

Towards a DM account of verbal morphophonology in Udmurt

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- Goal of this talk: to derive the **stress properties** of verbs in Udmurt from their **morphosyntactic structure**, within the **Distributed Morphology** framework (DM; Halle & Marantz 1993)
- DM approaches to stress placement:
 - stress placement derives from the positioning of **category-defining heads** like v^0 , n^0 , and a^0 (Embick 2010; Marvin 2013).
 - **non-cyclic functional heads** may determine stress placement (Oltra-Massuet & Arregi 2005 on Spanish).

- Our analysis of stress distribution in different kinds of verbs in Udmurt (indicative, imperative, negated) supports the latter approach: in Udmurt, a **non-cyclic functional head, T^0** , determines stress placement.
- We rely on the instrumental evidence that comes from Borise & Georgieva (2021) and adopt and elaborate upon the existing syntactic analysis of negated verbs in Udmurt (Georgieva et al. 2021).

Outline

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Background

Word stress in Udmurt

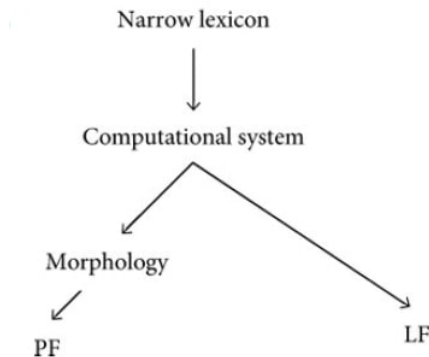
- Udmurt (Uralic, Permic) is described as having fixed **final** stress (Yemelyanov 1927; GSUJa I 1962; Denisov 1980; Winkler 2001)
 - indicative verbs: *valá* ‘understand.PRS.3SG’
- Morphologically conditioned exceptions with **initial** stress:
 - imperative verbs: *vála* ‘understand.IMP.2SG’
 - negated verbs: *uz vála* ‘NEG.FUT.3SG understand’
 - (reduplicated adjectives, etc.)

- Our instrumental study (Borise & Georgieva 2021): Udmurt has initial and final metrical stress.
 - as opposed to, e.g., the final, default stress being a non-metrical phrase-edge effect; cf. Jun & Fougeron (1995) for French.
- These conclusions are based on acoustic evidence like vowel quality and alignment with pitch accents.

Distributed Morphology: background

- A “**syntax-all-the-way-down**” approach to morphological structure building
- Organisation of grammar: **morphology is postsyntactic**

(1) DM architecture



Distributed Morphology: background (cont.)

- DM set of **morphological operations**: Lowering, Fusion, Fission, Impoverishment, etc.
These operations modify the output of syntax.
- **Late Insertion Hypothesis**: morphology operates with abstract morphosyntactic features; the phonological content of abstract morphemes is inserted postsyntactically at PF, Vocabulary Insertion (VI).

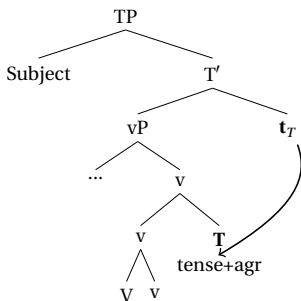
Verbal morphosyntax in Udmurt

- Georgieva et al.'s (2021) analysis: functional heads like T and Neg in Udmurt undergo **Lowering** (Embick & Noyer 2001) to form a complex head with the verb.
- Lowering displaces a head to the head of its complement; operates on hierarchical structures, i.e., before Vocabulary Insertion.
- This analysis is supported by:
 - the order of morphemes within the complex head
 - adjacency between Neg and V
 - word order facts

Verbal morphosyntax in Udmurt (cont.)

In non-negative contexts, T (T+Agr) undergoes Lowering to and is linearized to the **right** of v, as in (2):

(2) Indicative verbs

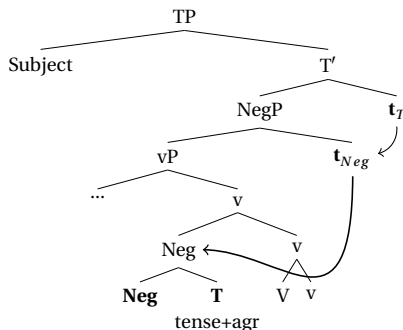


→ **Linearization:** V-v-T+Agr

Verbal morphosyntax in Udmurt (cont.)

In negative contexts, Neg is picked up by T (T+Agr) under Lowering and the resulting complex head is linearized to the **left** of v, as in (3):

(3) Negated verbs



→ **Linearization:** Neg-T+Agr-V-v

Stress placement in DM

Existing DM analyses of stress placement

- In Distributed Morphology, lexical categories are assumed to consist of an **acategorial root** and a **category-defining head/categorizer**:

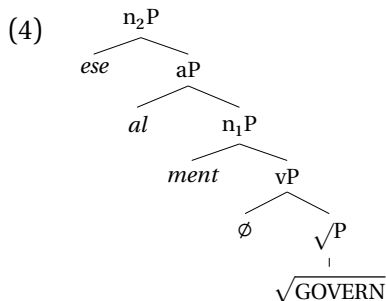
$$\rightarrow \sqrt{\text{ROOT}} + v^0 = V$$

- Categorizers are **cyclic**: they trigger Spell-Out, while other heads (e.g., T^0) do not (Embick 2010).
- ↪ When a categorizing head is merged, the cyclic domains in its complement are sent to the interfaces.

Approach 1: cyclic X^0 s determine stress placement

Marvin's (2013) account of English stress placement:

If a word contains **several categorizing heads**, Spell-Out is triggered for **each** phrase.



The Main Stress Rule of English (Halle 1998) applies at: vP , aP , n_2P , and at the next higher phrase.

Stress assigned within previous Spell-Outs is **preserved** (as secondary stress).

→ *góvernmentalése*

Approach 2: non-cyclic X^0 s may, too

Oltra-Massuet & Arregi (2005): stress assignment in Spanish verbs is determined by the position of **T** – stress targets the vowel immediately (linearly) preceding the T node:

- T is preceded by a right bracket that closes the metrical foot to the left of T:

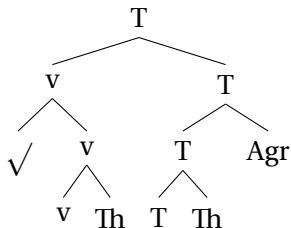
... x) T

- stress is assigned to the rightmost vowel of the foot:

... \acute{x}) T

Approach 2: non-cyclic X⁰s may, too

(5) Spanish verbs



- (6) a. [_✓ [v Th]] [[T Th] Agr] b. [_✓ [v Th]] [[T Th] Agr]
cant ∅ á b a mos tem ∅ í ∅ a mos
'we sang' (1st conjugation) 'we feared' (2nd conjugation)

Approach 1 & Approach 2

- Both approaches tie stress assignment to morphosyntactic structure, but crucially differ with respect to which syntactic heads determine the domains for stress assignment:
 - cyclic heads, i.e., categorizers (Embick 2010; Marvin 2013)
 - certain non-cyclic heads (Oltra-Massuet & Arregi 2005)

We show that the Udmurt stress facts cannot be derived based on the distribution of cyclic heads and **make reference to non-cyclic functional heads** instead.

Proposal

- In line with Oltra-Massuet & Arregi (2005), the main tenet of our analysis is that **T, the highest functional head in the verbal spine (=HFX⁰)**, plays the crucial role in stress assignment.
- The Udmurt T differs from its Spanish counterpart, though: it can be linearized **to the right or to the left of v**, cf. (2)–(3).

(7) **Stress assignment algorithm for Udmurt:**

- a. Insert a **left bracket** to the right of the HFX^0 (i.e., T in verbs), indicating the left edge of the metrical foot:

T (x ...

- b. Align stress with the **left edge** of the foot:

T (́x ...

- c. If no stress-bearing material is available to the right of the HFX^0 , move the left bracket **one step to the left**, then align stress with the left edge of the foot.

(T ...

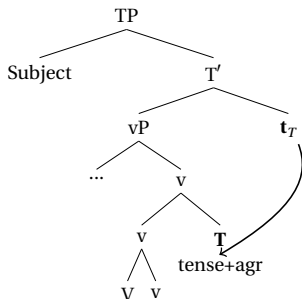
Further assumptions

- We assume that the Stress Placement Algorithm applies to the exponents of morphemes.
- It is sensitive to what the actual exponents of Neg, T, and agreement are.
- Thus, the ordering at PF is as follows:
(8) Lowering > Vocabulary Insertion > Stress assignment

Indicative verbs

- T is linearized to the right of v after Lowering, as was shown in (2), repeated as (9):

(9) Indicative verbs



→ **Linearization:** V-v-T+Agr

↪ The left bracket is inserted to the right of T: **T (x ...**

Depending on the actual exponents of Tense and Agreement, three cases are to be distinguished:

- ① In verbs that contain overt material to the right of T, i.e., overt Agr morphology, default stress placement, (7b), applies and stress is realized on that morpheme:

(10) vetl-o-zǐ
go-FUT-3PL
'they will go'

[Exponents: V+T+**Agr**]

NB: But see Implications for discussion of dialectal variation

Indicative verbs (cont.)

② Leftward movement of the bracket, (7c), applies in two cases:

- ① in verbs that contain an overt exponent of T but no overt / syllabic material to the right of T:

- (11) a. vetl-**í** b. vetl-**í**-z
 go-PST[1SG] go-PST-3SG
 'I went' 's/he went' [Exponents: V+**T**+Agr]

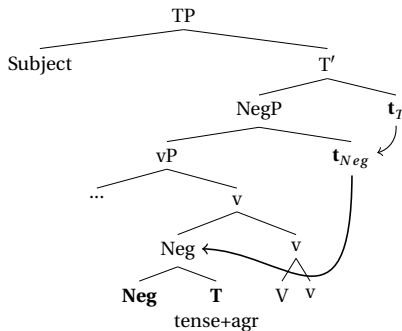
- ② in verbs that contain no overt exponent of T or Agr:

- (12) ver**á**
 'say.PRS.3SG'
 's/he says' [Exponents: **V**+**T**+Agr]

Negated verbs

- For negated verbs, we adopt the structure in (3), repeated as (13).
- Neg and T undergo Lowering to v, and due to the special linearization requirement of Neg are ordered to the left of v:

(13) Negated verbs



→ **Linearization:** Neg-T+Agr-V-v

Negated verbs

- The linearized structure of negated verbs is as follows: Neg-T+Agr-V-v.
- Negation and Tense are exponed by a single morpheme: /i/ in the past tense, /u/ in the non-past; the exponent of Agr is not syllabic.
- The left bracket is inserted to the right of T: **T** (ʒ ...
- Stress is correctly placed on the syllable following T, i.e., the first syllable of the verb as per (7b):

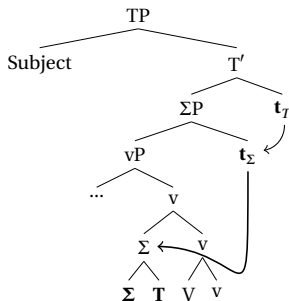
(14) u-z véra
 NEG.FUT-3 say.CN.SG
 ‘s/he will not say’

[Exponents: Neg.**T**+Agr **V**]

Imperative verbs

- We propose that imperative verbs have the structure in (15).
- The (phonologically zero) Σ head (cf. Laka 1994) also undergoes Lowering with T, in a parallel fashion to Neg in (3), yielding Σ -T-V-v.

(15) Imperative verbs



→ **Linearization:** Σ -T-V-v

Imperative verbs

- The Σ and T have no overt exponent.
- The left bracket to the right of T places the left edge of the metrical foot:
T (x ...
- Stress is placed on the syllable following T, i.e., the first syllable of the verb:

(16) véra
say.IMP.2SG
'say!'

[Exponents: Σ +T **V**]

Implications

Our proposal makes correct predictions for stress assignment in verb clusters containing **clitics**.

- Aspectual (en)clitics *ni* ‘already, anymore’ and *na* ‘still, yet’ encliticize to the verb, yielding **V-cl**.
- In the context of negation, these clitics attach either to the lexical verb or to negation, giving rise to **Neg-V-cl** or **Neg-cl-V** (Arkhangelskiy 2014).

Georgieva et al. (2021) propose that these clitics are **phrase-structurally ambiguous**, i.e., they can be either heads or phrases:

- If a clitic is a **head**, it undergoes Lowering and thus becomes part of the complex head linearized as Neg-T+Agr-cl-V-v.
→ word order: **Neg-cl-V**
- If a clitic is a **phrase**, it is skipped by Lowering, and simply ‘leans onto’ the complex head, as an enclitic, without being part of it.
→ word orders: **Neg-V-cl**

Implications: clitics

Our analysis predicts that stress will target the **clitic** in **Neg-cl-V** word orders.

- Here, the clitic is part of the complex head Neg-T+Agr-cl-V-v and the right-most element in the foot:

T (cl ...

- This prediction is borne out (based on speaker intuitions):

(17) e-z ná valale
 NEG.PST-3 CL say.CN.PL
 ‘they haven’t understood yet’

Implications: clitics

In **Neg-V-cl** and **V-cl** orders, clitics are not part of the complex head: they lean onto/encliticize to it.

- Accordingly, we predict that the presence of clitics will not affect expected stress placement in indicatives and negated verbs.
- These predictions, too, are borne out (based on speaker intuitions):

(18) e-z v^álale na
 NEG.PST-3 say.CN.PL CL
 ‘they haven’t understood yet’

(19) valal^ó ní
 say.PRS.3PL CL
 ‘they already understand’

Implications: dialectal variation

- Some Northern and Southern dialects of Udmurt display a different stress placement pattern in indicative verbs (Kelmakov 1998; Karpova 2005; Teplyashina 1970), as (syllabic) Agr morphology is not stressed.

- (20) a. vetl-o-z_ǐ
go-FUT-3PL
'they will go' [Standard Udmurt]
- b. vetl-**ǫ**-z_ǐ
go-FUT-3PL
'they will go' [Northern/Southern dialects]

- We tentatively propose that the stress in (20b) can be derived by the leftward movement of the bracket (7c) – on the additional assumption that Agr markers are clitics in these dialects (cf. Georgieva 2017)

A parallel with Turkish

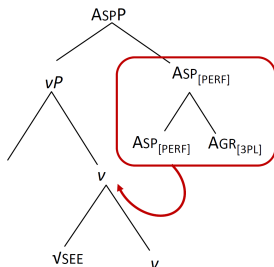
- There are two sets of agreement markers in Modern Standard Turkish: the so-called *z*-paradigm and the so-called *k*-paradigm
- The suffixes belonging to the *z*-paradigm have been analysed as clitics, as they are not stressed, that attach to a present tense copula (see Kornfilt 1996; also Kelepir 2001), as shown in (21a). The suffixes belonging to the *k*-paradigm do bear stress (if they are syllabic), this giving rise to final stress in verbs, as in (21b).

- (21) a. git-m^ış-Ø-siniz
come-PERF-COP-2PL
'you have come (reportedly)' [z-paradigm]
- b. gi-ti-n^ız
come-PST-2PL
'you have come' [k-paradigm]

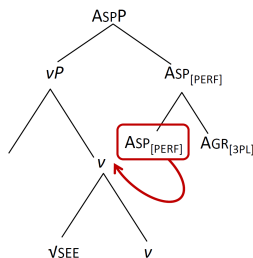
Turkish verbs: a partial Lowering account

Alternatively, the variability in stress placement in Turkish verbs depends on whether a full complex head or its part undergoes Lowering.

- (22) a. gör-müş-**lér**-i-di
see-PERF-3PL-COP-PST
'they have seen'



- b. gör-**müş**-ler-i-di
see-PERF-3PL-COP-PST
'they have seen'



(Güneş 2021, 2022)

Conclusion

Conclusion

- The **stress properties** of verbs in Udmurt can be successfully derived from their **morphosyntactic structure**, within the **Distributed Morphology** framework.
- In Udmurt, a **non-cyclic head, T**, determines stress placement.
- Our analysis provides evidence in favour of an approach that allows for **non-cyclic heads** to determine stress placement (Oltra-Massuet & Arregi 2005 on Spanish).
- Our analysis makes correct predictions for stress placement in contexts that contain **clitics**, and can account for **dialectal variation** in stress placement in Udmurt.

Thank you for your attention!

We are deeply indebted to the Udmurt native speakers who participated in the experiment: Yulia Speshilova, Elena Rodionova, Valeria Fedorova, Anna Kadrova, Lukeria Shikhova, Vladislav Volkov and one anonymous participant as well as to Ekaterina Suntsova. We also thank the research assistants who annotated the recordings: Bernadett Dam, Péter Hatvani and Gergő Turi.

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