, I propose an additional optimality-theoretic constraint on syntax-to-prosody mapping: in addition to the three standard constraints of Match Theory (32), a constraint that maps syntactic phases to prosodic words (33).[11]

(32) Classic Match Theory constraints (Selkirk, 2011, 439):

   a. MATCH CLAUSE:
      A clause in syntactic constituent structure must be matched by a corresponding prosodic constituent [...] in phonological representation.

   b. MATCH PHRASE:
      A phrase in syntactic constituent structure must be matched by a corresponding prosodic constituent [...] in phonological representation.

   c. MATCH WORD:
      A word in syntactic constituent structure must be matched by a corresponding prosodic constituent [...] in phonological representation.

(33) MATCH PHASE(-TO-WORD):
      A phase in syntactic constituent structure must be matched by a prosodic word in phonological representation.[12]

I propose that in West Circassian MATCH PHASE is ranked higher than MATCH PHRASE within the nominal domain, resulting in domain-relativized application of this constraint: DP phases, but not CPs, are directly mapped to a single prosodic word. Productive noun incorporation in the nominal domain is then a consequence of this mapping rule: the full nominal phrase, including any nominal or adjectival modifiers, must be pronounced as a single phonological word. Due to the fact that the CP phase, unlike the DP, is mapped to an intonational phrase, rather than a single word, verbs then do not exhibit this type of incorporation of dependent noun phrases.

This domain-relativized application of the constraint in (33) can be implemented by positing two distinct rankings of the match constraints based on whether they apply in the verbal or nominal domain. In particular, in the extended verbal domain (TP/CP) the constraint MATCH WORD is ranked higher than MATCH PHASE, while in the nominal domain (DP) MATCH PHASE is ranked above MATCH WORD; these two rankings are shown in (34). This ranking ensures that in the nominal domain X^0-type projections (e.g. the N^0 *adəɣe* or *xebze* in (30)) are not mapped to independent prosodic words in accordance with MATCH WORD, but instead become part of the bigger phonological word formed by the full DP phase. On the other hand, the same type of syntactic projection within the verbal domain (e.g. T^0 in (28)) is mapped directly to a prosodic word.[13]

(34) a. CP: MATCH WORD > MATCH PHASE

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[11]See also Gordon and Applebaum (2010), who account for a similar phenomenon in the related language East Circassian (Kabardian) as a mismatch between syntatic and prosodic structure.

[12]Compton and Pittman (2010) follow Chomsky (2001, 2008) in assuming that the spellout domain of a phase is the complement of the phase head. Here I depart from this assumption and follow Richards (2016) in treating the full phase, including the phase head and its specifiers, as the spellout domain.

[13]Alternatively, the constraint in (33) may in fact be a family of constraints: MATCH CP and MATCH DP, with the latter constraint ranked higher than MATCH WORD, and the former – lower. Either account is equally compatible with the proposed analysis.

b. DP: MATCH PHASE > MATCH WORD

The possibility of such a ranking is supported by the fact that similar rankings are necessary in order to avoid ill-formed prosodic structures in more standard cases, for example, non-branching embedding of prosodic words within prosodic phrases, or prosodic phrases within prosodic clauses Bennett et al. (2016, 189), Elfner (2018, 7-8). The existence of two category-relativized constraint rankings within a single language is not unexpected, given that phonological rules are often category-specific (Smith, 2011).

If a DP dominates another DP phase within it, e.g. the possessor DP in (30), the embedded DP is mapped to a phonological word that is morphophonologically distinct from the prosodic word that corresponds to the DP that dominates it. This is due to an additional constraint on prosodic well-formedness: prosodic constituents of the category ω cannot be dominated by constituents of that same category. I label this constraint NON-RECURSIVE in line with the Strict Layering Hypothesis developed by Selkirk (1981) *et seq*.[14] The way this constraint influences the output of a given DP is illustrated in Table 2: NON-RECURSIVE rules out an output within which one prosodic word is embedded recursively within another (a), favoring instead an output where the embedded prosodic word appears as a non-embedded phonological unit, thus violating MATCH PHASE (b). Note that while an output that would dispense of the prosodic boundaries of the embedded DP altogether, as in (c), would likewise not violate NON-RECURSIVE, this output is impossible due to the cyclic nature of spellout: I follow Richards (2016) in assuming that syntax is mapped to prosodic structure phase by phase, rather than postsyntactically after the full CP is constructed. This means that once a phase is mapped to a prosodic word, the corresponding prosodic unit cannot be tampered with and must be represented in the final prosodic structure – this idea is represented technically in Table 2 via the high-ranked constraint CYCLIC.

Table 2: Ban on recursion of prosodic words

Input:	$[_{DP}$ $[_{DP}$ ... $]$ ...$]$	CYCLIC	NON-RECURSIVE	MATCHPHASE	MATCHWORD
a.	$(_{\omega}$ $(_{\omega}$ ... $)$ ... $)$		!*		*
b. ☞	$(_{\omega}$ ... $)$ $(_{\omega}$ ... $)$			*	*
c.	$(_{\omega}$ ... ... $)$	*!		*	*

The high ranking of the NON-RECURSIVE constraint ensures that if there is any overt morphology to the left of a DP that is embedded within a larger DP, it will not be spelled out in that position, but will instead appear adjacent to the nominal head of the higher DP. This is illustrated in (35): if an embedded DP is surrounded by phonological material belonging to the higher DP – α to the left and γ to the right, the application of NON-RECURSIVE predicts that the embedded DP will not be spelled out in that position, but will instead be dislocated at PF to the edge of the higher DP.[15]

(35) $[_{DP}$ α $[_{DP}$ β $]$ γ $] \rightarrow (_{\omega}$ β $)$ $(_{\omega}$ α γ $)$

While this does not make a distinct prediction for the spellout of the phrase in (30), because the possessor DP already appears at the syntactic edge of the higher DP, it makes a difference for constructions involving an embedded DP lower in the structure, e.g. a thematic argument of a nominalized verb; these constructions will be discussed in detail in section 4.

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[14]Building on acoustic evidence for recursive prosodic structures, the ban on recursion as it was presented within the Strict Layering Hypothesis has been reevaluated in subsequent work as a violable optimality constraint; see Selkirk (1996, 2011); Truckenbrodt (1999); Ito and Mester (2013); Elfner (2015), a.o. I adapt this approach here as well, and additionally leave open the possibility that there may be several constraints on recursion based on the particular prosodic unit in question.

[15]While not overtly implemented, a similar constraint ranking must be assumed to account for the mapping of CP phases to verbal forms under Compton and Pittman's (2010) analysis: there must be a constraint that ensures that phonological words corresponding to argument DPs are not recursively embedded within the phonological word that the full CP phase is mapped to.

What appears to be nominal or adjectival incorporation in West Circassian is then in fact a case of pseudo noun incorporation in Massam's (2001) sense: it is simply the phonological outcome of a nominal or adjectival phrase appearing within a particular structural domain with the head it modifies – it need not be the result of head or phrasal movement.
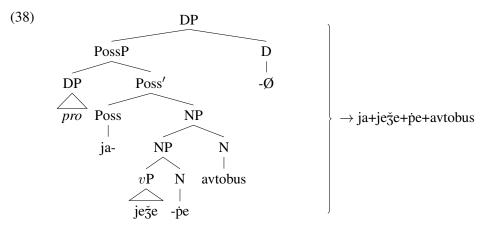
Following Barrie and Mathieu's (2016) analysis of noun incorporation in Onondaga and Ojibwe, I argue that the incorporation of lexical material in West Circassian cannot in fact be derived via head movement and is thus best analyzed as a case of a constituent remaining in situ within a larger DP, as we saw in (30). There are several reasons why lexical incorporation in West Circassian nominal phrases cannot be derived via head movement. Firstly, the incorporated material can be morphologically complex and may include its own functional morphology between two lexical roots, thus violating Baker's (2003) Proper Head Movement Generalization:

(36)   THE PROPER HEAD MOVEMENT GENERALIZATION (PHMG) (Baker, 2003, 53)
       A lexical head A cannot move to a functional head B and then to a lexical head C.

For example, a nominalized verbal form may be incorporated, with an overt nominalizer (*-ṗe*) surfacing between the incorporated lexical root and the root hosting the incorporated element (37). Additionally, the incorporated nominalized form includes the verbal applicative prefix *je-*. In order to derive the word in (37) via head movement, the verbal root *ʒe* 'read' would need to undergo head movement to the applicative head above it and subsequently to the nominalizing head *-ṗe*, with this tripartite complex head subsequently moving to the nominal lexical root *avtobus* 'bus'. This type of movement (root → affix → root) is a violation of the PHMG.

(37)   ja-   [**je**-ʒe-**ṗe**]-   avtobus
       3PL.PR+POSS- **DAT**-read-**NML**- bus
       'their school bus' (WCC)

A prosodification account, on the other hand, does not invoke any violations of this sort: the nominalized verbal form is incorporated into the full DP due to the fact that it is a caseless NP that is contained within a larger DP (38).[16]

(38)

Secondly, a direct, and desired, prediction of a head movement account of noun incorporation is that it is restricted to the theme or direct object of the incorporation host (Baker, 2009, 154). West Circassian incorporation is not subject to such a restriction. Attributive modifiers, adjectival or nominal, are productively incorporated into the nominal they modify – for most types of nominal modifiers, incorporation is the only

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[16]The syntax of nominalizations and the *v*P-internal structure in (37) are discussed in section 4.

available strategy. For example, the wordform in (39) includes the nominal modifier *šolk* 'silk' and the adjectival modifier *daxe* 'pretty'. While a complement-head relationship may be conceived for these modifiers and the semantic head *ʒene* 'dress', neither of these modifiers can be plausibly interpreted as thematically licensed by the semantic head.

(39) Ø-   jə-   zə-   **šolk- ʒene- daxe** -r
      3SG.PR- POSS- one- silk- dress- pretty -ABS
      'one beautiful dress of hers' (Lander, 2017, 84)

Finally, deverbal nominalizations exhibit incorporation of the verbal arguments (to be discussed in detail in section 4); in such cases, incorporation is not limited to the theme or direct object of the nominalized verb. Thus, the verb *ježe* 'wait' is a bivalent intransitive verb, meaning that it takes an absolutive external argument and an applicative indirect object (40a). If such a verb is nominalized, its applicative indirect object may be incorporated (40b).

(40) a. mə pŝaŝe-r(ABS) **hač'e-xe-m**(IO) Ø-ja-že
         this girl-ABS   **guest-PL-OBL** 3ABS-3PL.IO+DAT-wait
         'This girl is waiting for guests.'

      b. pŝaŝe-m Ø-   jə-   **heč'e**- je- že -n
         girl-OBL 3SG.PR- POSS- **guest**- DAT- wait -NML
         'the girl's waiting for guests' (Tg)

Furthermore, even an external argument may be incorporated into a deverbal nominalization. Thus, if a transitive verb like *thač'ə* 'wash' (41a) is nominalized, both the internal and external arguments may be incorporated into the nominalized form (41b).

(41) a. mə **pŝaŝe-m**(ERG) laʁe-xe-r(ABS) Ø-j-e-thač'ə
         this **girl-OBL**   dish-PL-ABS   3ABS-3SG.ERG-DYN-wash
         'This girl is washing the dishes.'

      b. **pŝeŝe**- leʁe- thač'ə -č'e -r
         girl- dish- wash -NML -ABS
         'girls' dish-washing' (Tg)

Thus, a head movement analysis cannot be easily applied to the West Circassian incorporation data. A prosodification account, on the other hand, readily predicts the observed structural configurations.

The following section presents evidence for the necessity of both types of word-formation strategies: prosodification in the nominal domain and head movement in the verbal domain.

4 Deriving nominalizations

In the previous section I have proposed two distinct word formation strategies for the West Circassian wordform: head movement in the verbal domain and rules of syntax-to-prosody mapping in the nominal domain. This section presents a case where both strategies of word formation are necessary in order to account for the observed morpheme order – noun incorporation in verbal nominalizations.

Like nonderived nominals, verbal nominalizations display argument incorporation, but the incorporated lexical material must appear to the left of any verbal functional morphology, thus violating the West Circassian morphological template, according to which incorporated lexical material appears next to the incorporating root. I argue that the observed morpheme order may only be derived via head movement of the verbal

morphology, resulting in concatenation of the verbal form to the exclusion of the incorporated argument, while the incorporated argument remains stranded in its base position.

The assumption that the incorporated argument remains in its base position stems out of the impossibility of deriving noun incorporation via head movement, as has been shown in subsection 3.2, and is supported by two additional pieces of evidence: (i) the syntactic presence of the external argument within the nominalized construction, which then would serve as an intervener for movement-derived incorporation of the internal argument; and (ii) the Incorporation Hierarchy, which governs the order in which arguments may surface within a deverbal nominalization – this hierarchy directly follows the underlying argument structure of the corresponding predicate.

The proposed analysis then provides an account for why noun incorporation is unavailable in the verbal complex – verbs are constructed in the syntax via head movement, but noun incorporation is phonological and licensed only within a DP projection via the MATCH PHASE mapping constraint.
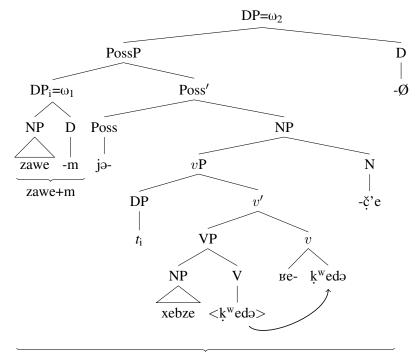
4.1 The analysis

This subsection summarizes the analysis of the morphological makeup of verbal nominalizations. Since these constructions contain both verbal and nominal functional structure, their derivation involves both strategies of word formation (phase to word mapping and head movement). Structurally, verbal nominalizations in West Circassian involve a nominalizing head selecting for a verbal projection smaller than TP, but which includes the full vP containing the thematic arguments of the nominalized verb. In the absence of T^0, the arguments within the nominalized vP are not assigned absolutive or ergative case, but must instead be licensed as a possessor or must surface as a caseless bare NP, resulting in a generic, indefinite interpretation. The verbal form is concatenated via head movement of the verbal root and verbal functional morphology into a single complex head, while caseless NP arguments remain in situ in their base generated position. This derives the surface order of the morphemes within the nominalized form: the verbal root appears adjacent to any verbal prefixes, and incorporated nominals appear to the left of this complex verbal form.

Phases are sent to spellout cyclically: if there are any phases (DP or CP) embedded within the nominalized DP, they are be spelled out as separate prosodic units due to the NON-RECURSIVE constraint. The ranking of match constraints governing the mapping from syntax to prosody (discussed in subsection 3.2) are determined at the phase edges. This means that within a CP, MATCH WORD is ranked higher than MATCH PHASE, rendering each phonologically overt projection of type X^0 as a separate phonological word. Within a DP, on the other hand, MATCH PHASE is ranked highest, thus leaving projections of type X^0 to be spelled out as parts of the larger phonological word corresponding to the full DP. For verbal nominalizations this means that an argument that is successfully licensed as a DP (e.g. the possessor) is spelled out as a separate phonological word, but NPs that remain in situ within the vP are spelled out as part of a single phonological word together with any other material within the full nominalized DP, such as possessive morphology, the nominalizing suffix and the complex head containing the verbal root and verbal functional morphology.

This derivation is illustrated for (42a) in (42b): the causative form of the verb ƙʷedə 'perish' is nominalized with the suffix -č'e. The external argument (the causer) is introduced as the specifier of the causative v^0, and the internal argument (the causee) – as the complement of the lexical verb. The causer is a full DP that is assigned oblique case by Poss^0 and correspondingly raises to Spec,PossP. The internal argument, on the other hand, remains in situ within VP as a caseless NP. The nominalized construction contains two spellout domains: the possessor DP, which is mapped to a separate phonological word, and the full nominalized DP, which includes the internal argument, the causative prefix, the nominalizer and the possessive prefix in Poss^0. Since within DP, MATCH PHASE is ranked higher than MATCH WORD, all elements within the nominalized DP (to the exclusion of the possessor DP) are spelled out as a single complex word. Note that the internal argument NP is merged adjacent to the verbal root that selects for it, but this adjacency is not preserved in the phonological spellout of the word – this is due to V^0 undergoing head movement to form a

complex head with the causative v^0.

(42) a. [$_{DP}$ [$_{DP}$ zawe-m]$_i$ Ø-   jə-   [$_{vP}$ t_i [$_{NP}$ xebze]- ʁe-   ḳʷedə] -č̣'e]
            war-OBL   3SG.PR- POSS-   rule-   CAUS- perish -NML

       'the war's destruction (lit. causing to perish) of traditions' (Tg)

b.

jə+xebze+ʁe+ḳʷedə+č̣'e

The remainder of this section provides the empirical support for this analysis. Subsection 4.2 argues that nominalized constructions involve a structure that includes the full vP, but excludes T^0. Subsection 4.3 explains how the presence of the full verbal argument structure in these nominalizations accounts for ordering constraints that the arguments of the nominalized verbs are subject to. Finally, subsection 4.4 analyzes the violations of the morphological template that are observed in nominalized verbal forms as a consequence of the two word formation strategies applying within the same wordform.

4.2 The functional structure of nominalizations

This paper focuses on three types of nominalized constructions: (i) the action nominal marked with the suffix -*n(ə)* (43a), (ii) the manner nominal marked with the suffix -*č̣'e* (43b), and (iii) the place nominal marked with the suffix -*ṗe* (43c). All three suffixes can be productively combined with verbal stems, yielding a construction that exhibits the syntactic behavior typical of a noun phrase.[17]

(43) a. pŝaŝe-m Ø-   jə-   leʁe- thač̣'ə -**n**   səgʷ rjehə
        girl-OBL 3SG.PR- POSS- dish- wash -**NML**   I like

        'I like the girl's dish-washing.'

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[17]The suffix -*n(ə)* displays a number of additional uses, all of which involve a finite predicate. While Serdobolskaya (2009) argues that the various uses of this suffix can be conflated into a single semantic profile, in this paper I distinguish the nominalizing use of this suffix from other uses – in the latter case this suffix is glossed as MOD (modal future), following Lander and Bagirokova (2015).

b. pŝaŝe-m Ø-　　 jə- leʁe- thač̣’ə -**č̣’e**　 səgʷ rjehə
　　 girl-OBL 3SG.PR- POSS- dish- wash -**NML**　 I like

　　 'I like the girl's manner of dish-washing.'

c. mə č̣’əp̣e-r　 pŝaŝe-m Ø-　　 jə- leʁe- thač̣’ə -**p̣e**　　 Ø-s-ŝə-ʁe
　　 this place-ABS girl-OBL 3SG.PR- POSS- dish- wash -**NML**　 3ABS-1SG.ERG-do-PST

　　 'I made this place the girl's place for dish-washing.' (Tg)

I argue that these three nominalizers all select for a projection which includes the full vP, but crucially excludes T^0, which is responsible for licensing absolutive and ergative case assignment. I further show that the nominalized verbal phrase includes the full argument structure of the predicate it is derived from. In particular, if a bivalent predicate is nominalized, both the internal and external arguments are syntactically present within the nominalized construction (44).

(44)

```
                    NP
                  /    \
               vP        N
             /    \      |
        ExtArg    v'    -NML
                 /  \
               VP    v
              /  \
         IntArg   V
```

As a nominal phrase, these nominalized constructions can appear in all syntactic positions accessible for DPs in West Circassian: as an ergative external argument (45), an applicative indirect object (46), an absolutive theme (47), or a complement of a postposition (48).

(45)　[w-jə-beʒe-š’xəpc̣ə-č’e](ERG)　　 s-jə-ʁe-rehatə-r-ep
　　　 2SG.PR-POSS-fox-smile-NML　　 1SG.ABS-3SG.ERG-CAUS-calm-DYN-NEG

　　　 'The way you smile like a fox causes me discomfort.' (Bz)

(46)　zeč’e Ø-Ø-je-že-x　　　　　 [č’ele-qe-ḳʷe-ž’ə-nə] -m(IO)
　　　 all　 3ABS-3SG.IO-DAT-wait-PL　 boy-DIR-go-RE-NML -OBL

　　　 'Everyone is waiting for the returning of the young men.' (Bz)

(47)　mafe qes　 [je-ʒe-p̣e-ḳʷe-nə]　　 -r(ABS) Ø-s-e-ʁe-c̣ač’e
　　　 day every　 DAT-read-NML-go-NML -ABS　 3ABS-1SG.ERG-DYN-CAUS-complete

　　　 'Every day I take on the task of going to school (lit. I carry out school-going).' (Bz)

(48)　se stol Ø-t͡ṣ̂ə-ʁe　　　　　 [leʁe-ʁʷəš’ə-ž’ə-nə] -m(PP) paj
　　　 I table 3ABS-1SG.ERG-do-PST dish-dry-RE-NML　 -OBL for

　　　 'I set the table for dish-drying'. (Bz)

Nominalized structures differ drastically from other types of clausal embedding: while embedded clauses retain regular verbal agreement and case marking of participants, nominalizations do not display ergative or absolutive agreement, and cannot assign the corresponding cases to its arguments. Arguments which are not assigned case by the verb must either surface as an incorporated nominal, or as a possessor. Thus, in (49a)

the embedded transitive predicate that is marked with a factive subordinating prefix[18] displays agreement with the ergative and absolutive arguments, and assigns oblique and absolutive case to the corresponding nominals. On the other hand, if the same predicate undergoes nominalization with one of the prefixes listed above, it no longer displays overt verbal agreement with the arguments, and the corresponding nominals are not assigned oblique or absolutive case (49b). The arguments must instead be incorporated or licensed as a possessor of the newly formed nominal phrase, as shown in (43a)-(43c).

(49) a. [adre-**me**(ERG) laʁe-**r**(ABS) **Ø**-zer-**a**-thač'ə-re-m
          other-**PL.OBL** dish-**ABS** **3ABS**-FACT-**3PL.ERG**-wash-DYN-OBL
          s-Ø-je-pʌə-nə-r   səgʷ rjehə
          1SG.ABS-3SG.IO-DAT-watch-MOD-ABS I like
          'I like to watch other people wash dishes.' (Tg)

      b. * [pŝaŝe-**m** laʁe-xe-**r**   thač'ə-nə] -r   səgʷ rjehə
          girl-**OBL** dish-PL-**ABS** wash-NML -ABS   I like
          Intended: 'I like the girl's washing of dishes.' (Tg)

In contrast with ergative and absolutive cross-reference marking and case assignment, the nominalized predicate may retain personal markers referring to the applicative indirect object, and the corresponding nominal may retain oblique case marking. For example, the verb *jetə* 'give' usually takes three arguments: an ergative agent, an absolutive theme, and an indirect object. The ϕ-features of the indirect object are expressed on the verb via a cross-reference marker that is immediately followed by the dative applicative prefix *je-/e-/r-* (the form of the prefix is phonologically conditioned). (50a) is an example of this three-place predicate in a finite context: we can see all three arguments are assigned their respective case values, and the predicate displays cross-reference morphology referring to each of the arguments. If this predicate is nominalized, the ergative agent and absolutive theme may not retain the case marking that is assigned in a finite clause. Thus, in (50b)-(50c) the ergative agent is expressed as a possessor and the absolutive theme is incorporated into the nominalized form; this correlates with the absence of the corresponding cross-reference morphology on the nominalized predicate. The noun phrase referring to the indirect object, on the other hand, is assigned its regular oblique case marking and the nominalized verb retains the cross-reference morphology relating to this argument. Note that the linear position of the indirect object within the noun phrase is not fixed: it may appear after the possessor (50b) or before it (50c).

(50) a. mə ŝʷəzə-m   Ø-jə-sabəj-xe-**m**   ǯane-xe-r
          this woman-OBL 3SG.PR-POSS-child-PL-OBL dress-PL-ABS
          Ø-a-r-jə-tə-ʁ
          3ABS-3PL.IO-DAT-3SG.ERG-give-PST
          'This woman gave dresses to her children.'

      b. mə ŝʷəzə-m   Ø-jə-sabəj-**me**   Ø-jə-ǯene-**ja**-tə-n
          this woman-OBL 3SG.PR-POSS-child-**PL.OBL** 3SG.PR-POSS-dress-**3PL.IO+DAT**-give-NML
          səgʷ rjehə
          I like
          'I like that this woman gives dresses to her children.'

      c. Ø-jə-sabəj-**me**   mə ŝʷəzə-m   Ø-jə-ǯene-**ja**-tə-n
          3SG.PR-POSS-child-PL.OBL this woman-OBL 3SG.PR-POSS-dress-**3PL.IO+DAT**-give-NML

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[18]Embedded clauses marked with the factive prefix *zer(e)*- are generally analyzed as a type of relative clause; see Gerasimov and Lander (2008), Caponigro and Polinsky (2011, 103-111), Lander (2012b, 296-309) on the semantic and morphosyntactic properties of the factive prefix.
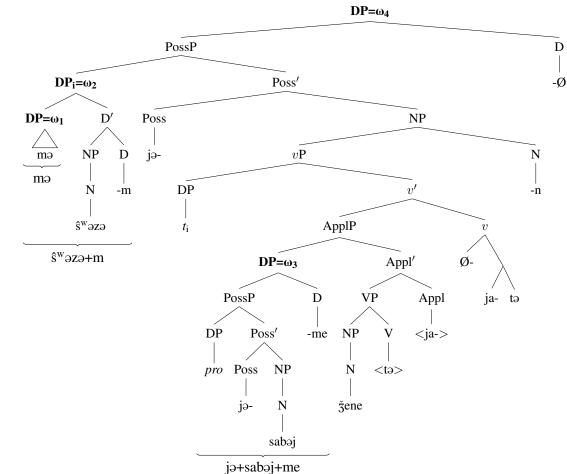
səgʷ rjehə

I like

'I like that this woman gives dresses to her children.' (Tg)

The fact that absolutive and ergative case and cross-reference marking are unavailable in nominalizations suggests that the head that is responsible for the assignment of these case values and the licensing of cross-reference morphology is absent in these constructions. I propose that this head is T^0 – this is corroborated by the fact that tense-related morphology may not be used on a nominalized predicate: attempts to attach the nominalizing suffix to a predicate marked with the future, modal future or past tense suffix renders an illicit wordform (51). The availability of the case assigned to the applicative indirect object, on the other hand, suggests that this case may be licensed in the absence of T^0.

(51) a. * ḳʷe-**te**-č'e
           go-**FUT**-NML

      b. * ḳʷe-**nə**-č'e
           go-**MOD**-NML (Bz; Chernyshev 2014)

      c. * ḳʷe-**ʁa**-č'e
           go-**PST**-NML (Bz)

In section 2.3 I proposed the following analysis for case assignment in the language: absolutive case is assigned by T^0, while the ergative and applicative arguments are assigned inherent oblique case by v^0 and $Appl^0$ respectively; this configuration is illustrated in (17). Absolutive case is then unavailable in nominalizations due to the absence of T^0 in the relevant construction. In regards to ergative case, I propose, following similar proposals for accusative case (Watanabe, 1996; Kishimoto, 2006), that v^0 may only assign ergative case in the presence of T^0 (see also Legate 2008 on the dependence of inherent ergative case assignment in Hindi on the presence of perfective aspect). Since T^0 is the locus of absolutive case assignment, ergative case in West Circassian is then predicted to be impossible in the absence of an absolutive argument – a prediction that is borne out: no predicate in the language assigns ergative case in the absence of an absolutive argument (see e.g. Arkadiev et al. 2009, 75). Thus, this restriction on ergative case assignment is essentially an alternative implementation of the dependent case approach to ergative case advocated by Marantz (2000); Deal (2010); Baker (2014), among others. The case-assigning function of $Appl^0$, on the other hand, does not depend on the presence of T^0 – thus, oblique case may be assigned to the indirect object within a nominalized construction.

(52)

PossP
DP$_i$=ω$_2$, Poss′

DP=ω$_1$, D′
mə
mə
NP, D
N, -m
ŝ^{w}əzə
ŝ^{w}əzə+m

DP=ω$_4$
D
-Ø

Poss, NP
jə-
vP, N
-n
DP, v′
t$_i$
ApplP, v
Ø-
DP=ω$_3$, Appl′
ja- tə
PossP, D
-me
VP, Appl
<ja->
DP, Poss′
pro, Poss, NP
jə-, N
sabəj
NP, V
N
ʒene
<tə>

jə+sabəj+me

jə+ʒene+ja+tə+n

The derivation of the nominalized construction in (50b)-(50c) is represented in (52): the only DP within the vP that is assigned case in situ is the applicative indirect object. In the absence of T^0, the theme remains as a caseless NP in its base position and is subsequently pronounced as an incorporee of the nominalized verb. Since v^0 does not assign ergative case, the external argument also remains caseless until the merging of Poss^0 above the nominalizer, which then assigns case to the highest eligible DP within its scope – the external argument – and attracts it to its specifier. Within the possessor DP, the demonstrative *mə* is spelled out as a separate phonological word due to its phrasal status. The indirect object DP is also spelled out as a separate phonological word. While the indirect object DP appears to the right of the possessive prefix belonging to the higher DP, it surfaces to the left of it due to the NON-RECURSIVE constraint: the phonological words corresponding to the indirect object and possessor DPs are spelled out as separate phonological words and thus cannot be embedded within the phonological word corresponding to the higher DP. I assume that the variable order of the possessor and indirect object in (50b)-(50c) is made possible by DP-internal scrambling: the indirect object may be optionally scrambled to adjoin at the edge of DP.

Given that ergative case isn't assigned within the nominalized construction, one might suppose that the external argument is altogether absent from these nominalizations, and the possessor that we see in (50b)-(50c) is merely interpreted as the external argument, but is not introduced by v^0 (cf. Legate 2008, 63 on Warlpiri). However, there is evidence that both the functional head that introduces the external argument and the external argument itself are structurally present in these constructions. Firstly, the nominalized predicate may contain an overt causative morpheme – a type of external argument introducing functional projection

(53).

(53) zarjəne Ø-   jə-   keše-   **ʁe**-   ẑʷa -č'e
      Zarina 3SG.PR- POSS- porridge- **CAUS**- boil -NML
      'Zarina's way of making (lit. boiling) porridge' (Tg)

Secondly, there is evidence that the external argument is syntactically present in these constructions, either as an incorporated noun phrase, a possessor, or a non-obligatory control PRO. The evidence comes from the following diagnostics:

1. The ability of the external argument to bind anaphors within the vP.

2. The ability of the external argument to be modified by the adverbial intensifier *jež'jež'rew* (the form of the intensifier varies with person).

3. The ability of the external argument to be the controller of a depictive secondary predicate.

Firstly, the external argument may bind reciprocal and reflexive anaphors within the nominalized construction. Anaphoric binding is generally expressed morphologically via the replacement of the cross-reference marking referring to that argument with a specialized marker: *zə-* for the reflexive and *ze(re)-* for the reciprocal.[19] Thus, if a transitive predicate with an ergative agent and absolutive theme such as *fepe-* 'dress' in (54a) is reflexivized, the cross-reference morphology referring to the absolutive argument – third person in (54a) – is replaced with the absolutive prefix *zə-* (54b).

(54) a. zeč'e sabəj-xe-r   **Ø**-s-fepa-ʁe-x
          all   child-PL-ABS **3ABS**-1SG.ERG-dress-PST-PL
          'I dressed all the children.' (Tg)

      b. **zə**-s-fepa-ʁ
          REFL.ABS-1SG.ERG-dress-PST
          'I dressed myself.' (Tg)

Reciprocality is similarly expressed via the replacement of one of the cross-reference prefixes. For example, in order to express a reciprocal relation between the theme and the indirect object of the ditransitive predicate *pχə-* 'tie smth to smth' (55a), the cross-reference prefix corresponding to the indirect object – second person singular in (55a) – is replaced with the reciprocal prefix *ze-* (55b).

(55) a. Ø-**w**-e-s-pχə-ʁe-x
          3ABS-**2SG.IO**-DAT-1SG.ERG-tie-PST-PL
          'I tied them to you.' (Tg)

      b. Ø-**z**-e-s-pχə-ʁe-x
          3ABS-**REC.IO**-DAT-1SG.ERG-tie-PST-PL
          'I tied them to each other.' (Tg)

Both reflexives and reciprocals can be used in the nominalizations under discussion. In (56) we can see the reflexive prefix on the nominalized predicate; in the absence of an overt external argument, it is straightforward to assume that it is bound by a phonologically null PRO.

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[19]The final vowel of both affixes is often omitted for phonological reasons; the allomorph *zere-* is used to mark the reciprocal relation between an ergative and an absolutive participant (Arkadiev et al. 2009, 63-64; Letuchiy 2010, 339-344).

(56) [PRO$_i$ **zə$_i$**-fepe-nə]   -r   səg^w rjəhərep
         REFL.ABS-dress-NML -ABS   I don't like

'I don't like getting dressed' (Tg)

In (57a) we can see the use of the reciprocal marker to mark the comitative applied object within the nominalized construction. In this case, the only overtly expressed potential binder for the reciprocal is the first person singular experiencer of the matrix predicate. However, not only is this argument outside the binding domain of the reciprocal, but a reciprocal anaphor requires a plural antecedent. This leads us to conclude that there must be a plural PRO within the nominalization to license the reciprocal. The fact that the antecedent of a reciprocal must be plural is shown in (57b), where a finite embedded clause is used instead of the nominalization we see in (57a). This sentence is only grammatical if the antecedent of the reciprocal – expressed here via absolutive agreement on the embedded predicate – is plural.

(57)   a. [PRO$_{i+}$ qə-**ze$_{i+j}$**-de-ŝ^{w}e-nə]   -r   *pro$_i$* səg^w rjehə
             DIR-**REC.IO**-COM-dance-NML -ABS   I like

'I like paired dancing (lit. dancing with each other)' (Tg)

       b. {tə$_{i+j}$-,*sə$_i$-}qə-**ze$_{i+j}$**-de-ŝ^{w}e-nə-r   səg^w rjehə
          1PL.ABS-/*1SG.ABS-DIR-**REC.IO**-COM-dance-MOD-ABS I like

'I like for us (/*for me) to dance with each other.' (Tg)

Secondly, the external argument may be modified by an adverbial intensifier *jež'jež'rew*. This adverbial intensifier is generally used to modify an agentive participant in a finite clause. For example, in (58) the intensifier modifies the ergative argument *pŝaŝem* 'girl'. This intensifier varies in form with the person of the participant it modifies, thus, in (59) it takes the first person form in correspondence with the external argument.

(58)   mə pŝaŝe-m **jež'-jež'-r-ew**   laʁe-xe-r   Ø-j-e-thač'ə
       this girl-OBL **self-self-PRED-ADV** dish-PL-ABS 3ABS-3SG.ERG-DYN-wash

'This girl is washing the dishes by herself.' (Tg)

(59)   **se-r-se-r-ew**   laʁe-xe-r   Ø-s-e-thač'ə
       I-PRED-I-PRED-ADV dish-PL-ABS 3ABS-1SG.ERG-DYN-wash

'I wash the dishes by myself.' (Tg)

This intensifier may only modify an argument that is syntactically present: for example, it may not refer to the implicit agent of a resultative passive (60); in this case it may only refer to the internal argument, rendering a semantically odd interpretation.[20] This intensifier is further limited to verbal arguments – thus, it may not be used to modify a possessor of a non-derived nominal (61).

(60)   laʁe-r   Ø-thač'ə-ʁe   (#**jež'-jež'-r-ew**)
       dish-ABS 3ABS-wash-PST **self-self-PRED-ADV**

'The dish is washed (#by itself / *by oneself).' (Tg)

(61)   (***jež'-jež'-r-ew***)   mə pjəsatjeljə-m Ø-jə-txəλ   deʁ^w-ded
       self-self-PRED-ADV this writer-OBL   3SG.PR-POSS-book good-very

'This writer's book (*by herself) is very good.' (Tg)

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[20]For details on the syntactic and semantic properties of the resultative passive construction see Arkadiev (2016).

While unavailable in non-derived nominals, the intensifier *jež'jež'rew* may be used to modify the external argument of a nominalized predicate: in (62) the intensifier modifies the third person external argument expressed as the possessor of the nominalized predicate; in (63) the intensifier modifies the unexpressed first person external argument of the nominalized predicate, correspondingly appearing in the first person form.

(62) **jež'-jež'-r-ew** pŝaŝe-m Ø-jə-leʁe-thač'ə-č'e səgʷ rjehə
    self-self-PRED-ADV girl-OBL 3SG.PR-POSS-dish-wash-NML I like
    'I like how the girl washes the dishes by herself.' (Tg)

(63) [**se-r-se-r-ew** PRO leʁe-thač'ə-nə] -r səgʷ rjehə
    I-PRED-I-PRED-ADV dish-wash-NML -ABS I like
    'I like washing dishes by myself.' (Tg)

Finally, the external argument in a nominalization may be the controller of a depictive secondary predicate. Depictive secondary predicates are expressed in West Circassian as a stative predicate marked with the adverbial case marker *-ew*; with the exception of a very limited set of predicates, depictives carry overt absolutive agreement referring to its controller – one of the arguments of the matrix verb.[21] An example of a depictive secondary predicate can be seen in (64): the predicate *səmaʒe* 'be sick' is used to denote the state of the absolutive argument of the matrix clause (*pŝaŝer* 'girl'). As a depictive predicate, it is correspondingly marked with adverbial case and carries personal cross-reference morphology relating to the argument it modifies (in this case it is phonologically null).

(64) mə pŝaŝe-r hač'e-me Ø-a-pe-ʁʷeč'ə-ʁ **Ø-səmaʒ-ew**
    this girl-ABS guest-PL.OBL 3ABS-3PL.IO-LOC-greet-PST **3ABS-sick-ADV**
    'This girl greeted the guests while sick.' (Tg)

Depictive secondary predicates cannot be used to denote the state of an implicit argument. Thus, they cannot be used to express the state of the omitted agent in a resultative passive construction (65).

(65) laʁe-r Ø-thač'ə-ʁe **(*Ø-səmaʒ-ew)**
    dish-ABS 3ABS-wash-PST 3ABS-sick-ADV
    'The dish is washed (*while sick).' (Tg)

This type of secondary predicate may be used to express the state of the external argument in a nominalized construction, even if it is not overtly expressed (66), thus indicating that the external argument is present within the nominalization as a phonologically null PRO.

(66) [**Ø-səmaʒ-ew** PRO heč'e-pe-ʁʷeč'ə-nə] -r dejə
    3ABS-sick-ADV guest-LOC-greet-NML -ABS bad
    'It is bad to greet guests while sick.' (Tg)

Thus, the nominalized construction includes the full *v*P. Other verbal functional material that may be included in the nominalization includes low scope prefixal negation *mə-* (67) and low aspectual or affixal event modifiers, such as the refactive suffix *-ž'ə* (68) and the simulative suffix *-ŝʷe* (69). Thus, the nominalized projection may be slightly larger than *v*P in order to include negation and aspectual functional material. Crucially, as we saw in (51), nominalizations may not include a tense projection, which correlates with the lack of absolutive and ergative case in these constructions.

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[21]For a detailed description of depictive secondary predication in West Circassian see Vydrin (2008).

(67) w-jə-aqče-ja-**mə**-tə-č'e　　　　　　hejnape-m　nesə-ʁ
　　 2SG.PR-POSS-money-3PL.IO-NEG-give-NML　shame-OBL reach-PST

　　 'Your unwillingness to give money (lit. your manner of not giving money to them) has become
　　 shameful.' (Bz)

(68) zeč'e Ø-Ø-je-ž'e-x　　　　　　č'ale-me　　ja-qe-ḳʷe-**ž'ə**-n
　　 all　 3ABS-3SG.IO-DAT-wait-PL boy-PL.OBL 3PL.PR+POSS-DIR-go-**RE**-NML

　　 'Everyone is waiting for the young men's return.'

(69) w-jə-qe-ŝʷe-**ŝʷe**-n　　　　　　　　Ø-s-je-zeš'ə-ʁ
　　 2SG.PR-POSS-DIR-dance-**SML**-NML 3ABS-1SG.IO-DAT-tire-PST

　　 'I'm tired of your bad dancing.' (Bz)

4.3　Constraints on argument encoding in nominalizations

As mentioned in the previous subsection, the arguments of a nominalized predicate may not be assigned
ergative or absolutive case – they must instead surface as a stem that is incorporated into the nominalized
predicate or as a possessor that is then cross-referenced in the nominalization with a corresponding posses-
sive prefix. While both strategies are available to all types of arguments, external and internal alike, the
order in which these arguments appear is restricted – in particular, the arguments must be organized based
on the constraint in (70); this order is schematically represented in (71).

(70) ORDERING CONSTRAINT ON ARGUMENTS IN NOMINALIZATION:
　　 If a bivalent predicate is nominalized and both arguments are overtly expressed in the nominaliza-
　　 tion, the internal argument must appear closer to the verbal root than the external argument.

(71) External argument – Internal argument – Verb

　　 The constraint in (70) holds for all types of bivalent predicates: transitive verbs with an ergative external
argument and absolutive theme, intransitive verbs with an absolutive external argument and applicative
internal argument, and so-called inverse predicates with an applicative experiencer and an absolutive theme.
The generalizations in terms of ordering arguments are summarized in (72).[22]

(72)　a. Transitive (ERG-ABS): ergative – absolutive – verb
　　　 b. Intransitive (ABS-IO):　absolutive – oblique – verb
　　　 c. Inverse (IO-ABS):　　　oblique – absolutive – verb

　　 Such a rigid restriction on the order of elements within a nominalized vP is striking for West Circassian
given that the order of arguments within a full clause is rampantly free (see e.g. Lander 2012b, 90). If word
order in full clauses is achieved via scrambling, it is then apparent that nominalizations lack projections that
can host scrambled nominals, thus significantly restricting possible argument order permutations. Given
the highly restricted order of arguments in these constructions, it is reasonable to assume that the surface
order of arguments directly reflects their order of merging, and noun incorporation is then not derived via
movement, but is prosodic, rather than syntactic. Nominalized constructions for each type of predicate and
how they are derived within the proposed analysis are presented below.

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[22]Note that the case-licensed applicative DP as in (50b)-(50c) is not subject to this ordering constraint and may surface both
before or after the structurally higher external argument. The reason for this is that this type of scrambling to a position above the
possessor in Spec,PossP is only possible for full DPs, and not caseless NPs. Since a West Circassian nominal may only license at
most one possessor, only one of the arguments of a nominalized bivalent predicate may be expressed as a full DP, and the other is
necessarily an incorporated NP which remains in situ in its base position.

4.3.1 Bivalent verb with an ergative-absolutive frame

The predicate *thač̣'ə* 'wash' is an example of a transitive two-place predicate: in (73a) it is used in a finite clause; the theme *laʁexer* 'dishes' is marked with the absolutive case, and the agent *pŝaŝem* 'girl' carries the oblique case marker that is assigned to ergative arguments. In case this predicate is nominalized, the absolutive argument must appear closer to the verbal root than the ergative argument. This can be seen in (73b), where the noun *leʁe* 'dish' is now incorporated into the predicate, and the ergative agent is expressed as a possessor; (73c) shows that the arguments may not be switched in position without a change in meaning, in this case rendering a semantically odd utterance.

(73)   a.   mə   pŝaŝe-m(ERG)   laʁe-xe-r(ABS)   Ø-j-e-thač̣'ə
            this girl-OBL   dish-PL-ABS   3ABS-3SG.ERG-DYN-wash
            'This girl is washing the dishes.' (Tg)

       b.   pŝaŝe-m   Ø-jə-leʁe-thač̣'ə-č̣'e   səgʷ rjehə
            girl-OBL 3SG.PR-POSS-dish-wash-NML I like
            'I like the girl's manner of dish-washing.' (Tg)

       c.   #laʁe-me   ja-pŝeŝe-thač̣'ə-č̣'e   səgʷ rjehə
            dish-PL.OBL 3PL.PR+POSS-girl-wash-NML I like
            Intended: 'I like the girls' manner of washing dishes.'
            #'I like the dishes' manner of washing girls' (Tg)

The surface order of arguments we see in (73b) is derived as illustrated in (74): the internal argument *leʁe* 'dish' is introduced as a complement of the lexical verb *thač̣'ə* 'wash', while the external argument *pŝaŝe* 'girl' is merged above it as the specifier of v^0. The internal argument, being a simple NP, does not require case assignment to be licensed and is thus free to remain in situ in its base position. The external argument, on the other hand, is a DP and thus must raise to the specifier of the higher Poss^0 in order to receive case. The full nominalized DP is then spelled out as a single phonological word, with the internal argument pronounced as an incorporee of the nominalized verb and the external argument DP mapped to a separate phonological word.
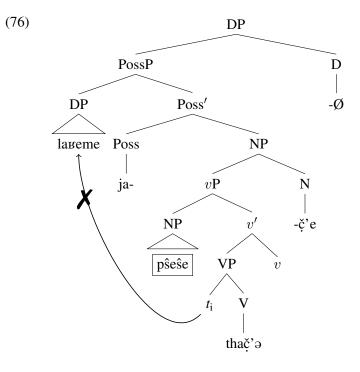
(74)

In the ill-formed (73c) the internal argument is expressed as a full DP that is cross-referenced as a possessor on the nominalized predicate, while the external argument *pŝeŝe* 'girl' is incorporated. This configuration would involve the movement of the DP *laʁeme* 'dishes' from the position of the internal argument

to the specifier of the higher Poss^0, illustrated in (76) – this movement is blocked, however, by the presence of the external argument in its movement path: Poss^0 cannot probe for the internal argument due to the Minimal Link Condition (Chomsky, 1995).

Note that the ill-formedness of (73c) is not due to the external argument being expressed as an incorporated NP – this is a possible structural configuration, as long as the internal argument remains in situ, as can be seen in (41b), repeated below in (75a). Importantly, as in (73c), the order of the arguments cannot be reversed: the resulting expression in (75b) receives a semantically odd interpretation wherein the dishes receive the theta-role as the external argument.

(75) a. **p̂ŝeŝe-** leʁe- thač̣'ə -č'e   -r
          girl-   dish- wash -NML -ABS
          'girls' dish-washing (Tg)'

      b. # leʁe- **p̂ŝeŝe-** thač̣'ə -č'e   -r
          dish- **girl-**   wash -NML -ABS
          Intended: 'girls' dish-washing'
          #'dishes' girl-washing'

(76)

The expression of the internal argument as a possessor likewise cannot be the source of ill-formedness in (73c): it is possible for the internal argument to be expressed as a possessor in a nominalized construction if the external argument remains unexpressed (77).

(77) marə **laʁe-me**   ja-thač̣'ə-p̣e
      here **dish-PL.OBL** 3PL.PR+POSS-wash-NML
      'This is where the dishes are washed.' (Tg)

I assume that the nominalized construction in (77) involves a smaller functional structure than the nominalizations discussed here and does not include an external argument at all. This ensures that such an external argument does not serve as an intervener for the movement of the internal argument DP to the

higher Spec,PossP. Recall, however, that such an analysis is not available for cases wherein both arguments are overtly expressed as in (73b), or where the phonologically null external argument can be diagnosed based on syntactic tests.
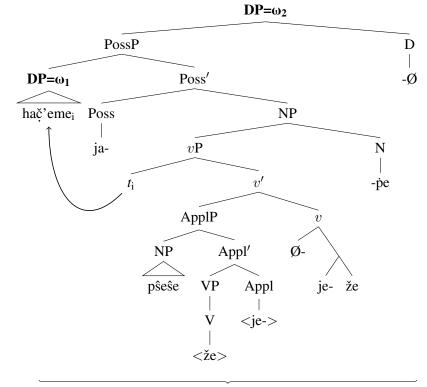
Thus, the ill-formedness of (73c) is due to the order in which the verbal arguments appear, which is readily accounted for if we assume that incorporated arguments are NPs that remain in situ, while full DPs must raise to Spec,PossP for case licensing. This pattern holds not only for verbs with an ergative-absolutive frame, as shown below.

4.3.2 Bivalent verb with an absolutive-applicative frame

An example of a bivalent predicate that takes an absolutive subject and an indirect applied object is *ježe* 'wait': when used in a finite clause (78a), the external argument (here – *pŝaŝer*) takes the absolutive case marker *-r*, while the applied indirect object *hač'eme* is marked with the oblique case marker (here – the portmanteau morpheme *-me* 'PL+OBL'). If this predicate is nominalized and both arguments are overtly expressed, the external argument which was assigned absolutive case in the finite clause must appear farther away from the verbal stem than the applied indirect object: thus, the argument expressed as the possessor in (78b) may only be interpreted as the external argument, while the incorporated nominal is necessarily assigned the theta-role of the applied object.

(78)   a.   mə pŝaŝe-r(ABS) hač'e-me(IO) Ø-ja-že
             this girl-ABS   guest-PL.OBL 3ABS-3PL.IO+DAT-wait
             'This girl is waiting for the guests.' (Tg)

       b.   marə hač'e-me   ja-pŝeŝe-je-ža-p̣e
             here guest-PL.OBL 3PL.PR+POSS-girl-DAT-wait-NML
             'Here is the place for the guests' waiting for the girl.'
             *'Here is the place for the girls' waiting for the guests.' (Tg)

The derivation for (78b) proceeds in the same fashion as for (73b), as shown in (79): the indirect object is introduced lower than the external argument as the specifier of Appl^0. The external argument, being the highest nominal within the nominalized vP, is free to raise to the higher Spec,PossP for case; the indirect object, on the other hand, remains in situ within ApplP.

(79)

DP=ω₂
 PossP   D
  DP=ω₁   Poss′ |
   hač'emeᵢ Poss   NP   -Ø
              ja-   vP   N
                   tᵢ   v′   -ṗe
                      ApplP   v
                    NP   Appl′ Ø-
                  pŝeŝe VP Appl je- že
                         V   <je->
                        <že>

hač'e+me(**ω₁**)   ja+pŝeŝe+je+že+ṗe(**ω₂**)

The inverse configuration, wherein the applied object raises to Spec,PossP and the external argument remains in situ in *v*P, is impossible for the same reasons as in (76): the external argument acts as an intervener in the movement path of the applied object.

4.3.3 Bivalent inverse predicates with an applicative-absolutive frame

Inverse verbs in Adyghe constitute a small set of predicates, where the more agentive argument is introduced by an applicative prefix and carries oblique case, while the less agentive argument is marked with the absolutive case (Rogava and Keraševa 1966, 98; Smeets 1992, 122-123; Arkadiev et al. 2009, 64–65; Letuchiy 2013, 741-742). One such predicate is *š'əʁʷəpše* 'forget': if used in a finite clause (80a), this verb assigns oblique case to the experiencer argument (here – *č'alem*) and absolutive case to the stimulus (*jənanexer*). Note that the case marker on the experiencer argument is identical to the marker on the ergative participant in (73a), but one can tell that the source of case is different based on the cross-reference morphology on the predicate: the experiencer in (80a) is cross-referenced on the case-assigning predicate via an indirect object marker that is immediately followed by a locative applicative prefix (Ø-š'ə- '3SG.IO-LOC'), while the ergative agent in (73a) is cross-referenced via the ergative prefix *j-*. If this verb is nominalized as in (80b), the stimulus must appear closer to the verbal stem than the experiencer: the nominal which appears as the incorporee and thus closer to the verb than the possessor must be necessarily interpreted as the stimulus, while the possessor that appears farther from the verb is assigned the experiencer theta-role.

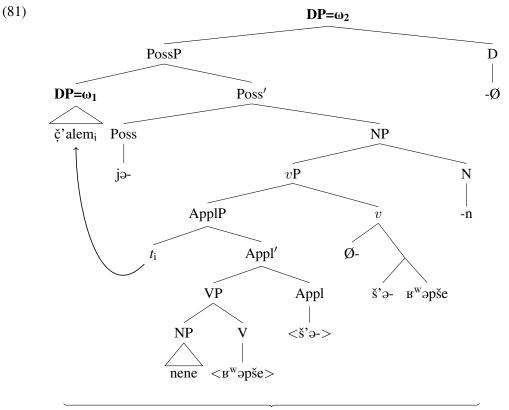(80) a. mə č'ale-m(EXP) Ø-jə-nane-xe-r(STIM)   Ø-Ø-š'ə-ʁʷəpša-ʁe-x
          this boy-OBL   3SG.PR-POSS-grandmother-PL-ABS 3ABS-3SG.IO-LOC-forget-PST-PL
          'This boy forgot his grandmothers.' (Tg)

      b. č'ale-m   Ø-jə-nene-š'ə-ʁʷəpše-n   sə-Ø-š'-e-š'əne
          boy-OBL 3SG.PR-POSS-grandmother-LOC-forget-NML 1SG.ABS-3SG.IO-LOC-DYN-fear

'I am afraid of the boy's forgetting grandmothers.'

*'I am afraid of the grandmothers' forgetting the boy.' (Tg)

The derivation of (80b) is illustrated in (81): I assume that the experiencer argument is merged as a high applicative above VP and below v^0; the theme argument, on the other hand, is introduced as a complement of V^0. This means that the experiencer, being the structurally higher argument, is accessible for raising to Spec,PossP, while the theme must remain in situ as an incorporated nominal.

Based on the facts presented here, we can see that the order of arguments within a nominalized construction maps directly to the order in which these arguments are merged: the internal argument is merged closer to the verbal root than the external argument and thus appears closer to this root in the surface form. This is readily accounted for if we assume that the incorporated nominal is a caseless NP that remains in situ within the nominalized vP.

(81)

č'ale+m(ω_1)   jə+nene+š'ə+ʁ^{w}əpše+n(ω_2)

4.4   Morpheme ordering in nominalizations

In the previous subsections I have argued that nominalizations contain the full vP, including any arguments introduced within that domain. Arguments within the nominalization cannot be assigned absolutive or ergative case in the absence of T^0, but applied objects may be locally assigned case by $Appl^0$. While arguments that are included within the nominalization may be either incorporated or expressed as a possessor regardless of their theta-role, there is a constraint on the order in which these arguments appear: the internal argument must appear closer to the verb than the external argument. This constraint on ordering, coupled with the fact that both the internal and external arguments are introduced within the verbal projection, rather than merged after the nominalizer selects for vP, is best captured if we assume that the incorporated nominals are caseless NPs that remain in situ within the nominalized vP and are pronounced as a single

word with the nominalized verb due to rules of syntax-to-prosody mapping. Noun incorporation in deverbal nominalization is thus epiphenomenal to noun incorporation in nominals generally: it is the result of the same process of matching syntactic constituents with prosodic structures – in this case, the DP phase with the prosodic word.
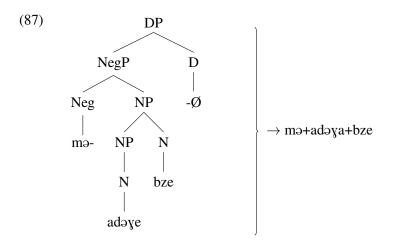
There is, however, an important difference between noun incorporation in verbal nominalizations and the same phenomenon in non-derived nouns. In particular, in the case of non-derived nouns, incorporated lexical material appears immediately adjacent to the incorporating root, while functional affixes appear farther away from the root (82). In nominalizations, on the other hand, while nominal functional prefixes appear to the left of the incorporated nominal, as expected, verbal functional material appears between the incorporated noun and the verbal root (83).

(82) Morpheme order in non-derived nouns:
      PREFIXES – | Incorporee(s) – Root | – SUFFIXES

(83) Morpheme order in nominalizations:
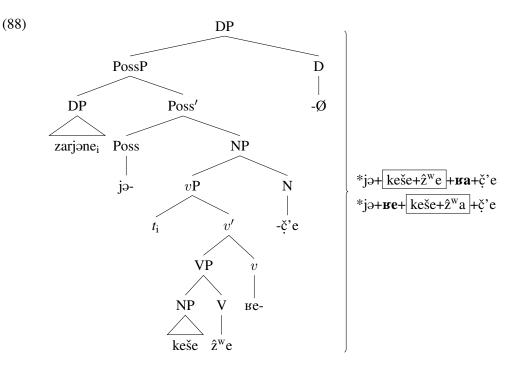   PREFIXES$_{nominal}$ – | Incorporee(s) | – **PREFIXES$_{verbal}$** – | Root | – SUFFIXES

This contrast is shown in the examples below. In (84) the root *adəɣe* 'Adyghe' is incorporated into the nonderived nominal root *bze* 'tongue, language' (surfacing due to the stem-edge phonological alternation as *adəɣabze*). In this case, functional morphology such as the negative prefix *mə-* appears to the left of the incorporated nominal. In (85), on the other hand, the nominal *leʁe* 'dish' is incorporated into the nominalized verbal stem *thač̣'ə* 'wash' – in this case, the same negative prefix *mə-* appears between the incorporated stem and the verbal root. Another example of verbal functional morphology appearing between an incorporated nominal and the nominalized verbal stem is presented in (86): here, the causative prefix *ʁe-* appears between the incorporated nominal *keše* 'porridge' and the verbal root *ẑʷe* 'boil'. Nominal functional prefixes, on the other hand, such as the possessive markers in (85) and (86), appear to the left of the incorporated nominal.

(84) **mə-** | adəɣa- bze |
      NEG- Adyghe- language
      'not Adyghe language'

(85) wjə- | leʁe |- **mə-** | thač̣'ə | -č̣'e
      2SG.POSS- dish- NEG- wash -NML

      'your manner of not washing dishes' (Bz)

(86) zarjəne Ø- jə- | keše |- **ʁe-** | ẑʷa | -č̣'e
      Zarina 3SG.PR- POSS- porridge- CAUS- boil -NML

      'Zarina's manner of porridge-cooking' (Tg)

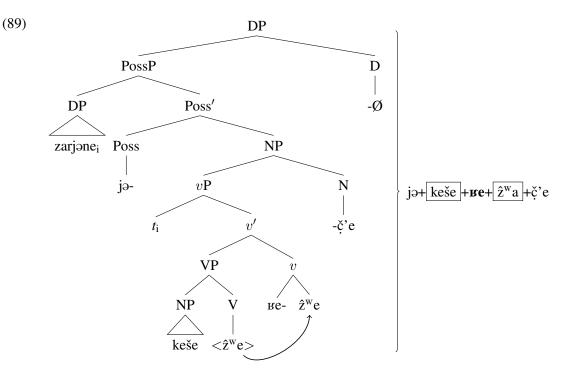Within a DP headed by a non-derived nominal, as in (84), the incorporated nominal is introduced as the complement (or adjunct modifier) of the head nominal, while the negative marker is merged above the NP that includes the incorporated nominal. This structure is then mapped to a single prosodic word in accordance with the MATCH PHASE constraint, resulting in the form presented in (84) – this is illustrated in (87).

(87)

```
                    DP
                  /    \
              NegP      D
             /    \      |
          Neg     NP    -Ø
           |     /   \
          mə-  NP     N
               |      |
               N     bze
               |
             adəɣe
```

→ mə+adəɣa+bze

This simple story, however, cannot be extended to the nominalizations in (85)-(86). In the previous section I have argued that the incorporated arguments of a nominalized predicate remain in situ in their base generated positions. Thus, in both (85) and (86) the incorporated argument remains in its base generated position as the complement of the lexical verb. Such a structure, however, predicts that the incorporated nominal should appear adjacent to the head that introduces it. This prediction is illustrated in (88) for the nominalization in (86): given that the incorporated nominal *keše* 'porridge' remains in situ as the complement of V^0, it is expected to surface adjacent to the verbal root, with the causative prefix (which I assume to be a type of external argument introducing v^0) appearing either to the left or the right of the two lexical roots.
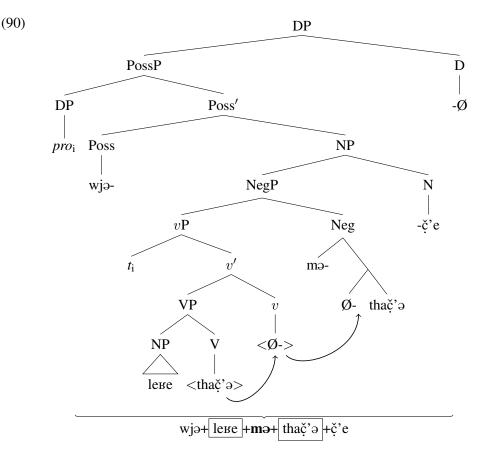
(88)

```
                              DP
                           /      \
                       PossP       D
                      /     \       |
                   DP       Poss'   -Ø
                  /  \      /    \
            zarjəneᵢ Poss        NP
                      |        /    \
                     jə-     vP      N
                            /  \     |
                          tᵢ    v'  -č̣'e
                               /  \
                             VP    v
                            /  \    |
                          NP   V   ʁe-
                         /  \   |
                     keše   ẑʷe
```

*jə+│keše+ẑʷe│+ʁa+č̣'e

*jə+ʁe+│keše+ẑʷa│+č̣'e

As can be seen in (86), this prediction is not borne out: the causative morpheme *ʁe-* surfaces between the incorporated internal argument and the lexical verb that introduces it. The observed morpheme order is however easily derived if we assume that verbal projections are not spelled out in their base generated positions, but instead undergo head movement, as described in section 3.1. This is illustrated in (89): the lexical verb undergoes head movement to v^0, forming the complex head *ʁe+ẑe*. This complex head in turn

appears to the right of the internal argument, which remains in situ as the complement of V^0, thus arriving at the correct morpheme order.

(89)

```
                          DP
                  ┌────────┴────────┐
               PossP                 D
          ┌─────┴─────┐              │
         DP         Poss′            -Ø
          │      ┌────┴─────┐
      zarjəneᵢ  Poss        NP
                 │      ┌────┴────┐
                jə-    vP          N
                   ┌────┴────┐     │
                  tᵢ         v′    -č̣'e
                        ┌────┴────┐
                       VP          v
                   ┌────┴───┐   ┌──┴──┐
                  NP        V  ʁe-  ẑʷe
                   │        │
                 keše    <ẑʷe>
```

jə+ | keše | +ʁe+ | ẑʷa | +č̣'e

The morpheme order we see in (85) is derived in a similar fashion: the internal argument *leʁe* 'dish' remains in situ as the complement of V^0, while the verbal root undergoes head movement to form a complex head with the negative prefix – this structure in shown in (90).

Thus, the unusual morpheme ordering observed in verbal nominalizations, wherein verbal functional morphology appears between the verbal root and the incorporated argument, arises through a combination of two word-formation mechanisms: the incorporated nominal is pronounced as incorporated into the nominalized verb due to phase-to-word mapping rules, while verbal functional morphology forms a complex head with the verbal root via head movement.

(90)

DP tree diagram:

```
                                    DP
                    _____|_____
                  PossP                              D
          _____|_____                          |
        DP              Poss'                        -Ø
        |         _____|_____
       pro_i    Poss              NP
        |      |          _____|_____
       wjə-    |        NegP              N
              |      ____|____            |
            vP              Neg          -č'e
        ____|____        ____|____
       t_i      v'      mə-      |
            ____|____        ____|____
          VP        v      Ø-    thač'ə
        __|__       |
      NP    V    <Ø->
      △     |
    leʁe  <thač'ə>
```

wjə+ | leʁe | +**mə**+ | thač'ə | +č'e

5 Conclusion

The morphosyntactic properties of West Circassian verbal nominalizations provide evidence for the existence of two distinct strategies of word formation in the language: head movement in the verbal domain and phase-to-word mapping in the nominal domain. Such a division of labor is achieved by employing ranked constraints on the mapping from syntax to prosody. The proposed analysis provides a simple explanation for why West Circassian only displays compounding or incorporation of dependent lexical roots in the nominal, and not the verbal, domain: noun incorporation is the prosodic consequence of the DP phase being mapped to a single phonological word, and not a syntactic process. Since this mapping constraint is ranked high only within DP, and not CP, verbal noun incorporation is correctly predicted to be impossible.

The West Circassian data suggests that the morphology of a polysynthetic language need not be derived via a single mechanism: in West Circassian, both head movement and constraints on syntax-to-prosody mapping conspire together to derive the observed complex morphological structures. Note that the proposed analysis does not assume a deep connection between a particular syntactic category and the mechanism of word formation through which a word of that category is expected to be constructed. Thus, the constraints on syntax-to-prosody mapping could be ranked in a way that would derive the mirror image of the West Circassian system, where verbal forms would display prominent incorporation of modifiers and dependents, while nominals would be constructed via head movement and would not not productively incorporate lexical material. If such a system does not in fact exist, this may not be a desired prediction, and a deeper connection must be posited between the availability of productive incorporation and the nominal domain. The fact that English, just like West Circassian, displays much higher freedom of compounding in the nominal domain[23]

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[23]This observation about compounding in English dates as far back as Bloomfield (1933) (see also Marchand 1969, a.o.) and has

suggests this to be a promising trajectory for future inquiry.

In addition to contributing to the discussion of word formation in polysynthetic languages, this paper weighs in on the more general debate regarding the nature of head movement. Restrictions on the order of arguments in nominalized constructions rule out an account within which the nominal arguments vacate the vP, and the vP is then subsequently spelled out as a single prosodic word – an approach that has been proposed for apparent head movement configurations by Koopman and Szabolsci (2000); Müller (2004); Pollock (2006), *inter alia*; see also discussion in Roberts (2011) and references therein.[24] In order to posit such an analysis, one would have to dispense of the Minimal Link Condition to allow the movement of the internal argument past the external argument to a position outside of vP. As a result of this adjustment, the restricted order of arguments in nominalized constructions would remain mysterious. Thus, the West Circassian data lends itself to a theory that treats head movement as a distinct operation, either syntactic (Koopman, 1984; Baker, 1988) or post-syntactic, as suggested e.g. by Boeckx and Stjepanović (2001).

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received much attention in the literature; see Selkirk (1982, 28-29); Lieber (1983); Ackema and Neeleman (2004, 54-66); Harley (2009, 140-142), *inter alia*.

[24]See also Pensalfini (2004) for an evacuation-based account of polysynthetic word formation.

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