Ossetic verb morphology in L$_R$FG

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Overview   I propose an analysis of Iron Ossetic verbal inflection in terms of L$_R$FG (Melchin, Asudeh, and Siddiqi 2020; Everdell et al. 2021; Asudeh and Siddiqi 2022). I show that the intergration of morphology and syntax embraced by this framework allows for a rather parsimonious account in which verbs have at most two stems defined in the vocabulary, even though, on the level of description, some seem to require two. The analysis also captures the asymmetries between so-called morphologically transitive and intransitive verbs in the past-stem series, and the identity of past stems and participles.

Ossetic verb morphology   Like other modern Iranian languages, Ossetic verbs are a closed class of around 200 lexemes, each of which has two stems, present and past. The past stem is formed from the present by the addition of one of the suffixes *-d/t*, *-št*, or *-əd*. The choice of the suffix is unpredictable from the form of the present stem and often cooccurs with (likewise unpredictable) vowel/glide alternations in the stem, cf. e.g. *taw-* / *tad-* 'melt' but *xaw-* / *xawd-* 'fall'.

Ossetic has several sets of personal endings, which are distinguished for tense-mood features; each of these ending sets can attach to only one stem. Stems in Ossetic are morphomic and cannot be assigned any specific tense or mood features. The past stem is generally identical to the form of the past participle (which also serves as a verbal noun), but a few verbs distinguish between the past stem and the participle form – for example, *χʷəšš-* 'sleep', whose past stem is *χʷəššəd-* and the participle *χʷəšt* 'the sleep'. The past stem is used with the past tense and the counterfactual; other tenses and moods are based on the present stem.

Ossetic verbs also mark transitivity in the past-stem forms. This morphological transitivity[1] does not always correlate with syntactic transitivity and should be treated as an inflection class rather than a reflection of syntactic features (see Vydrin 2022 for a detailed overview). Transitivity is reflected only in the past tense by a distinction between two sets of endings. Transitive verbs additionally have *-t-* inserted between the stem and the ending; in the counterfactual, it is the only feature that distinguishes transitivity. The suffix *-t-* is not always visible: it disappears after C*t/d* clusters (where C is an obstruent), but its presence is sometimes noticeable in the devoicing of the final cluster, as in the labile verb *šuz-* / intr. *šəʁd-* / tr. *šəχt-* 'burn'.

Illustrations of the intransitive and transitive conjugations are provided in (1) and (2), respectively.

Analysis   The analysis is based on the observation that three-stem verbs in fact form a rather special class. Namely, they are all intransitive and use the past stem suffix *-əd*; the participle is formed using *-d/t* or *-št*. The suffix *-əd* is special in that, unlike the other two markers, it is never associated with any vocalic or consonantal alternations in the stem.

Therefore, for **transitive** verbs, the past stem is *always* the participle, and for intransitive verbs, it is *sometimes* the case. We propose to take this fact for granted and assume that the "past stem" of transitive verbs *is*, in fact, the participle. In terms of L$_R$FG, then, the "present stem" spans the heads √+v (verbs in Ossetic are never acategorial), while the transitive "past stem" spans √+v+n. Agreement/tense-mood suffixes attach to the v head; the structure of present-stem forms is thus trivial (3). But when the transitive past stem is used, there must be an additional n head that converts the participle back into a verb. This role is filled by the suffix *-t-*, which I analyze as occupying the v head (4).

This can be achieved by the VIs for the verb stems in (5) and for the inflectional affixes in (6). Transitivity is modeled using the feature CLASS; to control for morphomic stem choice, I introduce a similar feature STEM in the v-structure. There is no suffix in the lexicon that can convert the present stem to the past stem for transitive verbs; therefore, past-stem forms have to be based on the participle, which must be converted to a verb using the suffix *-t* (7).

The structure of **intransitive** verbs is different. They can make use of the suffix *-əd* that, I assume, attaches in specifier position of vP and converts the present stem to the past stem. This suffix is blocked for "two-stem" verbs, because these have two VIs in the lexicon: one for the present stem (which has the same features as the transitive present stem in 5a) and one for the (verbal) past stem (8), that spans √+v+Pst; **MostInformative$_c$** ensures the structure in (9) and blocks forms such as **səw-əd-aid* (go-ST.PST-CNTRF.3SG). The past stem *səd-* also functions as a participle due to Pac-Man spanning: the stem fills the n node because there is no suitable VI to realize its features.

The VIs for "three-stem" intransitive verbs is largely identical to that of transitive verbs: they define the present stem and the participle (11). But, unlike transitive verbs, there is no need to "verbalize" the participle, because a simpler structure is available that uses the regular suffix *-əd* (12), as in (10).

Conclusions   This analysis demonstrates that L$_R$FG can be successfully used to model a system that includes morphomic stems and inflection classes. In the talk, we will present the analysis in more detail and consider some problems for the analysis, in particular, the validity of suffixes that do not realize any f-structure or semantics; the difference in consonant alternations between transitive *-t-* and the initial *t* of the intransitive conjugation; and the failure of the participle *xʷəšt* to span to v in intransitive past-stem forms (**xʷəšt-i*).

Asudeh, A., and D. Siddiqi. 2022. "Realizational Morphosemantics in LrFG." In *Proceedings of the LFG '22 Conference,* ed. by M. Butt, J. Y. Findlay, and I. Toivonen, 21–40. Konstanz. **Everdell, M., P. B. Melchin, A. Asudeh, and D. Siddiqi**. 2021. "Beyond c-structure and f-structure: On the argument-adjunct distinction in O'dam." In *Proceedings of the LFG21 Conference,* ed. by M. Butt, J. Y. Findlay, and I. Toivonen, 125–145. Stanford, CA. **Melchin, P. B., A. Asudeh, and D. Siddiqi**. 2020. "Ojibwe agreement in Lexical-Realizational Functional Grammar." In *Proceedings of the LFG'20 Conference,* ed.

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1. In this paper, we will use the terms *transitivity, (in)transitive* to refer to inflection classes, unless otherwise noted.

by M. Butt and I. Toivonen, 268–288. S. **Vydrin, A. P.** 2022. "Perexodnost' v osetinskom jazyke" [Transitivity in Ossetic]. *Acta Linguistica Petropolitana* 18 (3): 11–30.

Examples

(1) inflection of the intransitive verb χ^wəšš- / χ^wəšš-əd- / χ^wəšt 'sleep'

	present		preterite		counterfactual	
	sg.	**pl.**	**sg.**	**pl.**	**sg.**	**pl.**
1	χ^wəšš-ən	χ^wəšš-ɜm	χ^wəšš-əd-tɜn	χ^wəšš-əd-əštɜm	χ^wəšš-əd-ain	χ^wəšš-əd-aikkam
2	χ^wəšš-əš	χ^wəšš-ut	χ^wəšš-əd-tɜ	χ^wəšš-əd-əštut	χ^wəšš-əd-aiš	χ^wəšš-əd-aikkat
3	χ^wəšš-ə	χ^wəšš-əns	χ^wəšš-əd(-i(š))	χ^wəšš-əd-əštə	χ^wəšš-əd-aid	χ^wəšš-əd-aikkoj

participle: χ^wəšt

(2) inflection of the transitive verb *šur-* / *šərd* 'chase'

	present		preterite		counterfactual	
	sg.	**pl.**	**sg.**	**pl.**	**sg.**	**pl.**
1	šur-ən	šur-ɜm	šərd-t-on	šərd-t-am	šərd-t-ain	šərd-t-aikkam
2	šur-əš	šur-ut	šərd-t-aj	šərd-t-at	šərd-t-aiš	šərd-t-aikkat
3	šur-ə	šur-əns	šərd-t-a	šərd-t-oj	šərd-t-aid	šərd-t-aikkoj

participle: šərd

(3) structure of present-stem forms (present, verb *šur-* / *šərd* 'chase', tr.)
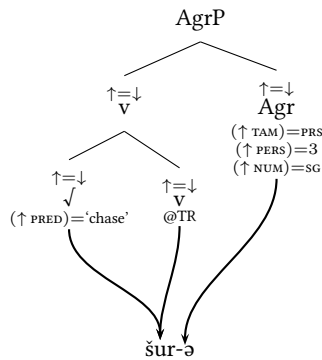
(4) structure of transitive past-stem forms (counterfactual, verb *šur-* / *šərd* 'chase')
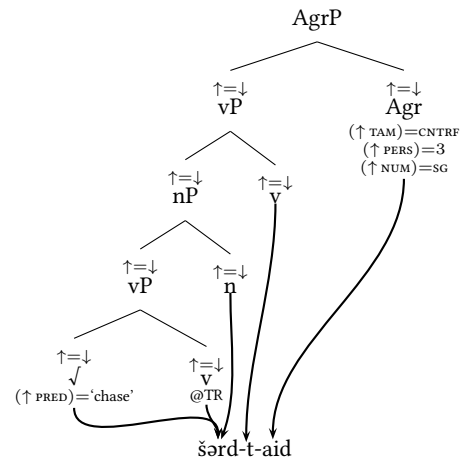
(5) a. present (transitive verb): $< [\sqrt{}, \text{v}], \Phi \left\{ \begin{array}{c} (\uparrow \text{PRED}) = \text{'chase'} \\ @\text{TR} \end{array} \right\}, \_ > \overset{\nu}{\rightarrow} \begin{bmatrix} \text{PHON.REP} & /\text{šur}/ \\ \text{CLASS} & \text{TR} \\ \text{STEM} & \text{PRS} \\ \text{TYPE} & \text{VERBAL} \end{bmatrix}$

b. participle (transitive verb): $< [\sqrt{}, \text{v}, \text{n}], \Phi \left\{ \begin{array}{c} (\uparrow \text{PRED}) = \text{'chase'} \\ @\text{TR} \end{array} \right\}, \_ > \overset{\nu}{\rightarrow} \begin{bmatrix} \text{PHON.REP} & /\text{šərd}/ \\ \text{CLASS} & \text{TR} \\ \text{STEM} & \text{PST} \\ \text{TYPE} & \text{NOMINAL} \end{bmatrix}$

(6) a. counterfactual $< [\text{Agr}], \Phi \left\{ \begin{array}{c} (\uparrow \text{TAM}) = \text{CNTRF} \\ (\uparrow \text{PERS}) = 3 \\ (\uparrow \text{NUM}) = \text{SG} \end{array} \right\}, \_ > \overset{\nu}{\rightarrow} \begin{bmatrix} \text{PHON.REP} & /\text{aid}/ \\ \text{DEP} & \text{LT} \\ \text{STEM} & \text{PST} \\ \text{TYPE} & \text{VERBAL} \\ \text{HOST} & \begin{bmatrix} \text{IDENT} & \text{NIECE} \\ \text{TYPE} & \text{VERBAL} \\ \text{STEM} & \text{PST} \end{bmatrix} \end{bmatrix}$

b. past intransitive $< [\text{Agr}], \Phi \left\{ \begin{array}{l} (\uparrow \text{TAM}) = \text{PST} \\ (\uparrow \text{PERS}) = 3 \\ (\uparrow \text{NUM}) = \text{SG} \end{array} \right\}, \_ > \xrightarrow{\nu}$

$$\begin{bmatrix} \text{PHON.REP} & /iš/ \\ \text{DEP} & \text{LT} \\ \text{CLASS} & \text{INTR} \\ \text{STEM} & \text{PST} \\ \text{TYPE} & \text{VERBAL} \\ \text{HOST} & \begin{bmatrix} \text{IDENT} & \text{NIECE} \\ \text{TYPE} & \text{VERBAL} \\ \text{STEM} & \text{PST} \\ \text{CLASS} & \text{INTR} \end{bmatrix} \end{bmatrix}$$

c. past transitive $< [\text{Agr}], \Phi \left\{ \begin{array}{l} (\uparrow \text{TAM}) = \text{CNTRF} \\ (\uparrow \text{PERS}) = 3 \\ (\uparrow \text{NUM}) = \text{SG} \end{array} \right\}, \_ > \xrightarrow{\nu}$

$$\begin{bmatrix} \text{PHON.REP} & /a/ \\ \text{DEP} & \text{LT} \\ \text{CLASS} & \text{TR} \\ \text{STEM} & \text{PST} \\ \text{TYPE} & \text{VERBAL} \\ \text{HOST} & \begin{bmatrix} \text{IDENT} & \text{NIECE} \\ \text{TYPE} & \text{VERBAL} \\ \text{STEM} & \text{PST} \\ \text{CLASS} & \text{TR} \end{bmatrix} \end{bmatrix}$$

(7) transitive suffix: $< [\text{v}], \Phi, \_ > \xrightarrow{\nu}$

$$\begin{bmatrix} \text{PHON.REP} & /t/ \\ \text{DEP} & \text{LT} \\ \text{CLASS} & \text{TR} \\ \text{STEM} & \text{PST} \\ \text{TYPE} & \text{VERBAL} \\ \text{HOST} & \begin{bmatrix} \text{IDENT} & \text{NIECE} \\ \text{TYPE} & \text{NOMINAL} \\ \text{CLASS} & \text{TR} \\ \text{STEM} & \text{PST} \end{bmatrix} \end{bmatrix}$$

(8) past stem for 2-stem intransitive verb $< [\sqrt{}, \text{v}, \text{Pst}], \Phi \left\{ \begin{array}{l} (\uparrow \text{PRED}) = \text{'go'} \\ @\text{INTR} \end{array} \right\}, \_ > \xrightarrow{\nu}$

$$\begin{bmatrix} \text{PHON.REP} & /səd/ \\ \text{CLASS} & \text{INTR} \\ \text{STEM} & \text{PST} \\ \text{TYPE} & \text{VERBAL} \end{bmatrix}$$

(9) past tense form of "two-stem" verb *sɜw-* / *səd-* 'go'
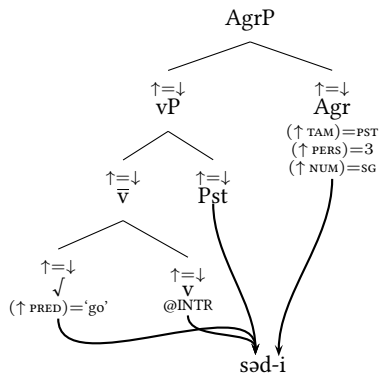
(10) past tense form of "three-stem" verb *xʷəšš-* / *xʷəšš-əd-* / *xʷəšt* 'go'
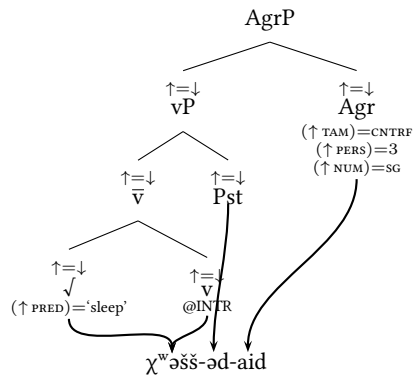
(11) participle for "3-stem" intransitive verb $< [\sqrt{}, \text{v}, \text{Pst}, \text{n}], \Phi \left\{ \begin{array}{l} (\uparrow \text{PRED}) = \text{'sleep'} \\ @\text{INTR} \end{array} \right\}, \_ > \xrightarrow{\nu}$

$$\begin{bmatrix} \text{PHON.REP} & /\chi^w \text{əšt}/ \\ \text{CLASS} & \text{TR} \\ \text{STEM} & \text{PST} \\ \text{TYPE} & \text{VERBAL} \end{bmatrix}$$

(12) intransitive past stem marker $< [\text{Pst}], \Phi, \_ > \xrightarrow{\nu}$

$$\begin{bmatrix} \text{PHON.REP} & /əd/ \\ \text{DEP} & \text{LT} \\ \text{CLASS} & \text{INTR} \\ \text{STEM} & \text{PST} \\ \text{TYPE} & \text{VERBAL} \\ \text{HOST} & \begin{bmatrix} \text{IDENT} & \text{NIECE} \\ \text{TYPE} & \text{VERBAL} \\ \text{CLASS} & \text{INTR} \\ \text{STEM} & \text{PRS} \end{bmatrix} \end{bmatrix}$$