

Three ways of unifying participles and nominalizations: the case of Udmurt*

Éva Dékány & Ekaterina Georgieva

Research Institute for Linguistics, Hungarian Academy of Sciences

January 2020

1 Introduction

Chomsky's (1970) *Remarks on nominalizations* deals with the syntax of different types of nominalizations in English, placing the theoretical focus on how syntax and the lexicon interact. In this paper we discuss the so-called participle-nominalization polysemy, that is, cases in which the suffix involved in (deverbal) nominalizations is form-identical to the suffix employed in non-finite (typically prenominal) participial relative clauses (henceforth 'relatives' or RCs). This scenario is schematized in (1) (with the nominalization of (1a) occupying the object position).

- | | | | |
|-----|----|---|------------------|
| (1) | a. | [<i>VP</i> [<i>nominalization</i> V-sfx] matrix-V] | [nominalization] |
| | b. | [<i>DP</i> [<i>relative</i> V-sfx] N] | [relative] |

A shared suffix between (participial) relatives and nominalizations is cross-linguistically widespread, for instance, it is frequently observed in Uralic and Altaic languages (Koptjevskaja-Tamm 1993:2.2.5, Serdobolskaya & Paperno 2006; Shagal 2018) as well as in the Quechua family (Koptjevskaja-Tamm 1993:2.2.5) and in Tibeto-Burman languages (Noonan 1997).¹ (2) provides a specific illustration from Udmurt (Permian, Uralic), where the suffix *-m* appears in deverbal nouns with a complex internal structure (2a) as well as in (participial) relative clauses (2b).

- | | | | |
|-----|----|--|-------------------|
| (2) | a. | [Pinal-jos-len Līmī Tēd'ī-jez kīrdža-m-zī] mīnīm jaraz. | |
| | | child-PL-GEN Snow White-ACC sing-m-POSS:3PL 1SG.DAT appeal.PST.3SG | |
| | | 'I liked that/how the children sang the song "Snow is White".' | [deverbal noun] |
| | b. | [Kīl'em ar-jn pukt-em] korka džuaz. | |
| | | last year-INE build-m house burn.PST.3SG | |
| | | 'The house that was built last year has burned down.' | [relative clause] |

*Our names appear in alphabetical order. We wish to thank our informants for being generous with their time and making this research possible. This material is based upon work supported by grants NKFIH KKP 129921, NKFIH 125206 and PPD-011/2017, which is gratefully acknowledged. The glossing/transcription of examples from other sources was slightly modified for consistency. The abbreviations not included in the Leipzig Glossing Rules are the following: ADD: additive (particle), CN: connegative (stem), EVID: evidential (past), FREQ: frequentative, IDEO: ideophone, ILL: illative (case), INE: inessive (case).

¹This pattern is also attested in more familiar languages, e.g. English: *the reading director* vs. *the director's reading (of) the book*.

The fact that the same morpheme appears in both deverbal nouns and participial RCs with relative systematicity in different language families makes it unlikely that we are dealing with unconnected cases of accidental homophony in the lexicon. Instead, a principled syntactic account is called for.

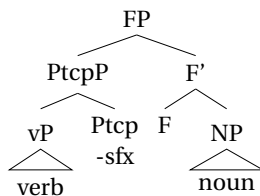
The aim of this paper is to lay out the hypothesis space for an explanatory account of the cross-linguistic participle-nominalizer polysemy, and to discuss which of the hypotheses is best suited to capture the Udmurt facts in particular. The discussion will proceed as follows. Section 2 lays out three different ways in which the polysemy can be given a unified syntactic account, such that the same lexical entry underlies the shared suffix of relatives and deverbal nouns. Section 3 proceeds to the empirical focus of the paper, detailing the morpho-syntactic properties of Udmurt relatives and deverbal nouns with *-m*. In Section 4 we argue against treating *-m* as a nominalizing head, and in section 5 we develop an account of *-m* as a head in the extended verbal projection. Section 6 closes the paper.

2 Principled approaches to the polysemy

Under a unified analysis for a suffix appearing in both (participial) relatives and nominalizations, the null hypothesis is that the suffix spells out either a functional head in the extended VP or a nominalizing head which requires an extended VP as its complement. In the former case the head expounded by the suffix is inherently verby (taking care of the relative use without further ado and requiring something additional to be said about nominalizations), while in the latter case it is inherently nouny (which delivers the nominalized cases and requires further explanation of the relative use). Below we will explore both options.

If the morpheme under consideration expounds a verbal head, then the participial RC use can be represented as in (3), where Ptcp is a head within the extended VP and FP is a projection in the extended NP.²

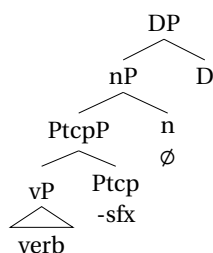
(3) Relative



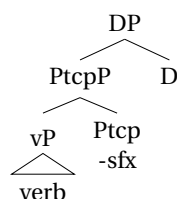
Nominalizations can then be analyzed in two different ways. Firstly, they might involve a nominal layer topping off the extended VP, yielding a mixed extended projection (cf. Borer 1997, 2013; Borsley & Kornfilt 2000; Fu et al. 2001; Alexiadou 2001, 2013, Alexiadou this volume; Alexiadou et al. 2011, 2010, 2013; Kornfilt & Whitman 2011a; Baker 2011, among many others). This scenario could involve a phonologically zero head specialized for nominalization (a DM-style categorizer, which we are going to call *n*) (4), or the extended VP could be embedded directly under a nominal functional head, e.g. Num or D, without the mediation of a nominalizer proper (5). In either case, the topmost nominal projection takes care of the external nominal distribution of the phrase.

²In our trees Ptcp should be understood as an independently motivated verbal functional head. The identity of this head (e.g. Asp, T, etc.) is not of immediate concern to us and therefore we do not discuss it here. What is important is that it is a head with verbal characteristics, as in Baker (2011) and Collins (2005). Importantly, it is not equivalent to Ptcp in Doron & Reintges (2005), where this label designates a head with nominal properties.

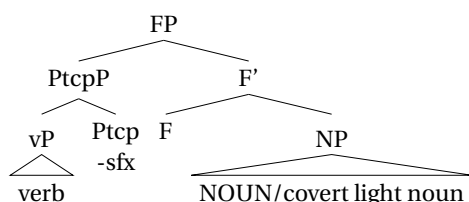
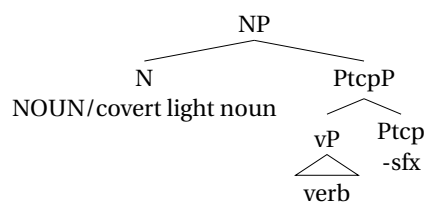
(4) 'direct' nominalization



(5) 'indirect' nominalization



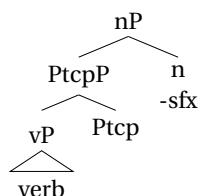
Secondly, the nominalization cases could involve a PtcpP modifying a covert noun, either in a relative-clause configuration (6) or in a complement configuration (7). (On the latter possibility, see also Moulton this volume.) The covert noun could be a lexical noun or a type of light noun. In either case, this is the head of the whole constituent, which means that the phrase under consideration has a nominal external distribution.

(6) 'nominalization'
(underlying RC syntax)(7) 'nominalization'
(underlying complement syntax)

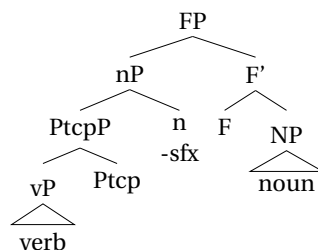
In this case what we have called the 'nominalized' cases do not involve any nominalization, in fact: they have exactly the same underlying structure as relative or complement clauses, except they have a covert N head.

Let us now turn to the possibility that the suffix shared by relatives and nominalizations spells out a nominalizing head. The nominalizations can then be treated as mixed projections, with the suffix taking an extended VP complement. (8) is similar to the direct nominalization case in (4); the difference lies in the verbiness/nouniness of the suffix in question. This analysis would have to posit that for some reason, relatives (or extended VPs in general) cannot directly modify nouns: they must be nominalized before they can be merged in an adnominal position (9).

(8) nominalization



(9) relative



The three hypotheses discussed above may all be options afforded by Universal Grammar, materializing in different languages of the world. In other words, the participle-nominalizer polysemy does not necessarily have to receive the same analysis cross-linguistically; it should be investigated on a case-by-case basis which analysis is most explanatory for the dataset of a given language.

3 The participle-nominalization polysemy in Udmurt

As said in the introduction, the Udmurt suffix *-m* is employed in both RCs and deverbal nouns. Most deverbal nouns with *-m* have a complex internal structure, with the base verb's arguments retained. We will argue that these correspond to English verbal gerunds (the gerundive nominals of *Remarks*). In addition, *-m* is also employed in result nouns (RNs) (the derived nominals of *Remarks*) and other deverbal nouns which look like simple event nouns (SENs). These are illustrated below (cf. GSUJa I 1962: 117–118 and Winkler 2001: 58).

- (10) *kjl'-em*, *ńula-m*, *vera-m*, *kul-em*, *piž-išk-em*, *kjn-t-em*
 remain-m, sweat:V-m speak-m, die-m, bake-INTR-m frost-CAUS-m
 'leftovers, sweat, speech/utterance, dead person, pastry, ice-cream' [RN]
- (11) *puk-em*, *uža-m*, *vordišk-em*, *vu-em*, *kjrdža-m*, *kjnma-m*
 sit-m work:V-m be.born-m arrive-m sing-m get.cold-m
 'sitting, working, birth, arrival, singing, getting/having a cold' [SEN?]

Udmurt *-m* deverbal nouns thus fall into different types, similarly to English. Below we present the key diagnostics with which gerunds and RNs can be told apart. It will be shown, however, that we do not find enough evidence for positing a third type of deverbal noun, namely, SENs. We also discuss the (morpho)syntactic properties of *-m*-relatives.

3.1 Verbal gerunds

An example of a verbal gerund (henceforth, gerund) is given in (12).

- (12) [Pet'a-len pinal-jos-se kńiga(-jez) liddž-jt-ıl-em-ez]
 Petya-GEN child-PL-POSS:3SG.ACC book-ACC read-CAUS-FREQ-m-POSS:3SG
 mįnįm jaraz.
 1SG.DAT appeal.PST.3SG
 'I liked (the fact) that Petya made his children read a/the book (several times).'

Sentence (12) shows that gerunds have several verbal properties, such as (i) the presence of aspect morphology (cf. the frequentative suffix), (ii) the possibility of expressing voice morphology (cf. the causative suffix), (iii) full argument structure (i.e. subject and an accusative-marked direct object), and (iv) an event reading.

The presence of frequentative and causative markers suggests that the extended verb phrase of gerunds includes an AspP and a VoiceP.³ The presence of a *v*P is also supported by the fact that agent-oriented adverbs (e.g. *juri* 'deliberately') and manner adverbs (e.g. *ros-pros* 'thoroughly, in detail') are also licit with gerunds (13).⁴

- (13) [Maša-len ta śariś juri ros-pros jua-l'l'a-śk-em-ez]
 Masha-GEN this about deliberately thoroughly ask-FREQ-INTR-m-POSS:3SG
 Kol'a-lj ę-z jara.
 Kolya-DAT NEG.PST-3 appeal.CN.SG

³Following Tánzos (2016), we assume that causatives in Udmurt involve a VoiceP, but nothing hinges on this and our analysis is fully compatible with a *v*P-analysis of causatives.

⁴Udmurt adverbs do not take any extra morphological marking compared to adjectives, thus many words are ambiguous between an adverb and an adjective. We circumvent this problem by using adverbs which cannot be used as adjectives (*juri* 'deliberately', *ros-pros* 'thoroughly, in detail' and *pir-poč* 'in detail, accurately'), thus their adverbial status is not in question.

‘Kolya didn’t like that Masha deliberately keeps/kept asking thoroughly about this.’

Furthermore, gerunds can only be modified by adverbs, but not by adjectives. In (14), only the adverbial *pertem šamen* ‘in different ways’ is allowed; the adjective *pertem* ‘different’ is ruled out.

- (14) [Pinal-jos-len Lijm Tęd’i-jez *pertem / pertem šam-en kirdža-m-zij]
 child-PL-GEN Snow White-ACC different:ADJ / different way-INS sing-m-POSS:3PL
 mįnįm jaraz.
 1 SG.DAT appeal.PST.3SG
 ‘I liked that the children sang the song "Snow is White" in different ways.’

On the other hand, gerunds also show "nouny" behaviour: (i) they appear as the complement of Ps and structural/oblique cases,⁵ (ii) their subject is genitive-marked, similarly to regular possessors and (iii) the participial verb bears possessive morphology agreeing with the genitive-marked subject. Let us take a closer look at these properties.

As for their distribution, gerunds can be used as subjects (cf. examples (12)–(14) above) and objects (cf. (18b) below). Crucially, unlike finite clauses, they are also used as complements of structural/semantic cases and postpositions, as in (15). Thus based on their external distribution, gerunds clearly show nominal rather than clausal behaviour.

- (15) [So-len pu daša-m-ez-lį] anaj-ataj-ez tuž
 3SG-GEN wood.ACC prepare-m-POSS:3SG-DAT mother-father-POSS:3SG very
 šumpotem.
 be.happy.EVID.3SG
 ‘His_i parents were very happy about his_i preparing wood.’ (Kel’makov & Hännikäinen 1999: 207)

Furthermore, the subject of the gerund is encoded with the genitive case, similarly to possessors.⁶ It must be emphasized that the genitive-marked noun always corresponds to the subject of the gerund and cannot correspond to the internal argument (16). This means that Udmurt gerunds are, in fact, similar to English verbal gerunds.

- (16) *[Pinal-len vaj-em-ez] umoj ortć-i-z.
 child-GEN bring-m-POSS:3SG well pass-PST-3SG
 Intended: ‘The child’s birth went well.’

⁵Udmurt *-m* gerunds are selected by different predicates, e.g. *todįni* ‘to know sth/about sth; to find out sth’, *jara* ‘to appeal, like’, *šumpotįni* ‘to be happy about something’, *addįzi* ‘to see’, *vit’įni* ‘to wait (for something to happen)’ (for a complete list see Serdobolskaya et al. 2012). Serdobolskaya et al. (2012: 455) and Klumpp (2016: 578–580) argue that unlike finite subordination, gerunds typically express given information.

⁶The similarity between subjects of gerunds and possessors is particularly striking in argument clauses. Adverbial clauses, on the other hand, show a strong tendency *not* to be nominalized, i.e. their subject appears in the nominative case and they do not bear possessive agreement (for a discussion see Georgieva 2018). Similar facts have been reported for other Finno-Ugric and Altaic languages, e.g. Tatar (Sahan 2002; Lyutikova & Ibatullina 2015), Kazakh (Ótött-Kovács 2016), Modern Standard Turkish (Kornfilt 2001, 2003) and Sakha (Baker 2011), which has raised the question whether subjects of gerunds and possessors can be fully assimilated, and the account of non-finite adjunct clauses is still open to debate. In Udmurt at least, subjects of gerunds used as argument clauses appear in the genitive case (see Serdobolskaya et al. 2012; Brykina & Aralova 2012; Georgieva & Ótött-Kovács 2016, 2017; Dékány & Tánčzos 2017; Georgieva 2018). There are two potential exceptions discussed in Georgieva (2018: 66–68): (synthetic) compounds and dative-arguments. In this paper we leave these cases aside, as the precise account of these patterns would require further research, and we concentrate on gerunds with genitive-marked subjects.

Similarly to possessors, the subjects of gerunds also display the so-called ‘genitive–ablative alternation’. Possessors bear genitive case by default, but possessors of direct objects must have ablative marking (17). Genitive-marked subjects also turn to ablative in object clauses (18).⁷

- (17) a. [Pet’a-len/*leś puni-jez] ute.
Petya-GEN/ABL dog-POSS:3SG bark.PRS.3SG
‘Petya’s dog is barking.’
b. [Pet’a-*len/leś puni-ze] šud-i.
Petya-GEN/ABL dog-POSS:3SG.ACC feed-PST.1SG
‘I fed Petya’s dog.’
- (18) a. [Djšetiś-len/*leś djšetskiś-jos-lj urok-jos-iz valekt-em-ez] mñim jaraz.
teacher-GEN/ABL student-PL-DAT lesson-PL-ACC explain-m-POSS:3SG 1SG.DAT
appeal.PST.3SG
‘I liked that the teacher explained the lessons to the students.’
b. [Djšetiś-*len/leś djšetskiś-jos-lj urok-jos-iz valekt-em-ze]
teacher-GEN/ABL student-PL-DAT lesson-PL-ACC explain-m-POSS:3SG.ACC
vañ-zj todo.
all-3PL know.PRS.3PL
‘Everybody knows that the teacher explains/explained the lessons to the students.’

Furthermore, the possessive agreement morphology on the gerund is obligatory. This also suggests that gerunds obligatorily include a subject argument as well, even if it is a covert one, i.e. a *pro*. Example (19) contains a non-nominalized gerund, i.e. no possessive agreement and no overt subject, with an intended arbitrary reading, and it is judged as ungrammatical.

- (19) *[Radio pñr vñl’ udmurt kñrdžan-jos vožmat-em] mñim jaraz.
radio via new Udmurt song-PL show-m 1SG.DAT appeal.PST.3SG
Intended: ‘I liked the playing of new Udmurt songs on the radio.’

The nouny properties of gerunds are limited, however. We have seen that adjectival modification is out (14), and demonstratives are not allowed to modify them either (20).⁸ Demonstratives are ruled out even when there is no genitive-marked subject in the gerund, i.e. demonstratives cannot replace the subject (21).

- (20) *<Ta> [djšetiś-len *<ta> urok-ez *<ta> ros-pros valekt-em-ez]
this teacher-GEN this lesson-ACC this thoroughly explain-m-POSS:3SG
mñim jaraz.
1SG.DAT appeal.PST.3SG
‘I liked that the teacher explained the lesson thoroughly.’
- (21) *[Ta urok-ez ros-pros valekt-em] mñim jaraz.
this lesson-ACC thoroughly explain-m 1SG.DAT appeal.PST.3SG
Intended: ‘I liked this explanation of the lesson thoroughly.’

⁷On the genitive–ablative alternation see Edygarova (2010); for a possible theoretical account see Assmann et al. (2014). Here we do not wish to commit ourselves to a particular analysis of this alternation; what we consider important is that subjects of gerunds pattern after possessors in terms of case-marking.

⁸Since Udmurt is an articleless language, we cannot test the possibility of modifying gerunds by an article.

Plural marking is also ungrammatical with gerunds (22) (see Serdbobolskaya et al. 2012; Dékány & Tanczos 2017; Georgieva 2018).

- (22) [Dįsetiś-leś dįsetskiś-jos-lį urok-jos-įz (tros pol) valekt-em-ze
 teacher-ABL student-PL-DAT lesson-PL-ACC many times explain-m-POSS:3SG.ACC
 / *valekt-em-jos-se] vań-zį todo.
 explain-m-PL-POSS:3SG.ACC all-3PL know.PRS.3PL
 ‘Everybody knows that the teacher explains/exploined the lessons to the students
 (many times).’ (Georgieva 2018: 49)

Based on these facts, we conclude that Udmurt gerunds have both nominal and verbal properties, and they resemble English verbal gerunds rather than Grimshaw’s (1990) *complex event nominals*.

3.2 Result nouns

Recall that the suffix *-m* can also form result nouns (RN). Some examples are repeated below for the reader’s convenience. As can be seen from (23), RNs are typically derived from transitive or unaccusative verbs. They often have a lexicalized/idiomatic meaning.

- (23) kįl’-em, ńula-m, vera-m, piż-iśk-em, kįn-t-em
 remain-m, sweat:v-m speak-m, bake-INTR-m frost-CAUS-m
 ‘leftovers, sweat, speech/utterance, pastry, ice-cream’

RNs can only be modified by adjectives:

- (24) Dżek vįlįn pętem / *pętem śam-en kįl’-em-jos vań.
 table on different:ADJ different way-INS remain-m-PL COP
 ‘There are different leftovers on the table.’

Furthermore, in contrast to gerunds, RNs can be modified by demonstratives (25). This example also shows that RNs can be pluralized.

- (25) So kįl’-em-jos-tį kuśt-ono.
 that remain-m-PL-ACC throw.away-PTCP.FUT
 ‘Those leftovers are to be/have to be thrown away.’

Some of these RNs contain voice or causative morphology, e.g. *piżi-śk-em* ‘pastry’ or *kįn-t-em* ‘ice-cream’ (we will return to the presence of voice and causative morphology in RNs in section 5.3). Crucially, frequentative morphology is illicit in RNs, suggesting that RNs contain a small verbal structure:

- (26) a. *Piż-iśk-įl-em dżek vįlįn.
 bake-INTR-FREQ-m table on
 b. *Piż-įl-iśk-em dżek vįlįn.
 bake-FREQ-INTR-m table on
 Intended: ‘The pastry baked several times is on the table.’

Since RNs are clearly nouns, they can be possessed, however the genitive-marked noun does not (necessarily) correspond to the subject argument of the base verb, as indicated in the translation line of (27) and (28). Thus, we conclude that the genitive noun in RNs is a possessor rather than a subject.

- (27) Pet'a-len piž-išk-em-ez džek viľin.
 Petya-GEN bake-INTR-m-POSS:3SG table on
 'The pastry baked/bought/eaten by Petya is on the table.'
- (28) [...] so-lj kofta-len kertt-em-ez tuž kel'šem.
 3SG-DAT sweater-GEN knit-m-POSS:3SG very appeal.EVID.3SG
 '[...] s/he very much liked the knitting pattern of the sweater' (Kel'makov & Hännikäinen 1999: 207)

The following table summarizes the main properties of gerunds and RNs.

	Gerund	RN
Event reading	✓	✗
Argument structure	✓	✗
GEN-marked noun	subject	possessor
Frequentative morphology	✓	✗
Dem modification	✗	✓
Adj/adv modification	adv	adj
Plural	✗	✓

3.3 Are there simple event nouns with *-m* in Udmurt?

In addition to the deverbal nouns with complex internal structure that we argued to be verbal gerunds, we also find other event-denoting deverbal nouns with *-m* that show rather different morphosyntactic properties in comparison to gerunds. Some examples are given in (29):

- (29) puk-em, uža-m, vordišk-em, vu-em, kirdža-m, kınma-m,
 sit-m work:V-m, be.born-m, arrive-m sing-m get.cold-m
 'sitting, working, birth, arrival, singing, getting/having a cold'

Given that nominalizations show different complexity: *complex event nouns*, *simple event nouns* and RNs and given that Udmurt utilizes verbal gerunds and RNs, one might raise the question whether a third, intermediate type, broadly corresponding to SEN, is also attested in Udmurt. By definition, SENs have an event reading, but lack argument structure, in other words, no internal argument and no subject are found (see Grimshaw 1990; Moulton 2014).

Probing for SENs in Udmurt is problematic, however, as SENs derived with *-m* from transitives do not seem to be attested (30).⁹

- (30) [*Jenat-em / jenat-on] kema kistišk-i-z.
 cure-m cure-n long be.prolonged-PST-3SG
 'The treatment took a lot of time to finish.'

⁹We think that there are two language-specific reasons for this gap. The first is that Udmurt also utilizes another nominalizer (*-n*) that seems to be used in these cases, cf. (30) (the differences between the two nominalizers are rather poorly understood, see Kalinina 2001; Serdobolskaya et al. 2012; Brykina & Aralova 2012; Klumpp 2016; Georgieva 2018). The second reason is that Udmurt also has a fully productive intransitivizer (*-šk*) used to derive passive, antipassive, anticausative and reciprocal verbs (see Tanczos 2016, 2017; F. Gulyás & Speshilova 2014); thus, it might be the case that the productive use of intransitivising morphology "bleeds" the formation of SENs from transitive verbs.

The examples in (29) are all derived from intransitives. We will argue that intransitive verb-based nominalizations in Udmurt correspond either to verbal gerunds or to RNs. These two types can be distinguished with the help of the diagnostics we present below. Thus, in our view, we do not find enough evidence for positing a third category, i.e. SEN formed with *-m*.

Firstly, frequentative morphology is possible, as shown in (31), thus indicating the presence of AspP. Agent-oriented adverbs are also licit (32).

- (31) [Kol'a-len tetća-l'l'a-m-ez] anaj-ataj-os-se
 Kolya-GEN jump-FREQ-m-POSS:3SG mother-father-PL-POSS:3SG.ACC
 pajmjt-i-z.
 amaze-PST-3SG
 'Kolya's jumping/dancing amazed his parents.'¹⁰
- (32) [Kol'a-len (divan vjljn) juri tetća-m-ez]
 Kolya-GEN sofa on deliberately jump-m-POSS:3SG
 anaj-ataj-os-iz-lj e-z jara.
 mother-father-PL-POSS:3SG-DAT NEG.PST-3 appeal.CN.SG
 'Kolya's parents didn't like his deliberate jumping/dancing on the sofa.'

Thus, based on these two criteria, these deverbal nouns behave like gerunds. However, they allow for either adjectival or adverbial modification (33). In this respect, they resemble Polish *-nie/-cie*-nominalizations (Alexiadou et al. 2010), German nominal infinitives (Alexiadou et al. 2011) and English process nominals (Fu et al. 2001).

- (33) [Kol'a-len pertem / pertem sam-en tetća-m-ez]
 Kolya-GEN different:ADJ different way-INS jump-m-POSS:3SG
 anaj-ataj-os-se pajmjt-i-z.
 mother-father-PL-POSS:3SG.ACC amaze-PST-3SG
 'Kolya's <different> dancing/jumping <in different ways> amazed his parents.'

Furthermore, they can be pluralised, as shown in (34) and (35). Observe that in the singular, the deverbal noun is ambiguous. However, in the plural, the deverbal noun does not express (multiple) instances of the same event, but rather different *types* of events, i.e. different (types of) swings. This interpretation is given as a 'manner' reading below.

- (34) [Ivan-len dzećjra-m-ez] anaj-ataj-os-se pajmjt-i-z.
 Ivan-GEN swing-m-POSS:3SG mother-father-PL-POSS:3SG.ACC amaze-PST-3SG
 'The way in which Ivan was swinging amazed his parents.' 'manner'
 'Ivan's swinging amazed his parents.' 'event'
 (Georgieva 2018: 53)
- (35) [Ivan-len dzećjra-m-jos-iz] anaj-ataj-os-se pajmjt-i-zi.
 Ivan-GEN swing-m-PL-POSS:3SG mother-father-PL-POSS:3SG.ACC amaze-PST-3PL
 'The ways in which Ivan was swinging amazed his parents.' 'manner'
 '*Ivan's swingings amazed his parents.' 'event'
 (Georgieva 2018: 53)

Thus, on the one hand, these deverbal nouns show a verbal structure similar to verbal gerunds, but on the other hand, they seem to be more "nouny". We would like to cash this out by proposing that those deverbal nouns that are pluralisable and allow for adjectival

¹⁰The verb *tetća-* can either mean 'jump' or 'dance', depending on the context.

modification are actually RNs. This is supported by the fact that the pluralisable deverbal noun in (35) cannot have an event reading.

Further support in favour of this view comes from the interpretation of the genitive-marked noun in these deverbal nouns (which also follow the genitive-ablative alternation discussed in the previous subsection). The genitive-marked noun is interpreted as the subject of the deverbal noun in an out-of-the-blue context (36a), but speakers also allow for a non-subject interpretation, if provided an appropriate context. Thus, *Kol'a* can also be construed as a non-subject, for instance in the following context: 'Kolya has invented a special kind of jump. But he was sick today, so Petya had to perform Kolya's special jump(s) instead of him', cf. (36b).

(36) Context: Kolya is an acrobat in the circus.

- a. [Kol'a-len tetća-m-ez] ućkiś-jos-tj pajmīt-i-z.
 Kolya-GEN jump-m-POSS:3SG spectator-PL-ACC amaze-PST-3SG
 'Kolya's jumping amazed the spectators.' (subject reading) [gerund]
- b. [Kol'a-leś tetća-m-ze] Ivan voźmat-i-z.
 Kolya-ABL jump-m-POSS:3SG.ACC Ivan show-PST-3SG
 'Kolya's jump was performed by Ivan.' (non-subject reading) [RN]

The non-subject interpretation of the genitive-marked noun in (36b) suggests that we are dealing with an RN. In fact, such an interpretation is impossible if an agent-oriented adverb is present, even with the appropriate context (37). We propose that in this case we are dealing with a gerund. Recall that gerunds obligatorily contain a subject, and are thus incongruent with the non-subject reading supplied by the context.

- (37) ??/#[Kol'a-leś juri tetća-m-ze] Ivan voźmat-i-z.
 Kolya-ABL deliberately jump-m-POSS:3SG.ACC Ivan show-PST-3SG
 Intended: 'Kolya's deliberately jumping was performed by Ivan.' [gerund]

The crucial piece of evidence against the analysis of intransitive-based deverbal nouns as SENs comes from cases in which the deverbal noun does have an event-reading, and it is thus compatible with predicates like *take place/last X hours*, but lacks arguments. Recall from the previous subsection that gerunds always retain the base verb's arguments, as evidenced by the obligatory possessive morphology on them. Thus, the deverbal noun in examples like (38) cannot be a gerund. Since its intended meaning denotes an event, this would be the perfect candidate to be labeled as SEN. However, the example is ungrammatical, suggesting that intransitive-based deverbal nouns in Udmurt are not SENs.

- (38) *Tolon cirk-ĭn tetća-m odig čas (čože) mĭn-i-z.
 yesterday circus-INE jump-m one hour for go-PST-3SG
 Intended: 'Yesterday, the jumping in the circus lasted one hour.'

In our view, the most straightforward way to explain the mixed properties of the deverbal nouns derived from intransitive verbs is to say that they can either exemplify gerunds or RNs, and the two types can be told apart with the above-mentioned tests. Thus, we do not find enough evidence to classify them as SENs.

3.4 Participial RCs

Relatives with *-m* are prenominal, non-finite modifiers of nouns. Similarly to the gerunds discussed above, *-m*-relatives can have an accusative object and adverbial modifiers, and the participial verb may be inflected for voice and aspectual morphology (39).¹¹

- (39) a. [tros pol liddž-ıl-em] knıga
 many times read-FREQ-m book
 ‘the book read many times’
 b. [pići dırjaz tros pol knıga liddž-ıt-ıl-em] murt
 young as many times book.ACC read-CAUS-FREQ-m person
 ‘a/the person who was made to read a book several times as a child’

However, in contrast to verbal gerunds, participial RCs may lack a subject altogether, as shown by the lack of possessive morphology in (39). Previous work on relatives has identified two different case possibilities for overt subjects: they can bear either an instrumental or a genitive suffix (40a,b). In the latter case a possessive agreement suffix cross-referencing the subject’s ϕ -features appears on the head noun (Kalinina 2001; Serdbobolskaya et al. 2012; Brykina & Aralova 2012; see also Georgieva 2018: 57–62).¹²

- (40) a. [Pet’a-jen tue mertt-em] pıspu umoj bude.
 Petya-INS this.year plant-m tree well grow.PRS.3SG
 ‘The tree planted by Petya this year is growing well.’
 b. [Pet’a-len tue mertt-em] pıspu-ez umoj bude.
 Petya-GEN this.year plant-m tree-POSS:3SG well grow.PRS.3SG
 ‘The tree planted by Petya this year is growing well.’ (Georgieva 2018: 60)

The pattern in (40b) whereby possessive agreement tracks the feature specification of the subject but appears on the head noun rather than the participial verb is also known as non-local agreement. It is an areal feature of Central and Northern Eurasia, found in Uralic, Mongolic, Turkic, Tungusic and Indo-European languages as well as Palaeosiberian isolates (Ackerman & Nikolaeva 2013: 66).

In the next sections we turn to the analysis of *-m*-relatives and *-m*-nominalizations. First, in section 4 we will consider the possibility of analyzing *-m* as a nominalizer. This line of analysis will be discarded, though. Then, in section 5 we will present a verbal analysis of the suffix and an unified treatment of relatives and nominalizations.

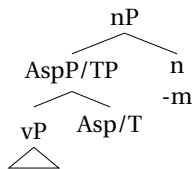
¹¹The example in (39b) does not contain an overt causer in contrast to the verbal gerund in (12). This might be due to independent reasons, thus it is not necessarily suggestive of structural differences between *-m*-relatives and *-m* gerunds. For instance, some differences might be attributed to the impossibility of relativizing certain arguments, e.g. a causer (to our knowledge relativization of causatives has not been discussed in the literature, e.g. in Brykina & Aralova 2012). What is crucial for our purposes is that voice and aspect morphology can appear on both participial relatives and gerunds.

¹²Additionally, it has been claimed that the subject of RCs can bear nominative case (Kalinina 2001: 88 and Serdbobolskaya et al. 2012; Brykina & Aralova 2012 consider this pattern marginal in the Beserman dialect of Udmurt). Georgieva & Ótrott-Kovács (2016: 56) argue that nominative subjects are ungrammatical in today’s Udmurt and Georgieva & Ótrott-Kovács (2017) point out that all attested examples come from older sources. For this reason, in the present paper we disregard this pattern.

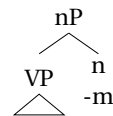
4 Against treating *-m* as a nominalizer

As discussed in the previous section, Udmurt *-m* forms appear in participial RCs and nominalizations. If the Udmurt *-m* suffix is a nominalizing head, then verbal gerunds and result nominals can be captured by attaching *-m* at different heights in the functional sequence: to TP/AspP/VoiceP/vP in the case of gerunds and the VP in the case of RNs.¹³

(41) verbal gerunds



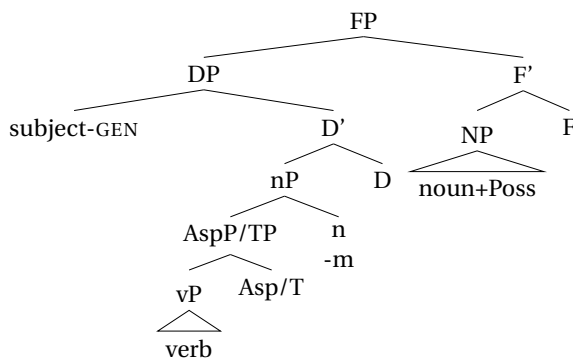
(42) RNs



However, if gerunds and RNs are derived with the same nominalizer head, then it remains mysterious why only the latter can be modified like non-derived nouns. Alexiadou (2013, this volume) argue that the presence of a nominalizing head (*n*) licenses nominal modifiers, e.g. adjectives and number marking. Indirect nominalization, where a VP is embedded directly under a nominal functional head, on the other hand, is incompatible with such modification. If both gerunds and RNs involve the same nominalizer, then it is unclear why (the projections responsible for) adjectival modification and plural marking can embed (42) but not (41).

Treating *-m* as a nominalizer is even more problematic when we turn to the analysis of *-m* relatives. Relatives with an overt genitive subject could be treated as in (43), with a DP topping off the nominalizing layer. The subject then could be moved to or inserted directly into spec,DP, receiving genitive case there, similarly to possessors. The appearance of the possessive suffix on the head noun could be taken to indicate that relatives with a genitive subject involve a nominal structure modifying the head noun indeed.

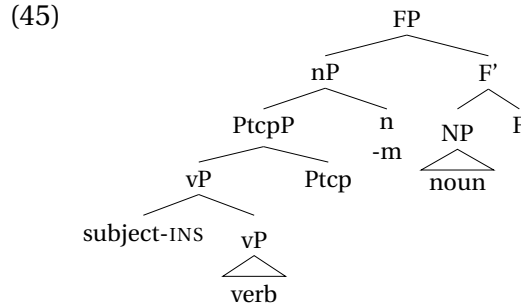
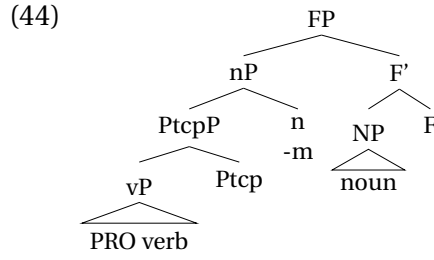
(43) rejected structure for relatives



The analysis of relatives which have an instrumental subject or no overt subject is highly problematic, however. Relatives with covert subjects would have the structure in (44). Outside of relatives, instrumental subjects in Udmurt also occur in passives (F. Gulyás & Speshilova 2014), where they function as the equivalents of English *by*-phrases. We suggest that in both passives and relatives, an instrumental subject is a demoted PP-subject which does not

¹³We assume with Hale & Keyser (1993); Bowers (1993); Arad (1996); Den Dikken (2015), among others, that objects are introduced in a specifier position, and that this position is outside of the VP. Thus cutting off the projection line at the VP level yields nominalizations without arguments.

occupy the canonical subject position but is instead adjoined to vP (the projection which introduces the subject of active sentences). Relatives with an instrumental subject would then be represented as in (45).



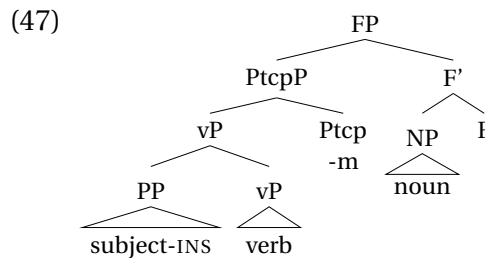
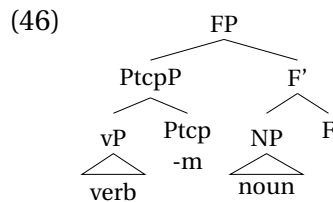
Relatives with a covert subject and with an instrumental subject cannot reasonably be analyzed as nominals, however: they show no independently verifiable nominal properties whatsoever (recall that they do not trigger the appearance of the possessive suffix on the head noun either). We consider this to be an insurmountable problem for the nominalizer analysis of *-m*, and therefore reject it. This leads us to conclude that *-m* is best treated as an exponent of a verbal head, which we will call *Ptcp*. In the remainder of the paper we explore the details of this analysis.

5 A verbal analysis of *-m*

In the traditional grammars and in some recent descriptive studies (cf. GSUJa I 1962; Kalina 2001; Brykina & Aralova 2012; Serdobolskaya et al. 2012) two different suffixes *-m* were assumed: one that appears in participial RCs and another that surfaces in verbal gerunds (RNs with *-m* are not discussed in these studies in detail). In light of the participle-nominalizer polysemy discussed in section 1, however, we will pursue a unified analysis for the suffix of *-m*-relatives and *-m*-nominalizations. Below we spell out our proposal regarding relative clauses, verbal gerunds and result nouns.

5.1 Participial RCs

With *-m* as a spellout of a head in the extended VP, the core structure of participial RCs can be depicted as in (46). (As the Udmurt extended NP is generally head-final, we assume that FP is also a head-final projection, but nothing hinges on this.) We suggest that internal to the non-finite *PtcpP*, no structural case is available for the subject. As a result, the subject can appear only if it is demoted to a PP-adjunct (47).



As already mentioned in section 3, descriptive grammars also discuss relatives which feature an overt genitive subject and possessive agreement on the head noun.

- (48) [Pet'a-len tue mertt-em] pispu-ez umoj bude.
 Petya-GEN this.year plant-m tree-POSS:3SG well grow.PRS.3SG
 'The tree planted by Petya this year is growing well.' (Georgieva 2018: 60)

We suggest, however, that these examples have been misanalyzed: in contrast to instrumental NPs, genitive NPs are not true subjects of the relative. Evidence in favour of this conclusion is found in the relative order of nominal modifiers in the Udmurt DP. The basic order of N-modifiers is (49).

- (49) possessor > demonstrative > participial RC > numeral > adjective > noun

As demonstratives follow possessors but precede relatives, they can be used to test the position of genitive NPs. It turns out to be the case that a genitive NP can only precede the demonstrative (which in turn precedes the relative) (50). Instrumental subjects, on the other hand, are clearly in the RC (51).

- (50) a. Pet'a-len ta [tue mertt-em] pispu-ez umoj bude.
 Petya-GEN this this.year plant-m tree-POSS:3SG well grow.PRS.3SG
 b. ??Ta [tue Pet'a-len mertt-em] pispu-ez umoj bude.
 this this.year Petya-GEN plant-m tree-POSS:3SG well grow.PRS.3SG
 'This tree planted by Petya this year is growing well.'
- (51) Ta [kij'em ar-in pešataj-en pukt-em] korka tolon džuaz.
 this last year-INE grandfather-INS build-m house yesterday burn.PST.3SG
 'This house built by grandfather last year burned down yesterday.'

This shows that genitive NPs occupy a different position from instrumental subjects: while the latter are inside the relative, the former are not. We conclude from the contrast above that the genitive NP is merged outside of the relative, in the ordinary possessor position of the head noun (i.e. spec,DP).

The reader will recall that possessors bear genitive case by default, but possessors of objects have to be ablative marked (17). Crucially, 'genitive subjects' of relatives modifying an NP in object position must also switch to ablative.

- (52) a. Pet'a-len/*leś mertt-em pispu-ez umoj bude.
 Petya-GEN/ABL plant-m tree-POSS:3SG well grow.PRS.3SG
 'The tree planted by Petya is growing well.'
- b. Pet'a-*len/leś mertt-em pispu-ze kora-j.
 Petya-GEN/ABL plant-m tree-POSS:3SG.ACC cut-PST.1SG
 'I cut the tree planted by Petya.'

As we analyze the genitive NP as a possessor, this is exactly what we predict (no such prediction is made if the genitive NP is an RC-internal subject, however). The case facts thus support our proposal from yet another angle. A further pay-off of our account is that the obligatory possessive agreement between the 'genitive subject' and the head noun can receive a simple, natural explanation: this is a garden-variety (local) possessive agreement between a possessor and a possessum.

Further support for the possessor analysis of the genitive NP comes from inanimate subjects. Crucially, they are degraded in the genitive, but fully grammatical in the instrumental case (53).

- (53) a. ??[zor-len mišk-em] šures-ez b. [zor-en mišk-em] šures
rain-GEN wash-m road-POSS:3SG rain-INS wash-m road
‘the road washed by the rain’ ‘same as (a)’ (Georgieva 2018: 62)

We argue that this falls out from the possessor analysis: the inanimate NP cannot be construed as a possessor (even in a very vague possessor relation), as it has a Cause thematic role.¹⁴

With the genitive NP sitting outside of the RC, we must answer the question of why examples containing such NPs are normally ambiguous between a possessor reading and a subject reading.

- (54) mil’am mertt-em pispu-os-mi
1PL.GEN plant-m tree-PL-POSS:1PL
‘the trees that we planted’ (subject reading)
‘our trees planted (by someone)’ (possessor reading)
(Georgieva & Ótrott-Kovács 2016: 56)

It has been known for a long time that possessive structures do not necessarily express possession proper. Instead, they code an underspecified relationship between the possessor and the possessee, the nature of which is interpreted based on the context (Williams 1981). Thus possessive structures may express a family relationship (*my father*), a part-whole relationship (*the roof of the house*), a thematic relationship (*the city’s destruction*), authorship (*my book which I wrote*), and other vague, entirely context-based relationships as well (*my train leaves in an hour*). Similar uses of possessive constructions are attested in Udmurt as well (see Edygarova 2010 for discussion). Thus, following Kratzer (1996), we suggest that in Udmurt, too, agentivity or actorhood is one of the ways in which the underspecified possessive relationship can be understood (see also the references in Borer this volume: fn. 5). As an alternative to this pragmatic linking of possessor to subject, syntactic linking is also possible when the possessor in spec,DP binds a covert subject inside the RC. In this way, our proposal is similar to Kornfilt’s (2015) analysis of a type of RC in Sakha and Ótrott-Kovács’s (2019) analysis of Kazakh RCs.

The alternative analysis, namely, that the genitive NP is the subject of the RC, has received a lot of attention in literature, see Hale (2002); Aygen (2011); Kornfilt (2005, 2015); Asarina &

¹⁴Although the possessive relationship might be rather vague, it is impossible to establish such a relationship between a [cause] NP and an NP affected by the [cause]. Thus, (i) cannot have the intended meaning:

- (i) zor-len šures-ez
rain-GEN road-POSS:3SG
*‘the road destroyed/washed/cleaned by the rain’

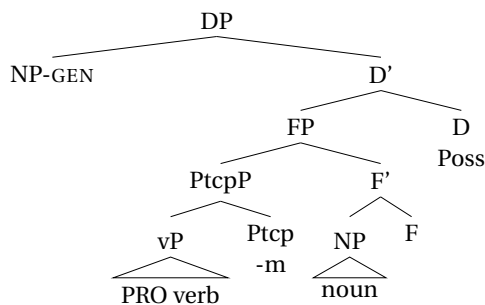
A reviewer remarks that (53) is possibly an instantiation of the so-called ‘Direct Participation Effect’ (Sichel 2010), whereby prenominal genitives and *by*-phrases of derived nominals must encode a direct participant in the event (cf. *the hurricane’s destruction of our crops* vs. **the hurricane’s justification of the evacuation*). However, the [cause] NP in (53) is the direct causer of the event, thus the DPA cannot explain the ungrammaticality of (53a). Even more strikingly, verbal gerunds allow for [cause] subjects:

- (ii) [Zor-len šures-ez mišk-em-ez-lj] gurto-os šumpoto.
rain-GEN road-ACC wash-m-POSS:3SG-DAT villager-PL be.happy.PRS.3PL
‘The villagers are happy about the rain’s washing of the road.’

We interpret this as additional support for the analysis presented in this paper, namely, that the genitive NP that appears with RCs is a possessor, but the genitive NP of gerunds is a subject.

Hartman (2011); Ótrott-Kovács (2016) on Altaic languages and Nikolaeva (1999); Ackerman & Nikolaeva (2013) on Northern Khanty. If the genitive NP is indeed the subject, then the question arises why agreement is marked on the head noun and not on the participle, instantiating a non-local agreement pattern. We refer the reader to the studies mentioned above for discussion of various proposals regarding this agreement pattern, but we do not discuss them in detail since in our view, the Udmurt data do not support the subject analysis of genitive NPs, thus the placement of agreement on the head noun is not unexpected. In our view, relative clauses with a ‘genitive subject’ have the structure shown in (55), i.e. they are garden-variety possessives with a participial RC modifier.

(55) RCs with ‘genitive subjects’



To summarize, we propose that *-m*-relatives are extended non-finite VPs (with no nominalization involved). These relatives can occur without overt subjects and with instrumental subjects. In contrast to the previous descriptions, however, there are no relatives with genitive subjects: the genitive NP is merged outside of the relative, as a possessor of the head noun.

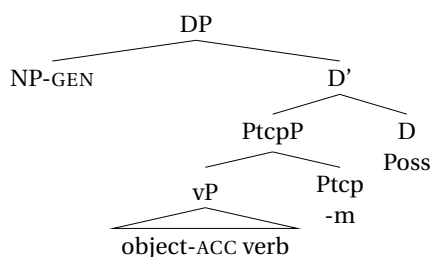
5.2 Verbal gerunds

Let us now turn to the analysis of verbal gerunds with *-m*. Earlier we established that *-m* is a verbal head, thus the core of all *-m* phrases is (56).

(56) [PtcpP vP Ptcp=*-m*]

We have also seen that gerunds have an external nominal distribution: they take possessive marking and case marking and also combine with postpositions. Nouny syntax is also observable on their left edge: their subject bears genitive case and participates in the genitive-ablative alternation, like possessors do. However, the rest of the internal syntax of gerunds is not nouny: they resist adjectival and demonstrative modification as well as plural marking. We suggest that this set of properties naturally falls out from an indirect nominalization structure in which PtcpP is directly embedded under D. (57) is essentially also the structure proposed for English verbal gerunds in Alexiadou et al. (2011) and Alexiadou (2013).

(57) Verbal gerunds



A further argument in favour of analyzing Udmurt gerunds as topped off only by a DP, without an nP and other nominal layers, comes from verb agreement patterns. As discussed in Abney (1987: 111–112), coordinating English verbal gerunds and *that*-clauses licenses singular agreement on the verb, whereas coordinated nominal gerunds license plural agreement. Applying this to Udmurt, we see that with coordinated gerunds only singular morphology is licit (58), in contrast to coordinated DPs, which trigger plural morphology on the verb (59).

- (58) [Pet'a-len pešanaj-ez-lj emjum baša-m-ez] no
 Petya-GEN father's.mother-POSS:3SG-DAT medicine.ACC buy-m-POSS:3SG and
 [Maša-len čužanaj-ez-lj šaška pukt-em-ez] mɯnjm
 Masha-GEN mother's.mother-POSS:3SG-DAT flower.ACC plant-m-POSS:3SG 1SG.DAT
 kel'se / *kel'so.
 appeal.PRS.3SG appeal.PRS.3PL
 'I like/approve of Petya's buying medicine for his grandmother and Masha's planting flowers for her grandmother.'
- (59) Pet'a-len suzer-ez no Maša-len apaj-ez mɯnjm
 Petya-GEN younger.sister-POSS:3SG and Masha-GEN older.sister-POSS:3SG 1SG.DAT
 *kel'se / kel'so.
 appeal.PRS.3SG appeal.PRS.3PL
 'I like Petya's younger sister and Masha's older sister.'

The DP layer makes it possible for the *-m* phrase to appear in nominal positions. As an added benefit, it also provides a position, i.e. Spec,DP, where the subject of PtcpP can move and receive (genitive) case. This amounts to saying that gerunds are derived possessive structures. That Spec,DP is a derived position for the subject is supported by the fact that subject idiom chunks used in gerunds retain their idiomatic meaning (we adopt this test from Baker 2011). In (60), we use the idiom *porpios ibiliško* 'wood is cracking from the cold' (lit. 'the Mari boys are shooting'):¹⁵

- (60) Context: Today it was a very cold winter day.
 Azbar-e potem val=no, **porpi-os-leś**
 yard-ILL go.out.EVID.1SG COP.PST=ADD Mari.boy-PL-ABL
ib-il-išk-em-zes kili-sa, berlañ korka pjr-i.
 shoot-FREQ-INTR-m-POSS:3PL.ACC hear-CVB back house.ILL go.in-PST.1SG
 'I went out to the yard, but after I heard the wood's cracking from the cold, I went back inside.'

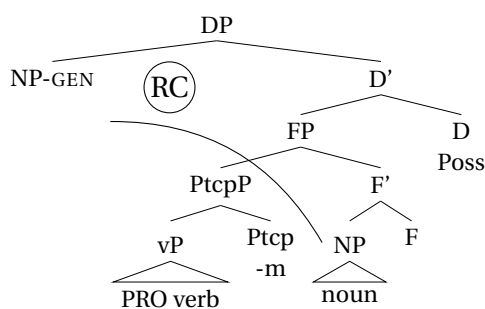
The reader will recall that in participial RCs the subject may be marked with instrumental case (40a). This is not possible in gerunds, however: here the subject must bear genitive case. We propose that this is because demoting the subject to a PP-adjunct in Udmurt is a last resort operation which is employed only if there is no available structural case. We argued that relative clauses are bare PtcpPs, that is, non-finite clauses. As such, they have no structural case for a subject. Therefore the subject either has to be covert (PRO) or if it is to appear overtly, it must be included in a(n instrumental) PP. In verbal gerunds, however, PtcpP is embedded directly under a DP, and in this mixed projection there is structural case available for the subject in Spec,DP. The last-resort operation of subject demotion is therefore not employed here.

¹⁵Thus Udmurt gerunds are analyzed as raising structures. On control structures in verbal gerunds, see Coon & Royer (this volume).

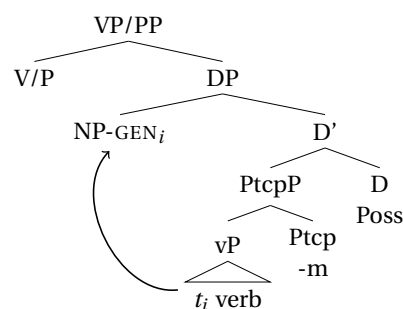
Our proposal provides a unified analysis for participial RCs and gerunds: they feature the same verbal head *Ptcp*, which *-m* expones. *PtcpP* appears on its own in RCs and is part of a mixed extended projection in gerunds. As said at the beginning of this section, recent descriptive studies (Serdbobolskaya et al. 2012; Brykina & Aralova 2012) have argued against unifying RCs and gerunds. One of their arguments was the possibility of instrumental subjects in RCs, in contrast to gerunds. Our analysis overcomes this potential problem. The aforementioned studies also point out two further differences between RCs and gerunds, which concern: (i) their temporal orientation and (ii) negation. Serdbobolskaya et al. (2012) and Brykina & Aralova (2012) argue that *-m* relatives always express an event completed before the time of the matrix predicate, while *-m* gerunds can express not only an anterior event, but also a simultaneous one when selected by perception verbs. Georgieva (2018: 53-55) has shown that gerunds express events whose starting point is anterior to a reference time (thus, we are dealing with relative time, i.e. aspect), but the event need not be completed prior to this reference time. Thus, gerunds are compatible with perception verbs, giving the false appearance of expressing a simultaneous event. Their second argument is that in the Beserman dialect of Udmurt they investigate, negation is only possible with relatives, but not with gerunds. However, the differences with respect to negation are absent from other dialects of Udmurt as well as from the standard variety (see Georgieva 2018: 65).

As we have already seen, *-m*-relatives and *-m* gerunds both interact with possessive agreement. Following Baker (2011), we assume that possessive agreement features are bundled with the D head. Relatives without an overt subject and with an instrumental subject do not trigger possessive agreement (section 3.4). Their structure does not involve a DP, as RCs are bare *PtcpPs* (46). We proposed that relatives with a ‘genitive subject’ involve a noun modified separately by a relative (which has no overt subject) and a relative clause external possessor (61). In these cases possessive agreement appears on the head noun because the head-final DP tops off the extended projection of N. Finally, verbal gerunds were also argued to involve a possessive D, with *PtcpP* in the complement position and the subject of the vP moving to Spec,DP (62). In this case the possessive agreement is linearized on the participial verb because the head-final DP tops off a mixed projection that bottoms out in the verb.

(61) RCs with ‘genitive subjects’



(62) Verbal gerunds



To summarize, the possessive agreement appears on the verb+*m* complex in gerunds but the verb of *-m*-relatives is unmarked (with possible agreement on N). In spite of appearances, however, in our analysis the placement of possessive agreement is governed by the same rule in RCs and gerunds: in both cases it is hosted on D and is linearized on the head of the extended projection.

In section 2 we also sketched a possible analysis in which a *PtcpP* modifies a covert noun, either as a relative clause or as a complement to the covert N (which would have the meaning ‘fact’ or ‘event’), and this gives the mistaken impression that *PtcpP* is nominalized. Let us

now examine if an analysis along these lines is viable for the Udmurt phrases discussed in this section.

A structure in which a participial clause is merged as the complement of a covert noun has been suggested to be part of the grammar of several Altaic languages, e.g. Dagur (Hale 2002), Modern Standard Turkish (Aygen 2011), Japanese (Maki & Uchibori 2008) and Uyghur (Asarina & Hartman 2011). While we do not doubt that this structure is possible in natural languages, the Udmurt data do not seem to lend themselves to this analysis. This is because participial complements of overt nouns do not seem to be attested in Udmurt, in contrast to Uyghur, Korean and Kazym Khanty (see Asarina & Hartman 2011; Kim 2009 and Starchenko 2019). An analysis that posits nouns with no phonological exponent and with different selectional properties from what is otherwise attested for Ns in the language simply lacks empirically solid foundations. Furthermore, as argued by Moulton (this volume), predicates like *true/false* and *believe/know/say* require NP arguments (possibly comprising a covert N with a clausal complement); mixed projections cannot be used with these predicates. This holds for Udmurt, too (63).

- (63) [Kol'a-len tolon k̥k p̥spu mertt-em-ez] šońer evel.
 Kolya-GEN yesterday two tree.ACC plant-m-POSS:3SG true NEG.COP
 *‘That Kolya planted two trees yesterday is just plain false.’ (e.g. because I know that he planted three)¹⁶

That Udmurt gerunds cannot appear with *true/false* and *believe/know/say* constitutes a further counter-argument against treating them as complements of a covert N.¹⁷ Thus we will not explore this route any further here.

Udmurt overt nouns do, however, take participial RC modifiers (see section 5.1), therefore an analysis in which an ordinary participial RC modifies a covert N (and hence gives the impression of nominalization) would be compatible with independently known properties of the language. This is depicted in (65).

- (64) [FP [PtcpP verb-m] F [NP N]]-Poss relative
 (65) [FP [PtcpP verb-m] F [NP covert N]]-Poss ‘gerund’ (relative with a covert head)

Asarina & Hartman (2011) argue that (65) is the structure of some participial expressions in Uyghur. In this language the posited covert nouns freely alternate with overt lexical nouns without a change in meaning. In Udmurt we do not attest a regular alternation between overt and covert nouns in the case of verbal gerunds. The ‘hidden relative’ analysis of verbal gerunds in (65) thus would be most plausible if it relied on a single general, all-purpose covert (light) noun; essentially the covert counterpart of Korean *kes* (Kim 2009) or Kazym Khanty *w̥er* (Starchenko 2019).

Similarly to the mixed projection approach, the hidden RC analysis could also account for the placement of possessive morphology in an elegant way. With a covert N, as in (65), the obligatory nominal suffixes (Poss, Case) attach to the linearly adjacent participial verb for phonological support at PF (cf. Asarina & Hartman’s 2011 analysis of the Uyghur data). Alternatively, we could envision a (postsyntactic) operation that displaces the posses-

¹⁶The example is grammatical, but only with the meaning: ‘That Kolya planted two trees yesterday was wrong/(a) bad (idea)’.

¹⁷The Udmurt equivalents of *believe/know/say* typically select for finite complements. In section 3, we saw that *tođini* ‘to know’ can select for gerunds as well, but this verb can also mean ‘find out’, ‘guess’ or ‘recognize’, so it is plausible to assume that it is not a direct equivalent of English *know*.

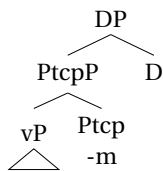
sive morphology from the light noun onto the participial verb of the RC.¹⁸

There are a number of considerations, however, which make this approach less attractive to us than the mixed projection analysis. Firstly, as already mentioned, the free alternation between overt and covert nouns in Uyghur is not attested with Udmurt gerunds, and the existence of an overt light noun in Kazym Khanty and Korean does not make it necessary that Udmurt has a covert counterpart of this lexical item. Secondly, (65) posits a nominal head to Udmurt gerunds, but as already discussed before, these phrases lack genuine nominal properties (such as adjectival or demonstrative modification). This property could perhaps be ascribed to the light noun, though it would be difficult to independently confirm the correctness of this assumption. Thirdly, if *-m* gerunds involve ordinary, noun-modifying relatives, then it is difficult to see why they disallow instrumental subjects: in the approach outlined in (64) and (65) the participles are expected to have identical internal properties. Finally, this approach also falls short of explaining why verbal gerunds in object position must be marked with overt accusative case. Udmurt is a DOM language, with indefinite/non-specific objects being unmarked. The obligatory accusative suffix on gerunds is predicted on the mixed projection analysis advanced above, since their structure necessarily includes a DP (cf. also Ótrott-Kovács 2016 on Kazakh).

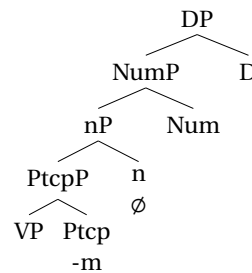
5.3 RNs

Turning to result nouns, we have seen that they exhibit the internal syntax of nouns, including the possibility of pluralization as well as adjectival and demonstrative modification. Under the mixed projection analysis of verbal gerunds we attributed the lack of such nouny properties to an indirect nominalization structure (66), in which there is no nominalizer proper in the structure. Thus in the mixed projection analysis RNs would be best treated as direct nominalizations of PtcpP (67).

(66) Verbal gerund



(67) Result noun



The nominalizer in (67) allows for the emergence of nominal modifiers. The *-m* suffix attaches directly to VP. On the assumption that arguments are licensed by higher functional structure, this accounts for the fact that RNs do not have arguments. In (67) the small verbal structure of RNs correlates with their large nominal layer. In gerunds, on the other hand, we observe the reverse situation: rich verbal structure and only one nominal projection. This trade-off between the size of the nominal and verbal layers is predicted by Alexiadou et al.'s (2010) proposal that AspP and NumP (hosting the plural marker) are in complementary distribution in nominalizations. (See also Wiltschko 2014, where verbal aspect and nominal

¹⁸Aygen (2011) proposes that nominalizations similar to Udmurt gerunds in Modern Standard Turkish also contain a covert head noun. Crucially, however, agreement in MST RCs is marked on the participial verb, and not on the head noun, in contrast to Udmurt. We will leave open the question of the (cross-linguistic) variation between these patterns.

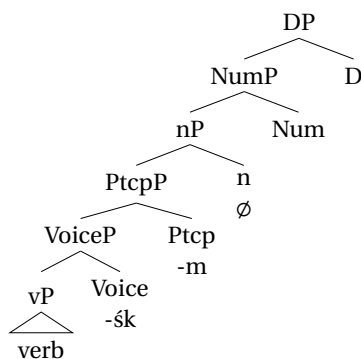
plurality both code ‘point of view’.)

While (67) could be a plausible analysis of result nouns in general, this clearly cannot be the whole story in the case of Udmurt. In 3.2 we have seen that certain RNs can feature the intransitivizing/anticausative *-šk* voice morpheme or the *-t* (external) causative suffix.¹⁹ These RNs must be bigger than RootP. The following examples are from Kirillova’s (2008) dictionary.

- (68) piž-išk-em, bas’a-s’k-em
bake-INTR-m, buy-INTR-m
‘pastry, goods/purchase’
- (69) a. kīn-t-em, pīrgi-t-em, sul’a-t-em
frost-CAUS-m, crumb-CAUS-m, bake/fry/melt-CAUS-m
‘ice-cream, a type of sauerkraut, a type of omelette’
b. beṭ’īr-t-em, žal’tīr-t-em, džil’īr-t-em, džabīl’-t-em
IDEO-CAUS-m, IDEO-CAUS-m, IDEO-CAUS-m, IDEO-CAUS-m
‘babbling/prattling, strumming, twitting/strumming, splashing/chirp’

The intransitivizing/anticausative and the external causative morpheme have in common that they alter the argument structure of the base verb by removing or adding arguments. As shown in (26a), verbal morphology that operates on top of a full argument structure, e.g. frequentative morphology, is illicit with RNs. In order to accommodate *-šk* and *-t*, we might envisage a structure that contains a VoiceP or CauseP (70).

- (70) Rejected structure for result nouns



If however, we allow for RNs to contain a larger chunk of verbal structure, then it becomes impossible to exclude the appearance of arguments or adverbial modifiers.

As the mixed projection analysis of RNs either cannot accommodate the argument structure changing morphology (67), or it wrongly predicts argument structure and adverbial modification (70), it is worth exploring the alternative whereby RNs arise from a PtcpP modifying a covert noun. As was mentioned in section 5.2, Udmurt nouns do not take PtcpP complements, therefore an analysis with a covert N is plausible only if the PtcpP is a relative modifier:

- (71) [FP [PtcpP verb-m] [F [NP covert N]] ‘RN’ (relative with a covert head)

One of the reasons why something like (71) was not attractive for verbal gerunds was that the posited covert N does not alternate with overt Ns. In the case of RNs, however, we do attest

¹⁹The *-šk* suffix is investigated in detail in Kozmács (2008) and Tánčzos (2017). On the *-t* morpheme see Tánčzos (2016).

this alternation: the nouns following the *-m* forms in (72) can be omitted without a change in meaning.

- (72) a. kul-em ~ kul-em murt; mertć-em ~ mertć-em pu
 die-m die-m person sink-m sink-m wood
 ‘dead person’ ‘splinter’
 b. piž-išk-em ~ piž-išk-em make ~ piž-em make
 bake-INTR-m bake-INTR-m thing bake-m thing
 ‘pastry’
 c. kɨn-t-em ~ kɨn-t-em jel
 frost-CAUS-m frost-CAUS-m milk
 ‘ice-cream’

Numerous similar examples are also listed in Kalinina (2001:26–31, where they are treated as the juxtaposition of a deverbal noun and a noun). The nouns that co-occur with RNs in her examples can be grouped semantically into time and place-denoting nouns as well as abstract nouns such as ‘mood’, ‘reason’, ‘manner/way’, etc.

This makes the analysis of RNs in terms of an underlying RC structure more plausible than in the case of gerunds. If RNs involve underlying RCs, then we can also accommodate the intransitivizing/anticausative and the external causative morpheme: we have seen that this morphology is licit in RCs (39b). Although the overt nouns in (72) and in Kalinina’s (2001) examples are semantically light, syntactically they behave like garden-variety nouns: they allow for pluralization, adjectival modification, etc. If their covert counterparts share these grammatical properties and the difference mainly concerns exponence (which is what we attest with Uyghur covert nouns, cf. Asarina & Hartman 2011), then the nouny properties of RNs are also correctly predicted.

(71), however, does not straightforwardly account for the fact that RNs reject frequentative morphology, adverbial modification and the expression of the base verb’s subject argument as an instrumental PP. As shown in 5.1, ordinary RCs have these properties (because they allow a large verbal constituent under *-m*). In other words, the posited covert nouns seem to correlate with the lack of arguments and modifiers within the relative clause.

We propose that RNs which contain the intransitivizing/anticausative or the external causative morpheme as well as those which optionally modify another N (such as those in (72) and the ones listed in Kalinina 2001), regardless of whether they contain Voice/Cause morphology, are indeed RCs of some sort. If an RC+N combination is frequently used (e.g. because this specific collocation names an everyday household object, a traditional food item or an object connected to regularly recurring activities), then this combination can develop a conventionalized meaning, which can ultimately lead to a shortening of the phrase by dropping the head noun (which, we have seen, is often semantically quite light anyway). Examples such as *džoktem* lit. spooled ‘ball of yarn’, *sul’atem* lit. baked ‘omelette’, *kɨntem* lit. frozen ‘ice-cream’, *kulem* lit. dead ‘dead person’, *pirgitem* lit. chopped ‘chopped and pickled cabbage’, *kilem* lit. left ‘leftovers’ etc. are, in our view, outputs of this process.²⁰ A conventionalized meaning can emerge and the RC+N combination can function as a generic name of a kind when the semantic content of the RC is general enough to allow this, that is, it does not contain any modifiers that would lead to an episodic reading. An overtly expressed instrumental subject, an adverbial modifier or the frequentative morphology will usually lead to an episodic reading, and so the N modified by such an RC will refer to a particular object

²⁰Over time, these short RCs with a covert head can grammaticalize into regular, morphologically non-decomposable nouns.

in the world.²¹ That is, these modifiers are perfectly licit in RCs, including RCs projected by the base-verb of RNs, but the modified noun will not have a general, kind-denoting meaning in their presence, and therefore it will not be omissible either.

While we take RNs with the intransitivizing/anticausative or the external causative morpheme and RNs freely juxtaposed to other nouns to be RCs in disguise, we leave open the possibility that other RNs (comprising just the base verb plus *-m* and not appearing in the juxtaposed construction) are mixed projections along the lines of (67). In section 3.3 we discussed RNs derived from intransitive verbs. As they do not feature voice and causative morphology and they are more transparent semantically than the ones discussed in this section, it might be the case that these RNs instantiate the direct nominalization structure depicted in (67). If this is on the right track, then it might turn out that RNs in Udmurt have different underlying structures. We leave this question open for future research.

6 Conclusion

The central problem addressed in this paper was how to capture the cross-linguistically widespread participle-nominalization polysemy in a principled, structure-based account. We outlined three ways to unify participles and nominalizations which share the same suffix, and as a case study, we explored which of these is most suitable to capture the facts in Udmurt. We discarded the possibility of analyzing the suffix *-m* of participles and nominalizations as a nominalizer, and concluded that this suffix is a verbal head, with gerunds involving mixed projections. Although still refinable in various ways, our proposal can serve as a basis on which to attempt a non-stipulative approach to the participle-nominalization polysemy in other languages as well.

²¹The object of the participial verb will not appear within the RC either, as the object corresponds to the overt or covert head noun and it is therefore necessarily unexpressed in the RC.

References

- Abney, Steven. 1987. *The English noun phrase in its sentential aspect*: MIT dissertation.
- Ackerman, Farrell & Irina Nikolaeva. 2013. *Descriptive typology and linguistic theory: a study in the morphosyntax of relative clauses*. Standord, CA: CSLI Publications.
- Alexiadou, Artemis. 2001. *Functional structure in nominals: nominalization, and ergativity*. Amsterdam: John Benjamins.
- Alexiadou, Artemis. 2013. Nominal vs. verbal *-ing* constructions and the development of the English progressive. *English Linguistics Research* 2(2). 126–140.
- Alexiadou, Artemis. 2020. D vs. n nominalizations within and across languages. In Artemis Alexiadou & Hagit Borer (eds.), *Nominalizations: 50 years on from Chomsky's Remarks*, Oxford: Oxford University Press.
- Alexiadou, Artemis, Gianina Iordăchioaia, Mariangeles Cano and Fabienne Martin & Florian Schäfer. 2013. The realization of external arguments in nominalizations. *Journal of Comparative Germanic Linguistics* 16(2). 73–95.
- Alexiadou, Artemis, Gianina Iordăchioaia & Florian Schäfer. 2011. Scaling the variation in Romance and Germanic nominalizations. In Harry Perridon & Petra Sleeman (eds.), *The noun phrase in Romance and Germanic: Structure, variation and change*, 25–40. Amsterdam & Philadelphia: John Benjamins.
- Alexiadou, Artemis, Gianina Iordăchioaia & Elena Soare. 2010. Number/aspect interactions in the syntax of nominalizations: A Distributed Morphology approach. *Journal of Linguistics* 46(3). 537–574.
- Arad, Maya. 1996. A minimalist view of the syntax-lexical semantics interface. *UCL Working Papers in Linguistics* 8. 1–30.
- Asarina, Alya & Jeremy Hartman. 2011. Uyghur Genitive Subjects and the Phase Impenetrability Condition. In Andrew Simpson (ed.), *Proceedings of the 7th Workshop on Altaic Formal Linguistics (WAFL7)* (MIT Working Papers in Linguistics 62), 17–31. Cambridge, MA: MITWPL.
- Assmann, Anke, Svetlana Edygarova, Doreen Georgi, Timo Klein & Philipp Weisser. 2014. Case Stacking below the surface: On the possessor case alternation in Udmurt. *The Linguistic Review* 31(3–4). 447–485.
- Aygen, Gulsat. 2011. Reduced relatives and the location of agreement. *California Linguistic Notes* XXXVI(1).
- Baker, Mark C. 2011. Degrees of nominalization: clause-like constituents in Sakha. *Lingua* 121. 1164–1193.
- Borer, Hagit. 1997. The morphology-syntax interface: a study of autonomy. In Wolfgang U. Dressler, Martin Prinzhorn & John Rennison (eds.), *Advances in morphosyntax* (Trends in Linguistics, Studies and Monographs 97), 5–30. The Hague: Mouton de Gruyter.
- Borer, Hagit. 2013. *Structuring sense. Volume 3. Taking form*. Oxford: Oxford University Press.
- Borer, Hagit. 2020. The V of de-verbal nominals: PROs and Cons. In Artemis Alexiadou & Hagit Borer (eds.), *Nominalizations: 50 years on from Chomsky's Remarks*, Oxford: Oxford University Press.
- Borsley, Robert D. & Jaklin Kornfilt. 2000. Mixed extended projections. In Robert D. Borsley (ed.), *The Nature and Function of Syntactic Categories*, 101–131. Leiden: Brill.
- Bowers, John. 1993. The syntax of predication. *Linguistic Inquiry* 24(4). 591–656.
- Brykina, Maria & Natalia Aralova. 2012. Sistemy prichastii v marijskom i permskih yazykah. In Ariadna I. Kuznecova (ed.), *Finno-ugorskie jazyki: fragmenty grammatich-*

- eskogo opisanija. *Formal'nyj i funkcional'nyj podxody*, 476–521. Moskva: Rukopisnye pamjatniki drevnej Rusi.
- Collins, Chris. 2005. A smuggling approach to the passive in English. *Syntax* 8(2). 81–120.
- Coon, Jessica & Justin Royer. 2020. Nominalization and selection in two Mayan languages. In Artemis Alexiadou & Hagit Borer (eds.), *Nominalizations: 50 years on from Chomsky's Remarks*, Oxford: Oxford University Press.
- Dékány, Éva & Orsolya Tanczos. 2017. The structure of the Udmurt past participle. Talk given at BLINC 2, Budapest: ELTE, June 2017.
- Dikken, Marcel den. 2015. Raising the Subject of The “Object-Of” Relation. In Ángel J. Gallego & Dennis Ott (eds.), *MIT Working Papers in Linguistics 77. 50 Years Later: Reflections on Chomsky's Aspects*, 85–98. Cambridge, MA: MIT Press.
- Doron, Edit & Chris H. Reintges. 2005. On the syntax of participial modification. Ms., Hebrew University of Jerusalem.
- Edygarova, Svetlana. 2010. *Kategorija posessivnosti v udmurtskom jazyke*: University of Tartu dissertation.
- F. Gulyás, Nikolett & Yulia Speshilova. 2014. Impersonals and passives in contemporary Udmurt. *Finnisch-Ugrische Mitteilungen* 38. 59–91.
- Fu, Jungqi, Hagit Borer & Tom Roeper. 2001. The VP within nominalizations: evidence from adverbs and the VP anaphor *do so*. *Natural Language and Linguistic Theory* 19(3). 549–582.
- Georgieva, Ekaterina. 2018. *Non-finite adverbial clauses in Udmurt*: University of Szeged dissertation.
- Georgieva, Ekaterina & Eszter Ótót-Kovács. 2016. Nem véges alárendelői mellékmondatok a Volga-vidéki nyelvi areában. In Zsuzsanna Gécseg (ed.), *LingDok 15*, 51–67. Szeged: Szegedi Tudományegyetem.
- Georgieva, Ekaterina & Eszter Ótót-Kovács. 2017. Syntactic similarities between non-finite clauses in Udmurt and Tatar? Ms., Research Institute for Linguistics, Hungarian Academy of Sciences & Cornell University.
- Grimshaw, Jane. 1990. *Argument structure*. Cambridge, MA: MIT Press.
- GSUJa I. 1962. *Grammatika sovremennogo udmurtskogo jazyka. I. Fonetika i morfologija*. Izhevsk: Udmurtia.
- Hale, Ken. 2002. On the Dagur Object Relative: Some Comparative Notes. *Journal of East Asian Linguistics* 11(2). 109–122.
- Hale, Ken & Samuel Jay Keyser. 1993. On the argument structure and the lexical expression of syntactic relations. In Ken Hale & Samuel Jay Keyser (eds.), *The view from building 20: Essays in linguistics in honor of Sylvain Bromberger*, 53–109. Cambridge, MA: MIT Press.
- Kalinina, Lyudmila I. 2001. *Prichastija i prichastnyje konstrukcii v udmurtskom jazyke*. Izhevsk: Izdatelskij dom Udmurtskij universitet.
- Kel'makov, Valentin & Sara Hännikäinen. 1999. *Udmurtin kielioppia ja harjoituksia*. Helsinki: Suomalais-Ugrilainen Seura.
- Kim, Min-Jo. 2009. E-type anaphora and three types of *kes*-construction in Korean. *Natural Language and Linguistic Theory* 27(2). 345–377.
- Kirillova, Lyudmila E. (ed.). 2008. *Udmurtsko-russkij slovar*. Izhevsk: Udmurtskiy Institut istorii, jazyka i literatury Ural'skogo otdeleniya Rossiyskoy akademii nauk.
- Klumpp, Gerson. 2016. Semantic functions of complementizers in Permic languages. In Kasper Boye & Petar Kehayov (eds.), *Complementizer semantics in European Languages* (Empirical Approaches to Language Typology 57), 529–586. Berlin & Boston: Mouton de Gruyter.
- Koptjevskaja-Tamm, Maria. 1993. *Nominalizations*. London: Routledge.

- Kornfilt, Jaklin. 2001. On the syntax and morphology of clausal complements and adjuncts in the Turkic languages. In Walter Bisang (ed.), *Aspects of typology and universals*, 63–82. Berlin: Akademie Verlag.
- Kornfilt, Jaklin. 2003. Subject case in Turkish nominalized clauses. In Uwe Junghanns & Luka Szucsich (eds.), *Syntactic structures and morphological information*, 129–216. Berlin & Boston: Mouton de Gruyter.
- Kornfilt, Jaklin. 2005. Agreement and its placement in Turkic nonsubject relative clauses. In Guglielmo Cinque & Richard S. Kayne (eds.), *The Oxford Handbook of Comparative Syntax*, 513–541. Oxford: Oxford University Press.
- Kornfilt, Jaklin. 2015. Turkish relative clauses: how exceptional are they from a Central Asian Turkic perspective? In Öner Özçelik & Amber Kennedy Kent (eds.), *Proceedings of the 1st Conference on Central Asian Languages and Linguistics (ConCALL -1) vol. 1*, 3–24. Indiana University: CeLCAR.
- Kornfilt, Jaklin & John Whitman. 2011. Introduction: Nominalizations in syntactic theory. *Lingua* 121(7). 1160–1163.
- Kozmács, István. 2008. *Az -šk- képző az udmurt (votják) igeképzés rendszerében [The -šk suffix in the verbal derivation system of Udmurt]*. Nitra: Univerzita Konštantína Filozofa.
- Kratzer, Angelika. 1996. Severing the external argument from its verb. In Jonathan Rooryck & Laurie Ann Zaring (eds.), *Phrase structure and the lexicon*, 109–137. Dordrecht: Springer.
- Lyutikova, Ekaterina & Dilya Ibatullina. 2015. Case theory and case variation in Tatar. In Ekaterina Lyutikova, Anton Zimmerling & Mariya Konoshenko (eds.), *Tipologiya morfos-intakticheskikh parametrov 2015*, 226–242. Moskva: MGU.
- Maki, Hideki & Asako Uchibori. 2008. Ga/No conversion. In Shigeru Miyagawa & Mamoru Saito (eds.), *The Oxford Handbook of Japanese Linguistics*, 192–216. Oxford: Oxford University Press.
- Moulton, Keir. 2014. Simple event nominalizations: Roots and their interpretation. In Ileana Paul (ed.), *Cross-linguistic Investigations of Nominalization Patterns* (Linguistik Aktuell/Linguistics Today 210), 119–144. Amsterdam: John Benjamins.
- Moulton, Keir. 2020. Remarks on propositional nominalization. In Artemis Alexiadou & Hagit Borer (eds.), *Nominalizations: 50 years on from Chomsky's Remarks*, Oxford: Oxford University Press.
- Nikolaeva, Irina. 1999. *Ostyak* (Languages of the world materials 305). Muenchen: Lincom Europa.
- Noonan, Michael. 1997. Versatile nominalizations. In Joan Bybee, John Haiman & Sandra A. Thompson (eds.), *Essays on Language Function and Language Type. Dedicated to T. Givón*, 373–394. Amsterdam: John Benjamins.
- Ótót-Kovács, Eszter. 2016. *The syntax of non-finite clauses in Kazakh*. University of Szeged dissertation.
- Ótót-Kovács, Eszter. 2019. Genitive-marked subjects in Kazakh relative clauses. Talk at Workshop on Altaic Formal Linguistics 15, Lomonosov Moscow State University, September 2019.
- Sahan, Fatma. 2002. *Nominal clauses in Kazan Tatar*. University of Wisconsin-Madison dissertation.
- Serdbobolskaya, Natalia V., Anfisa A. Ilyevskaya, Sergey A. Minor, Polina S. Miteva, Aleksandra V. Fainveits & Natalia S. Matveeva. 2012. Konstrukcii s sentencial'nymi aktantami v finno-ugorskix jazykax. In Ariadna I. Kuznetsova (ed.), *Finno-ugorskie jazyki: fragmenty grammaticheskogo opisaniya. Formal'nyj i funkcional'nyj podxody* (Studia Philologica), 382–476. Moskva: Rukopisnye pamyatniki drevney Rusi.

- Serdobolskaya, Natalia & Denis Paperno. 2006. The polysemy of relativizing and nominalizing markers. Ms., Moscow Municipal University for Psychology and Pedagogics & Moscow State University.
- Shagal, Ksenia. 2018. Participial systems in Uralic languages: an overview. *ESUKA - JEFUL* 9(1). 55–84.
- Sichel, Ivy. 2010. Event Structure Constraints in Nominalization. In Artemis Alexiadou & Monika Rathert (eds.), *The Syntax of Nominalizations across Languages and Frameworks*, 159–198. Berlin: Mouton de Gruyter.
- Starchenko, Aleksey. 2019. Periphrastic nominalization in Kazym Khanty. Talk at Syntax of Uralic Languages 3, Tartu, June 2019.
- Tánczos, Orsolya. 2016. *Causative construction and their syntactic analysis in the Udmurt language*: Pázmány Péter Katolikus Egyetem dissertation.
- Tánczos, Orsolya. 2017. The antipassive -*šk*- in Udmurt: a preliminary study. Ms., Research Institute for Linguistics, Hungarian Academy of Sciences.
- Williams, Edwin. 1981. Argument Structure and Morphology. *The Linguistic Review* 1(1). 81–114.
- Wiltschko, Martina. 2014. *The universal structure of categories. Towards a formal typology* (Cambridge Studies in Linguistics). Cambridge: Cambridge University Press.
- Winkler, Eberhard. 2001. *Udmurt* (Languages of the world materials 212). Muenchen: Lincom Europa.