

Attributive Compounds in Lithuanian: a DM approach

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1 Introduction

- This study explores the properties of attributive noun-noun (N-N) compounds in Lithuanian.
- Attributive compounds are endocentric compounds that consists of a non-head (some kind of modifier) e.g., *tennis*, and a head e.g., *ball*, as in (1) (Ingason and Sigurðsson 2020).

(1) *tennis ball* (a ball for playing tennis)

- Lithuanian attributive N-N compounds are very productive. They involve the combination of two bases (simple or derived): the first part of the compound (the non-head) modifies the second part (the head):

(2)	a. duon-a bread.F-NOM.SG 'bread' (Class II.a)	b. maiš-as bag.M-NOM.SG 'a bag' (Class I.a) →	c. duon-maiš-is bread-bag.M-NOM.SG 'a bag for bread' (Class I.b)
(3)	a. sod-as garden.M-NOM.SG 'a garden' (Class I.a)	b. viet-a place.F-NOM.SG 'a place' (Class II.a) →	c. sod-viet-ė garden-place.F-NOM.SG 'a place for a garden' (Class II.b)

- A striking feature of all Lithuanian N-N compounds is that the gender feature of the head is **retained** whereas the inflectional class is **lost**.¹

→ **GENDER**

- If the head of the compound is **masculine**, then the entire compound is **masculine** (2).
- If the head of the compound is **feminine**, then the entire compound is also **feminine** (3)

→ **INFLECTIONAL CLASS**

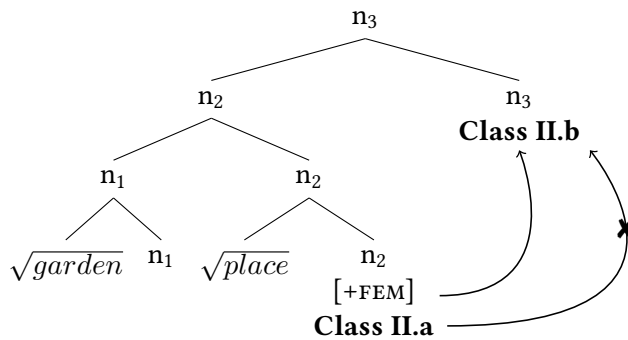
- All masculine compounds will have **(Class I.b)** regardless of the inflectional class of the head
- All feminine compounds will have **(Class II.b)** regardless of the inflectional class of the head

¹Jordächioaia et al. 2017 note that Greek compounds can also be assigned a new inflectional class e.g., *spít-i* 'house' to *kuklóspít-o* 'doll house'. Also see Lieber 1992:80-86, Dressler and Barbaresi 2011:94-95 showing that diminutives in Italian preserve gender, but the class feature is lost.

Proposal:

- (i) Lithuanian N-N compounds are morphologically complex: the non-head and the head are categorized, as opposed to root-root compounds (e.g., Iordăchioaia et al. 2017; Steddy 2019; Ingason and Sigurðsson 2020), and then crowned by a higher n_3 head.
- (ii) **Highest Gender Wins (Kramer 2015:218):** n bears gender features. In the case of multiple n s, “the gender of the highest n is the agreeing gender of the nominal.”
 - In Lithuanian compounds n_2 determines the gender rather than n_3 , which has important consequences for PIC.
- (iii) Unlike gender features, class features in Lithuanian are subject to strict local adjacency (in line with Gouskova and Bobaljik to appear)
 - The class features of n_2 do not count for percolation/concord algorithm
 - The compound is assigned either Classes I.b (MASC nouns) or II.b (FEM nouns), which are default for nouns with palatalized stem-final consonants.

- (4) sod-viet-ė
 garden-place.F-NOM.SG
 ‘a place for a garden’ (Class II.b)



- Road map
 - Section 2 Basic Properties of Lithuanian Noun Inflection
 - Section 3 Head vs. non-head
 - Section 4 Analysis

2 Basic Properties of Lithuanian Noun Inflection

- This goal of this section is to introduce the basic properties of noun inflection in Lithuanian and to show that the classes I.b and II.b (observed in all compounds) are the default classes for nouns with a specific base type.
- Lithuanian nouns have inherent masculine or feminine *gender* and inflect for *number* and *case*, using mostly cumulative exponents:

- | | | | |
|-----|------------------------------|------------------------------|------------------------------|
| (5) | a. sod-as
garden.M-NOM.SG | b. sod-o
garden.M-GEN.SG | c. sod-ui
garden.M-DAT.SG |
| (6) | a. duon-a
bread.F-NOM.SG | b. duon-os
bread.F-GEN.SG | c. duon-ai
bread.F-DAT.SG |

- Based on how they inflect, Lithuanian nouns are divided into five inflectional classes. A summarizing table of the inflectional classes is presented below. The inflectional exponents and the theme vowels are separated for convenience (Ambrazas et al. 1997):

(7) *The inflectional classes of Lithuanian nouns:*

	I.a	I.b	II.a	II.b	III	IV	V
N.Sg	-a-s	-i/y-s	-a-Ø	-ė-Ø	-i-s	-u-s	-uo
G.Sg	-Ø-o	-Ø-o	-o-s	-ė-s	-ie-s / -Ø-s	-au-s	-Ø-s
D.Sg	-Ø-ui	-Ø-ui	-a-i	-e-i	-i-ai (-i-ui (m))	-Ø-ui	-i-ui (-i-ai (f))
A.Sg	-a-μ	-i-μ	-a-μ	-e-μ	-i-μ	-u-μ	-i-μ
I.Sg	-Ø-u	-Ø-u	-a-Ø	-e-Ø	-i-mi	-u-mi	-i-u (-i-mi (f))
L.Sg	-Ø-e	-y-e	-o-e	-ė-e	-y-e	-u-e	-y-e
V.Sg	-Ø-e	-i-Ø	-a-Ø	-e-Ø	-ie-Ø	-au-Ø	-ie-Ø
N/V.Pl	-a-i	-a-i	-o-s	-ė-s	-y-s	-ū-s	-y-s
G.Pl	-Ø-ų	-Ø-ų	-Ø-ų	-Ø-ų	-(i)-ų	-Ø-ų	-Ø-ų
D.Pl	-a-ms	-a-ms	-o-ms	-ė-ms	-i-ms	-u-ms	-i-ms
A.Pl	-Ø-us	-Ø-us	-a-s	-e-s	-i-s	-u-s	-i-s
I.Pl	-a-is	-a-is	-o-mis	-ė-mis	-i-mis	-u-mis	-i-mis
L.Pl	-Ø-uose	-Ø-uose	-o-se	-ė-se	-y-se	-Ø-uose	-y-se

- Inflectional class strongly correlates with gender (items marked in gray come from very small groups of items, esp. in Classes II.b and V):

(8) *The gender-class distribution:*

	I	II	III	IV	V
M	rat-as 'wheel' mol-is 'clay'	Alekn-a (male l.name) dėd-ė 'uncle'	žvėr-is 'beast'	turg-us 'market'	vand-uo 'water'
F	-	vapsv-a 'wasp' up-ė 'river'	nakt-is 'night'	-	ses-uo 'sister'

2.1 Classes I and II are default in Lithuanian!

- We saw above that all compounds belong to Class I if masculine and Class II if feminine. In this subsection, we show that Classes I and II are the default (=unmarked) inflectional classes in Lithuanian.
- The inflectional classes III, IV and V are the legacy types inherited from Proto-Baltic. The actually productive classes are Class I and Class II:

– Nearly all newly created and borrowed nouns are assigned Class I or II depending on gender:

- (9) a. I.a: Niujork-as 'New York', džaz-as 'jazz'
 b. I.b: kompiuter-is 'computer', geimer-is 'gamer'²
 c. II.a: konstitucij-a 'constitution', respublik-a 'republic'
 d. II.b: doz-ė 'dose'

– When nouns of Classes III/IV/V are used as the first element in a compound, the linker might be the theme vowel of the respective class or be simplified to the linker of I/II -

- (10) a. ugn-i-kaln-i-s
 fire-**TH.III**-mountain-**TH.IB-NOM.SG**
 'volcano (~ fire mountain)'

²Most foreign items go to Class I.a when masculine, but Germanic and Romance stems ending in the agentive /-r/ are usually palatalized and classified as I.b: plejeris 'player', treneris 'trainer', likeris 'liquor'.

- b. ugni-**a**-viet-**è**- \emptyset
 fire-**TH.IIA**-place-**TH.IIB**- \emptyset
 ‘fireplace’

- but nouns belonging to Classes I and II can never use the theme vowels of more complex classes (/i-/ (III/V) or /u-/ (IV)) as linkers (see Fenger and Harðarson 2020):

- (11) a. up-**è**-tak-i-s
 river-**TH.IIB**-run/flow-**TH.IB**-**NOM.SG**
 ‘trout (~ river runner)’
 b. *up-**i**-??? → impossible
 river-**TH.III**

- In the table in (7), Classes I and II have two subclasses each: *a* and *b*.

☞ The inflectional endings in the Classes I.a/b and II.a/b respectively are largely identical (except for voc.SG in Class I). The only difference is the theme vowel in the singular for Class I and the theme vowel in both numbers for Class II.

(12) *Identical suffixes and (partially) different theme vowels within Class I:*

	Nom.Sg	Gen.Sg	Dat.Sg	Acc.Sg	Dat.Pl
I.a	rat-a-s	rat- \emptyset -o	rat- \emptyset -ui	rat-a- ^u	rat-a-ms
I.b	mol-i-s	moli- \emptyset -o	moli- \emptyset -ui	mol-i- ^u	moli-a-ms

(13) *Identical suffixes and different theme vowels within Class II:*

	Nom.Sg	Gen.Sg	Dat.Sg	Instr.Sg	Dat.Pl
II.a	vapsv-a- \emptyset	vapsv-o-s	vapsv-a-i	vapsv-a- \emptyset	vapsv-o-ms
II.b	up- è - \emptyset	up- è -s	up-e-i	up-e- \emptyset	up- è -ms

- All nouns in Classes I.b and II.b have a palatalized stem-final consonant, even if the theme vowel is deleted or is underlyingly /a/ ([æ] in the SR):

- (14) **I.b:** brolis [brɔ:lʲ-i-s] (NOM.SG), broliams [brɔ:lʲ-æ-ms] (DAT.PL), brolių [brɔ:lʲ- \emptyset -u:] (GEN.PL)
II.b: upė [ʊpʲ-eɪ- \emptyset] (NOM.SG), upės [ʊpʲ-eɪ-s] (GEN.SG), upių [ʊpʲ- \emptyset -u:] (GEN.PL),

- Nearly all nouns in Classes I.a and II.a have a non-palatalized stem-final consonant.

- (15) **I.a:** maišas [mɛiʃ-a-s] (NOM.SG), maišams [mɛiʃ-a-ms] (DAT.PL), maišų [mɛiʃ- \emptyset -u:] (GEN.PL)
II.a: vieta [vʲiɛt-a- \emptyset] (NOM.SG), vietos [vʲiɛt-oɪ-s] (GEN.SG), vietų [vʲiɛt- \emptyset -u:] (GEN.PL),

- The existing exceptions constitute a very small group:

- (16) vėjas (wind, I.a), žinia (news, II.a), kelias (road, I.a)

☞ The evidence suggests that the Classes I.b and II.b are the default classes for masculine and feminine nouns with stem-final consonants specifically bearing the dorsal feature [-bk] within the greater default Classes I and II.

- Lithuanian compounds always belong to Classes I.b and II.b. We believe this to be the case because:

- Every Lithuanian compound stem has a palatalized stem-final consonant. Why this is the case is elaborated upon in Section 3 below;
- Compounds do not inherit the inflectional class of the head and switch to the default inflectional class instead.

(17) *The palatalization of stems in Lithuanian compounds:*

	GEN.PL	GEN.PL
maiš-as ‘bag’	maiš-ų	šien-maiši-ų
turg-us ‘market’	turg-ų	sen-turgi-ų
akm-uo ‘stone’	akmen-ų	brang-akmeni-ų
mokykla ‘school’	mokykl-ų	šun-mokykli-ų [-kʲɪʊ:]

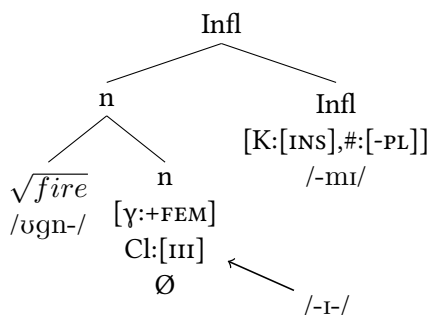
2.2 Assumptions about Inflectional Class in Minimalism

- Following Fenger and Harðarson (2020) and Embick (2010), we assume that inflectional class features are semantically void and therefore fully abstract.
- Crucially, they cannot be targeted by agreement or percolate up the tree.
- According to Kramer (2015), roots do not contain gender features, which are supplied by the categorizing nominal head *n*. We assume that class features are also a component of the n-head. Thus, nominal roots in Lithuanian are selected for by phonologically null n-heads in the following manner:
- According to Gouskova and Bobaljik to appear, declension class in Russian is associated with exponents rather than with underlying abstract morphemes. Class is not predictable from gender (at least for a few classes), or from a phonology of a specific head. Declension class is not a morphosyntactic feature, but is instead a part of morphophonological system. Steriopolo (2008) treats gender features and declension class as diagnostics for head status whereas Gouskova and Bobaljik to appear disagree.

- (18) a. $n [\bullet, \sqrt{\bullet}, \gamma: [-FEM], Cl: [I]]$ where $\sqrt{\bullet} \in \{\sqrt{garden}, \sqrt{leaf}, \sqrt{table} \dots\}$
 b. $n [\bullet, \sqrt{\bullet}, \gamma: [+FEM], Cl: [II]]$ where $\sqrt{\bullet} \in \{\sqrt{place}, \sqrt{day}, \sqrt{storm} \dots\}$
 c. $n [\bullet, \sqrt{\bullet}, \gamma: [-FEM], Cl: [II]]$ where $\sqrt{\bullet} \in \{\sqrt{PN} : Alekna \dots\}$
 d. ...

- Class features influence the exponence of case and number contextually and provide theme vowels. Following Embick (2010), the theme vowel is tucked in last:

(19)



3 Complex structure of compounds

- In this section, we show that the second element of the compound is the head both in terms of its morphosyntactic behavior and semantic properties whereas the first element is a non-head (a modifier).

‘flour’ (Class I.a-sg) c. duon-a bread.F-NOM.SG ‘bread’ (Class II.a-pl)

- (29) a. duon-milči-ai bread-flour.M-NOM.PL ‘flour for bread’, ‘bread flour’ (Class I.b - pl)
- b. *duon-milt-is bread-flour.M-NOM.SG ‘flour for bread’, ‘bread flour’ (Class I.b - sg)

- There is a group of nouns that are called *singularia tantum*. These nouns have only a singular form e.g., like *pienas* ‘milk.NOM.M.SG’. Thus, the compound will also be inflected like a singular noun.

(30) pien-as milk.M-NOM.SG ‘milk’

(31) *pien-ai milk.M-NOM.PL ‘milk’

(32) žiurk-pien-is rat-milk.M-NOM.SG ‘rat milk’

(33) *žiurk-pien-iai rat-milk.M-NOM.PL ‘rat milk’

- Some nouns can be either singular or plural e.g., in (34) both *šienas* ‘hay’ and *maišas* ‘bag’ can also be plural and thus the compound can also be either plural or singular:

(34) a. šien-maiš-is hay-bag.M-NOM.SG ‘a bag for putting hay’ (Class I.b)

b. šien-maiš-iai hay-bag.M-NOM.PL ‘bags for putting hay’ (Class I.b)

3.3 Gender and number features vs. inflectional class

- We have seen that the head, as opposed to a non-head, determines the gender and number features of the entire compound.
- While features like gender are retained, the original inflectional class of the head is lost. This applies to all attributive compounds across the board (regardless of the class feature of the head).

– All masculine compounds will have (Class I.b) regardless of the inflectional class of the head.

(35) a. duon-a bread.F-NOM.SG ‘bread’ (Class II.a)

b. maiš-as bag.M-NOM.SG ‘a bag’ (Class I.a)

c. duon-maiš-is bread-bag.M-NOM.SG ‘a bag for bread’ (Class I.b)

– All feminine compounds will have (Class II.b) regardless of the inflectional class of the head

(36) a. sod-as garden.M-NOM.SG ‘a garden’ (Class I.a)

b. viet-a place.F-NOM.SG ‘a place’ (Class II.a)

c. sod-viet-ė garden-place.F-NOM.SG ‘a place for a garden’ (Class II.b)

- As argued in Section 2, Class I.b and Class II.b are default.
→ Compounds are assigned default Classes, but not default gender, which is masculine in Lithuanian (Holvoet and Semėnienė 2006; Adamson and Šreikaitė 2019).

3.4 Semantic Properties

- The head is a hyponym of the compound. The head can be determined by the semantic IS A test (Allen 1978).³

(37) A tennis ball IS A ball.

(38) duon-maiš-is yra maišas
bread-bag.M-NOM.SG is bag
'a bag for bread is a bag'

(40) maist-pinig-iai yra pinigai
food-money.NOM-M.PL is money
'money for buying food is money'

(39) sod-viet-ė yra vieta
garden-place.F-NOM.SG is place
'a place for a garden is a place'

(41) bazd-a-šuk-ės yra šukos
beard-L-comb.F-NOM.PL is comb
'a comb for a beard is a comb'

- The semantic relation between the two elements is asymmetric.⁴
- The non-head element is a modifier, it does not saturate an argument position required by the event described by the head as the non-head of the synthetic compound does cf. (44) and (45). This may suggest that a non-head element in (44) does not function like a complement.

(42) tennis ball
(attributive compound)

(43) meat eater
(synthetic compound)

(44) duon-maiš-is
bread-bag.M-NOM.SG
'a bag for bread' (attributive)

(45) mės-os valgy-toj-as
meat.F-NOM.SG eat-AG-NOM.M.SG
'a meat eater' (synthetic)

- The synthetic compound requires a theme non-head as in (46) whereas the attributive compound in (47) does not.⁵

(46) Ieva yra mės-os valgy-toj-a. (47) ??Ieva yra valgytoja.
Ieva.NOM be.PRS.3 meat.GEN eat-AG-NOM.F.SG Ieva.NOM be.PRS.3 eat-AG-NOM.M.SG
'Ieva is a meat eater.' 'Ieva is an eater.'

(48) Ieva turi duon-maiš-į. (49) Ieva turi maiš-ą.
Ieva.NOM have-PRS.3 bread-bag.M-NOM.SG Ieva.NOM have-PRS.3 bag.M-NOM.SG
'Ieva has a bag for bread.' 'Ieva has a bag.'

3.5 Summary

- The first element in the compound is a non-head which semantically restricts the meaning of the head.
- The second element in the compound is a head which determines gender and number features of the compound.

³Most attributive compounds in Lithuanian are compositional/transparent. Nevertheless, there are a few compounds whose meaning is less transparent.

⁴The two elements can be in a symmetric relation e.g., *actor-director* (Ingason and Sigurðsson 2020). Some examples from Lithuanian are provided below:

- | | |
|--|---|
| (i) striuk-maršk-ini-ai
jacket-shirt-n-NOM.SG
'a jacket-shirt' | (ii) kviet-rug-iai
wheat-rye.M-NOM.PL
'wheat-rye' (mixed together) (Inčiuraitė-Noreikienė 2015:251) |
|--|---|

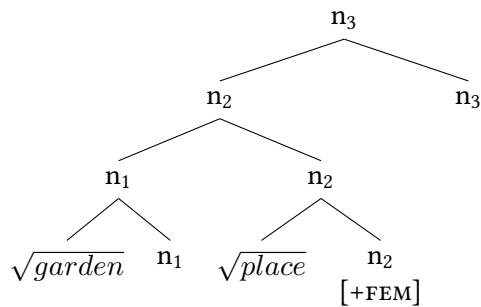
⁵Examples based on the data discussed in Ingason and Sigurðsson 2020.

- The class features of the head are not retained. The compound is assigned default either Class I.a or Class II.b, which are default.

4 The Analysis

- In DM, every root must combine with a category-defining morpheme (Embick and Marantz 2008). We show that Lithuanian attributive compounds follow this tradition.
- Lithuanian compounds have complex structure whereby both the non-head and the head can be categorized by n as opposed to root-root compounds (for discussion see Iordăchioaia et al. 2017; Steddy 2019; Ingason and Sigurðsson 2020).

(50) sod-viet-ė
 garden-place.F-NOM.SG
 ‘a place for a garden’ (Class II.b)



4.1 n2

- The second element of the compound can have an overt n . E.g., the suffix *-kl* is usually added to nouns which denote some type of tools.

(51) med-is
 tree.M-NOM.SG
 ‘a tree’ Class I.a

(52) pjū-kl-as
 cut-*n*-NOM.M.SG
 ‘a saw’ Class I.a

(53) med-pjū-kl-is
 tree-cut-*n*-NOM.M.SG
 ‘a saw for cutting trees/wood’ Class I.b

- If n_2 is merged with the root first, then we expect to see this word independently of the compound, which is true, as in (52)
- Another example comes from nouns with the suffixes like *-yn* or *-ykla*.

(54) sod-as
 garden.M-NOM.SG
 ‘a garden’
 Class I.a

(55) kaim-yn-as
 village-*n*-NOM.SG
 ‘neighbor’
 Class I.a.

(56) sod-kaim-yn-is
 garden-neighbor-*n*-NOM.M.SG
 ‘garden neighbor’
 Class I.b.

(57) duon-a
 bread.F-NOM.SG
 ‘bread’
 Class II.a

(58) kep-ykl-a
 bake-*n*-NOM.F.SG
 ‘a bakery’
 Class II.a

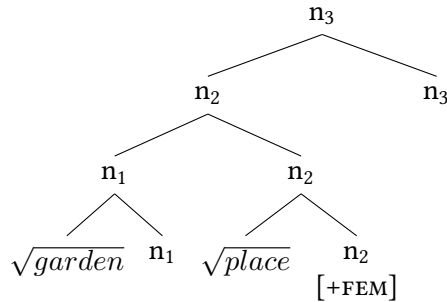
(59) duon-kep-ykl-ė
 bread-bake-*n*-NOM.SG
 ‘a bread bakery’
 Class II.b

- It has been proposed that *n* bears a gender feature in Lithuanian (Šereikaitė 2018; Adamson and Šereikaitė 2019, also see Armoskaite 2011, 2014 for a related approach). For example, an overt *n* determines the gender feature of the noun.

- (60) a. graž-us vakar-∅-as
 beautiful-NOM.M.SG evening-*n*-NOM.M.SG
 ‘beautiful evening’
- b. graž-i vakar-ien-ė
 beautiful-NOM.F.SG evening-*n*-NOM.F.SG
 ‘beautiful supper’

- The head of the compound determines the gender. In order for that to happen, *n* that bears gender features must be present.

- (61) sod-viet-ė
 garden-place.F-NOM.SG
 ‘a place for a garden’ (Class II.b)



- If attributive compounds were root-root compounds, we could expect to see an idiosyncratic meaning (Iordăchioaia et al. 2017).
 - Lithuanian attributive compounds look very compositional.

4.2 n1

- Examples with the first element bearing nominal morphology with the suffix *-on*.

- (62) dirv-**on**-as soil-*n*-NOM.M.SG ‘land with soil’
- (63) viet-a place.F-NOM.SG ‘a place’
- (64) dirv-**on**-viet-ė soil-*n*-place.F-NOM.SG ‘a place with soil’

- The suffix *-yb* is often used for places or abstract nouns as indicated below.

- (65) sod-**yb**-a garden-*n*-NOM.F.SG ‘a homestead’
- (66) viet-a place.F-NOM.SG ‘a place’
- (67) sod-**yb**-viet-ė garden-*n*-place.M-SG ‘a place for a homestead’

4.3 n1 and n2

- Lastly, it is possible to have compounds where both *n* heads are overtly expressed.

(68) šlamš-t-as
trash-*n*-NOM.M.SG
'trash' Class I.a

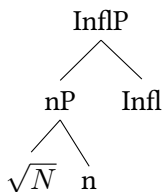
(69) mok-sl-as
teach-*n*-NOM.M.SG
'science' Class I.a

(70) šlamš-t-a-mok-sl-is
trash-*n*-L-teach-*n*-NOM.M.SG
'trash science' (Class I.b)

4.4 Above n_2 : projections and features

- The facts that the stem-final consonant is obligatorily palatalized in every Lithuanian compound, and that the inflectional class of the head of compound is lost, suggest to us that there is an element in the structure located between the n_2 -projection of the second element and Infl, with Infl being the node where inflectional formatives are realized:

(71) *The basic structure of an inflected noun:*

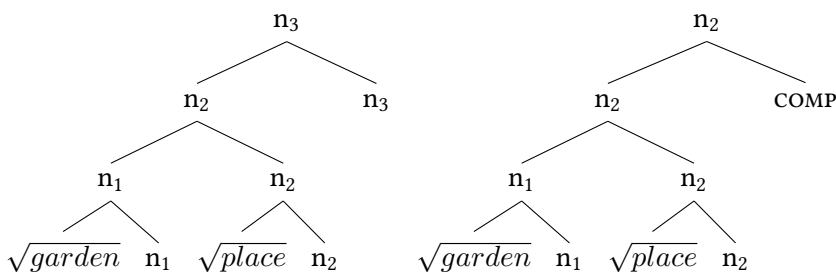


- This element serves the purpose of computing the resulting semantics of the entire compound.
- If there was no element between n_2 or if an existing element had a null surface realization (in which case it could be pruned, as in Embick 2010), the inflectional class of n_2 should be realized by Infl under linear adjacency.

(72) $[[[\sqrt{\text{root1}} n_1] [\sqrt{\text{root2}} n_2]] \text{Infl}] \rightarrow \sqrt{\text{root1}}_{n_1} \sqrt{\text{root2}}_{n_2[\text{Cl}]} \text{Infl}$

- Following Kramer (2015) and Gouskova and Bobaljik (to appear), it is conceivable that this element is either a functional head or an adjunct:

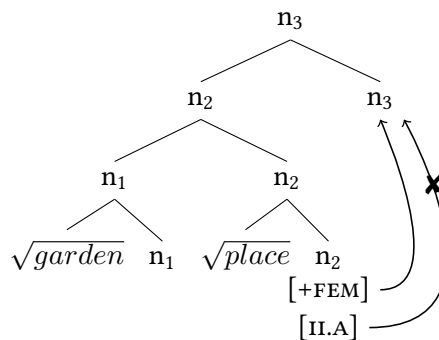
(73) *The possible structures immediately above n_2 :*



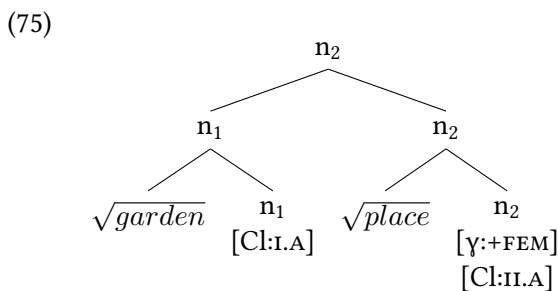
- In either case, the crucial property of this item is:
 - it is phonologically non-null (see below), thus making n_2 and any element higher in the structure no longer linearly adjacent, which will, in turn, prevent the entire nominal from inheriting n_2 's class features.
- We propose that attributive compounds have an n_3 head. This head serves the purpose of resolving the compound's semantics.

- Perhaps there are languages that realize n_3 overtly. We claim that Lithuanian does.
- This n_3 has no gender, thus it is a plain n . According to the cyclicity analysis (Kramer 2015) which assumes strict PIC, compounds in Lithuanian should bear the default gender, which is masculine.
 - **Highest Gender Wins:** “the gender of the highest n is the agreeing gender of the nominal.”
- To account for the fact that the compound inherits the gender of the n_2 -head, we assume a weaker version of PIC where the edge of the lower phase is accessible for subsequent syntactic operations.

(74) sod-viet-ė
 garden-place._F-NOM.SG
 ‘a place for a garden’ (Class II.b)



- The derivation is as follows. First off, the first root is combined with its categorizer, and the categorizer of the second root also puts n_1P in its specifier position:



- Next, the n_3 -head is added. The n_3 -head is consistently exponed (in all Lithuanian compounds across the board) via the floating palatalization feature:⁶

It is shown that some of the forms that consistently surface with a zero inflectional marker actually involve a phonologically non-empty exponent whose presence may be diagnosed indirectly.

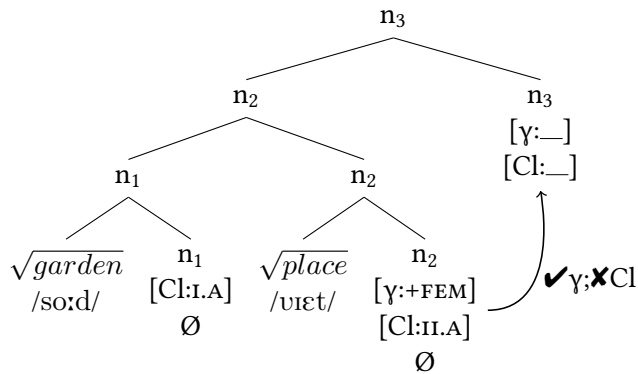
(76) a. $n_{\text{COMP}} \leftrightarrow [\text{DOR-bk +hi}]$
 b. /so:dviet-/ + [-bk +hi] \rightarrow so:dviet^j-

- Since this is a cyclic head, its complement undergoes Spell-Out. However, the edge of the phase, i.e. the head of the n_2P remains accessible for agreement operations:
 - The gender features of n_2 percolates up. The unvalued gender feature of n_3 receives gender from n_2

⁶Thus we assume that a head can have no overt exponent, but it can be manifested through “phonologically non-empty exponents” which can be identified through through different phonological processes on adjacent segments see Cavarani and Van Oostendorp 2019 for discussion.

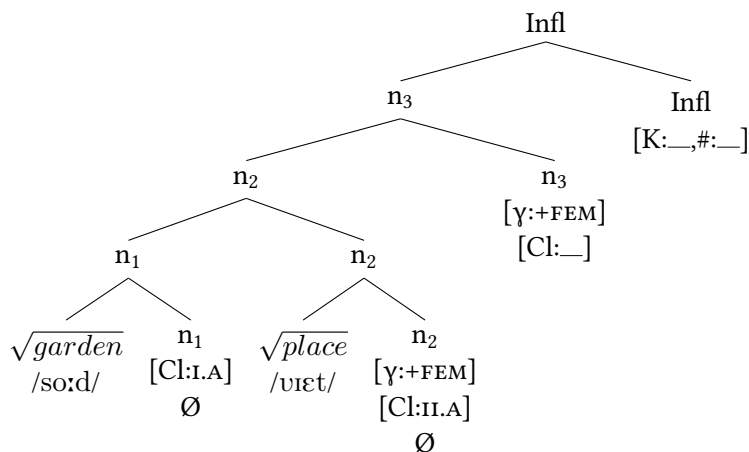
- Inflection Class feature does not percolate up and is inaccessible for n_3 .⁷
- Thus, we provide evidence for the observation in Gouskova and Bobaljik 2020 that declension class is subject to strict linear adjacency.

(77)



- The Infl head is added and the derivation continues (the rest of the DP is not shown here for economy purposes):

(78)

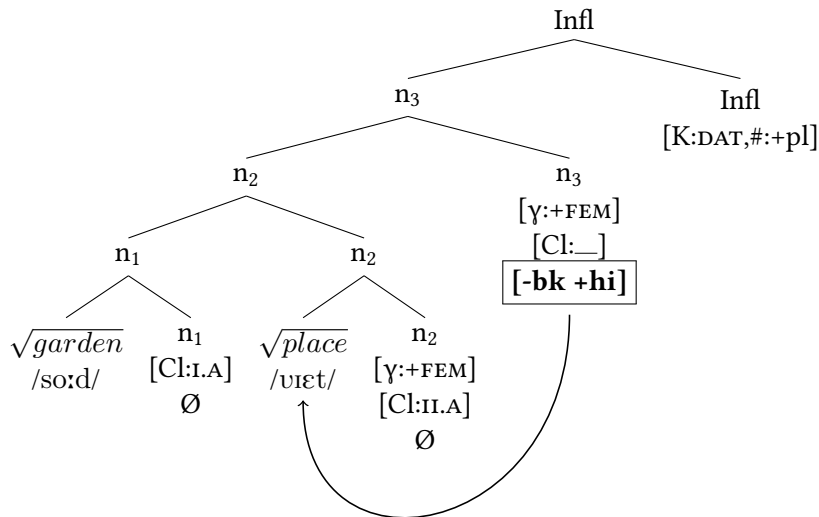


- At some point, when the edge of the cyclic domain is reached (for example, when D is added, D being a cyclic head), the rest of the structure will be spelled out. The exponent of n_3 is the floating palatalization feature mentioned above. The feature descends and docks onto the closest non-null element: the final segment of the root (\sqrt{place}).⁸

⁷Percolation precedes vocabulary insertion. Gouskova and Bobaljik to appear:17 argue that the reason why class features do not percolate is because they are features of vocabulary items or exponents, whose realization happens after percolation.

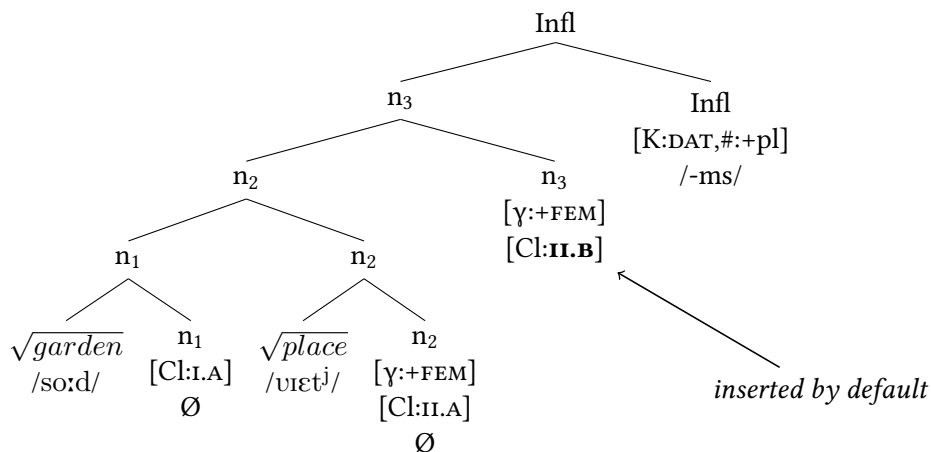
⁸Generally, the palatalization feature will descend to the least deeply embedded node, e.g. an adjoined diminutive head if there is one in the structure.

(79)



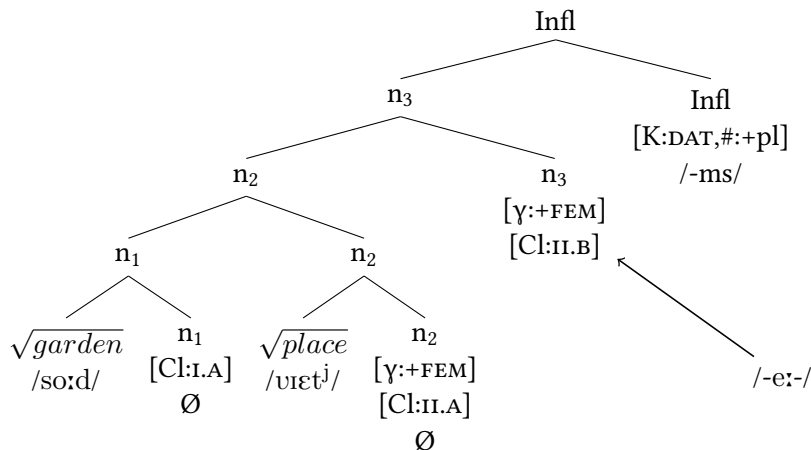
- In order to expone case and number on Infl, class feature are needed. Since n_3 lacks class features, class II.b is inserted by default based on the fact that the gender feature is [+fem] and the final segment of the already spelled-out complement of n_3 is palatalized:

(80)



- Following Embick (2010), the theme vowel is inserted last. It can only be inserted in the vicinity of n_3 because only this n-head is in the domain that is currently being spelled out:

(81)



5 Conclusions

- In this talk, we argued that Lithuanian attributive compounds have a complex structure where both roots are nominalized.
- We demonstrated that the head of the compound determines the number and gender features of the entire compound, but its class features are lost.
- This study suggests that gender features can percolate up whereas Class features are subject to strict locality.
- Lastly, we demonstrated that Kramer’s hypothesis that the highest gender wins cannot be supported under strict phase theory.

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