

A dual theory of roots: Evidence from gender-marking languages¹

Theoretical question:

- do roots have syntactic features?
- if they do
 - what kind of object are they, and
 - how do they interact with the rest of the syntactic structure?

Motivation for this research question: Inherent contradiction in the literature:

- DM literature on roots:
 - no syntactic features on roots (Marantz 2001, Arad 2003, a.o.)
 - vs. roots with syntactic features (i.e., taking syntactic complements, Harley 2014; but see Alexiadou 2014, Svenonius 2014, a.o., for counterarguments)
- theories of gender/number marking:
 - gender/number: a feature stored with the nominal representation in the lexicon (Steriopolo and Wiltschko 2008, Kramer 2009, a.o.)
 - vs. a feature on a higher functional head (Ritter 1993, 1995, Kramer 2015 a.o.)

Our take:

- the disagreement has an empirical underpinning

Our proposal in a nutshell:

- roots may have syntactic features \Rightarrow this structural property interacts with derivational timing:
 - root *without* syntactic features \Rightarrow LATE INSERTED
 - roots *with* syntactic features \Rightarrow EARLY INSERTED
- **the rationale:** features on roots must be available to syntactic computation; if there are no syntactic features, computational economy forces Late Insertion

Concretely, in the domain of gender:

- INDEXED ROOTS (\sqrt{i} ; Acquaviva 2008 a.o.):

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- Late Inserted
- default functional architecture
- idiosyncratic properties of the root irrelevant for the functional structure of the DP
- FEATURED ROOTS (\sqrt{F}):
 - Early Inserted
 - functional architecture dependent on the syntactic features of the root

1 The (ir)regular gender system of Polish

1.1 Types of nouns

- Polish common nouns: a three-way gender system (masculine, feminine, neuter)²
- exception: Polish Profession Attributive Nouns (PPANs) \Rightarrow a two-way system (masculine and feminine)

Three types of PPANs:

- Type I: \checkmark masculine, \checkmark feminine (-ka endings³)
 - (1) *kurier*+ \emptyset ‘courier.M’ vs *kurier+ka* ‘courier.F’ \checkmark M, \checkmark F
- Type II: \checkmark masculine, *feminine
 - (2) *premier* ‘PM.M’ vs **premier+ka* ‘PM.M’ \checkmark M, * F
- Type III: *masculine, \checkmark feminine (1c)
 - (3) **guwernant* ‘governess.M’ vs *guwernant+ka* ‘governess.F’ * M, \checkmark F

1.2 Agreement variation

Two agreement patterns in PPANs:

A. Homogeneous (Type I & III):

- the same gender throughout

²We ignore animacy. This might turn out to be a problem as we deal with a variation in the domain of animate nouns. The reason we think this is a fairly safe move is that in Polish animacy is grammatically encoded only in masculine nouns but the issue we investigate concerns both feminine and masculine nouns.

³To our knowledge, -ka is the only nominal feminine ending in Polish. Other feminine endings, such as -owa in *krawiec* – *krawc-owa* ‘tailor’, -ini in *maszalek* – *marzałk-ini* ‘marshal’, -ina in *wojewoda* – *wojewodz-ina* ‘duke’ and -na in *rad-ny* – *rad-na* ‘council member’, are morphologically adjectival.

- (4) a. Ten nasz kurier
that.M our.M courier.M
✓ M M M
- b. *Ta nasza kurier
that.F our.F courier.M
* F F M
- c. Ta nasza kurierka
that.F our.F female courier.F
✓ F F F
- d. *Ten nasz kurierka
that.M our.M female courier.F
* M M F
- (5) a. Ta nasza guwernantka
that.F our.F governess.F
✓ F F F
- b. *Ten nasz guwernantka
that.M our.M governess.F
* M M F
- c. *Ten nasz guwernant
that.M our.M male governess.M
* M M M

B. Mixed (Type II):

- male referent ⇒ masculine throughout
- female referent ⇒ noun masculine, agreeing elements may be feminine

- (6) a. Ten nasz Premier
that.M our.M PM.M
✓ M M M (male referent)
- b. Ta nasza Premier
that.F our.F PM.M
✓ F F M (female referent)

1.3 The proposal in a nutshell

The core argument:

- the restriction on nominal gender pairs and mixed agreement patterns attested in Polish is a direct consequence of the distinction between indexed vs featured-roots

Noun types based on indexed roots:

- common (non-PPAN) nouns (*kobieta* ‘woman.F.SG’, *mężczyzna* ‘man.M.SG’, *dziecko* ‘child.N.SG’; *książka* ‘book.F.SG’, *stół* ‘table.M.SG’, *krzesło* ‘chair.N.SG.’)
- Type I PPAN (*kurier* ‘male courier’, *kurierka* ‘female courier’)

The commonality:

- agreement features mediated by an index
- no syntactic agreement carried out by functional heads of the extended nominal domain⁴
- ⇒ Late Inserted

The difference:

- common (non-PPAN) nouns: index feature valued ⇒ overall gender fixed
- Type I PPAN: index gender value unspecified, determined by D instead ⇒ overall gender sensitive to the natural gender of the referent; hence possible gender variation

Noun types based on gender-featured roots:

- Type II PPAN (*premier* ‘PM’, **premierka* ‘female PM’)
- Type III PPAN (**gouvernant* ‘male governess’, *gouvernante* ‘governess’)

The commonality:

- a syntactic gender feature on the root
- enforces syntactic agreement on functional heads in the extended domain
- ⇒ Early Inserted

The difference:

- Type II PPAN: unmarked gender feature; subject to impoverishment; gender fixed in the lower spell-out domain, variable in the higher spell-out domain
- Type III PPAN: marked gender feature; gender fixed throughout

2 Indexed vs gender-featured roots

2.1 Derivational basics

First Merge as a derivational starter (de Belder & van Craenenbroeck 2015):

- the work space starts as the \emptyset set
- the motivation: Merge always binary
- \emptyset = placeholder for late-root insertion

Minimally needed projections:

⁴Note that by syntactic agreement we mean Agree under c-command.

- n, Num and D (Ritter 1995, Borer 2003)

Merge as Agree:

- Agree as c-selection (Adger 2003)
- relevant for labeling of the Merge set - effectively all features of the merged set becomes the label

Work space:

- the minimal extended projection that includes all defining features of the category associated with the root inserted or to be inserted (in our case, includes number and gender but excludes Person and D)

Spell-Out domain:

- the smallest work space where all features have been checked (but not necessarily valued)
- only terminated workspace can be spelled-out

Subset principle:

- lexical insertion of the inflected noun subsumes the adjacent functional heads (n & Num)
- possible only if the features of functional heads are a subset of the inserted lexical items
- otherwise features must be realized as a separate morpheme

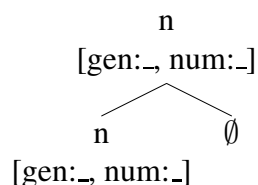
2.2 How it works

2.2.1 Case (I): common (non-PPAN) nouns (masculine/feminine/neuter; standard case)

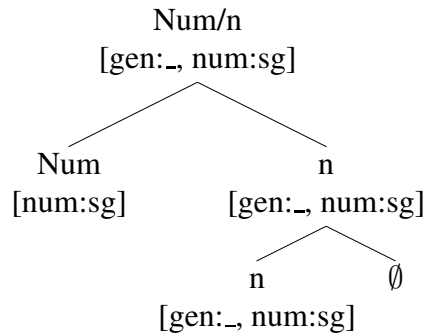
- index gender feature: valued
- most Polish nouns, which have fixed gender values

(7) Simplified derivation of *kobieta*.F ‘woman’

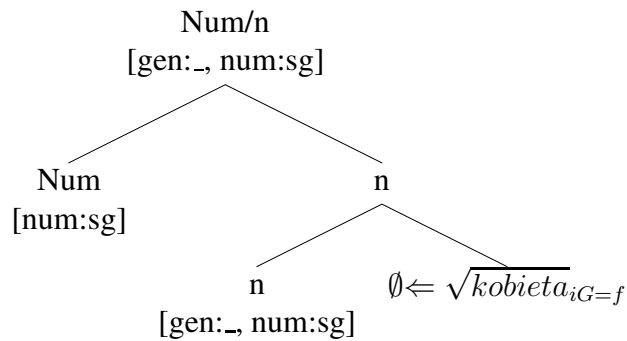
a. no root; functional head (*n*) merged directly with work space (\emptyset); *n* projects:



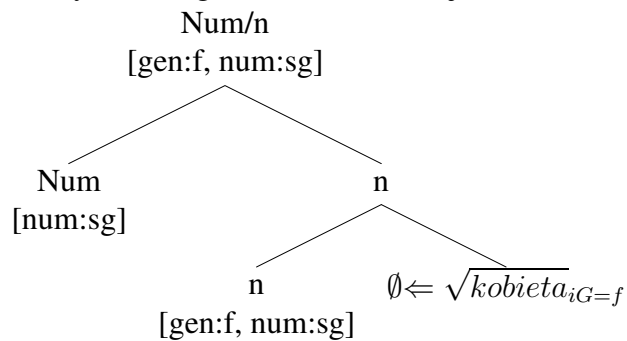
- b. Num merged with n; valued num feature on Num; valuation of num by Merge as Agree:



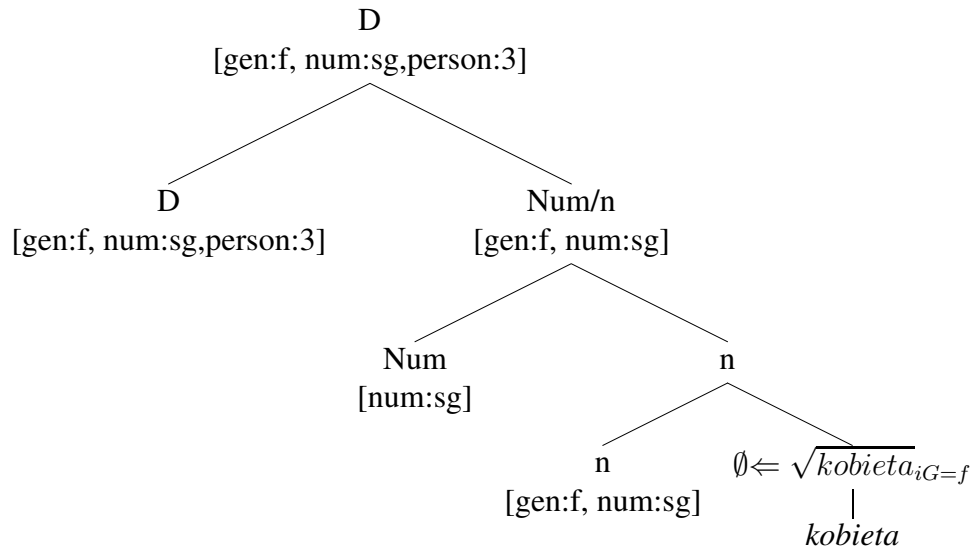
- c. Work space terminates, root insertion takes place:



- d. Post-syntactic agreement/feature adjustment:



- e. D merged (\sim a bundle of unvalued ϕ -features + valued person): Merge as Agree (for gender & number) & Spell-out of the complement of D:

**Consequences:**

- \Rightarrow everything in the D domain and above shares the features of the adjusted label of Num/nP
- unvalued gender feature can copy any gender value from the indexed root (recall: agree = matching + valuation)
- no Agree as a goal-seeking relation in the DP domain; all feature sharing done by Merge as Agree

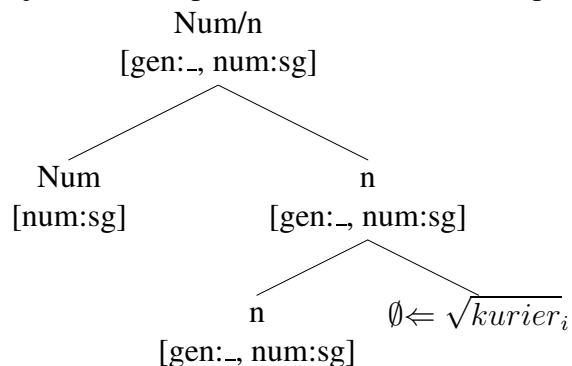
2.2.2 Case II: Type I PPAN roots (\checkmark masculine, \checkmark feminine)

- index gender feature: none
- a valued gender feature: introduced by a functional head (D); reflects the contextual value of the referent (Kramer 2009, 2015, Steriopoło and Wiltschko 2009, Kučerová 2017 a.o.)

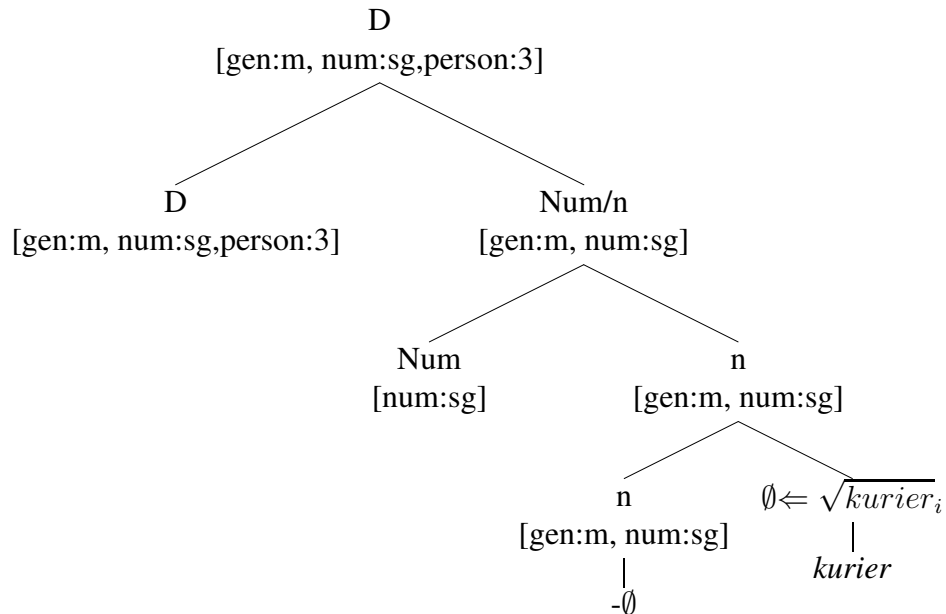
(8) Simplified derivation of *kurier.M* ‘male courier’

a.–b . as above

- c. Work space terminates, root insertion takes place; Post-syntactic agreement/feature adjustment not possible (index without a specific gender feature):



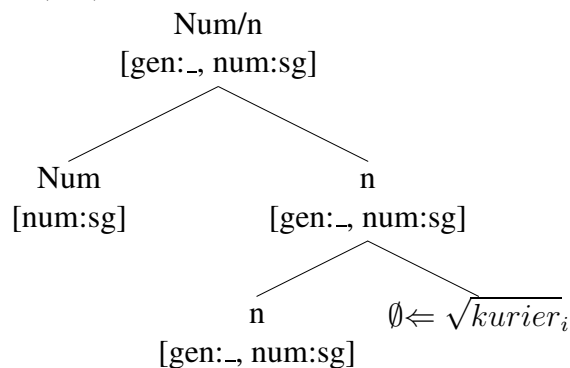
- d. D merged (\sim valued person & gender but not number): Agree by Merge (after valuation within the Agree chain; Agree-copy in the sense of Arregi & Nevins) & Spell-out of the complement of D:



- unvalued index + masculine feature by D \Rightarrow no overt gender affix⁵
- unvalued index + feminine feature by D \Rightarrow morphology realizes the feminine gender on *n* by a feminine-specific *-ka* (no feminine gender on the root \Rightarrow the subset principle does not apply)

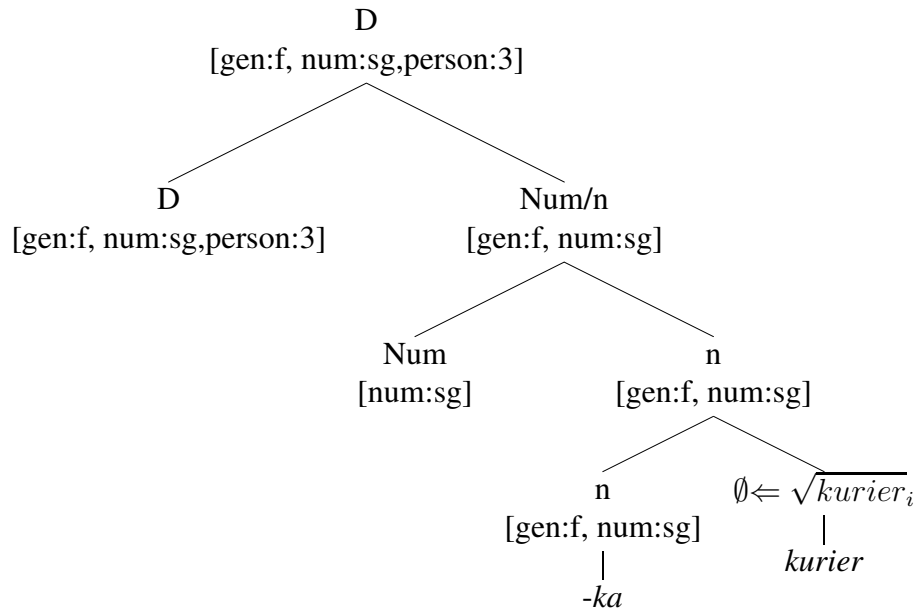
(9) Simplified derivation of *kurierka.F* ‘female courier’

- a. As (a–c) above:



- b. D merged (\sim valued person & gender but not number): Agree by Merge & Spell-out of the complement of D:

⁵The prediction is that the feminine forms of such nouns must be DPs. We are not convinced that this prediction is (always) correct (putting aside the non-trivial question of how we determine what constitutes the NP/DP distinction in a language like Polish). That the valued gender feature is introduced by D is not crucial for us. Any higher functional head would do. For instance, a head like Pesetsky (2013)’s *zh* would work well for this type of nouns.



2.3 Gender Featured Root

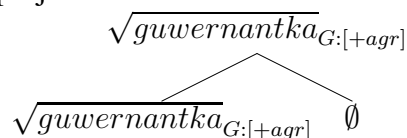
- roots with a syntactic feature, here gender (\sqrt{G})
- \sqrt{G} : \pm AGR feature [\sim marked/unmarked value; not m/f/n as such]
- $G[\pm$ AGR]: projects a functional structure
- \sqrt{G} has to be Early Inserted

2.3.1 Case III: Type III PPANs (* masculine, \checkmark feminine)

- gender feature on roots marked: +AGR
- +AGR feature projects a functional head \Rightarrow gender on functional head marked
- (impoverishment cannot take place)
- morphology associates roots with the feminine affix *-ka* (feminine \sim the marked gender in Polish) \Rightarrow no separate morphological realization of the n head

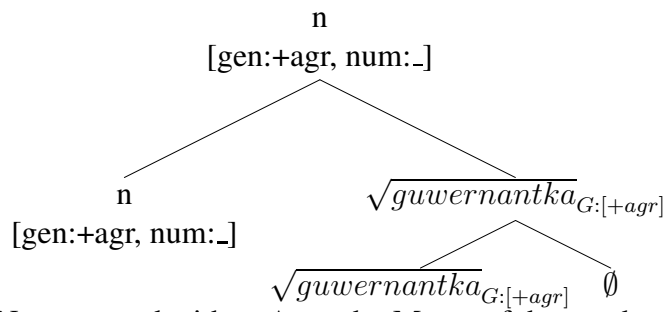
(10) Simplified derivation of *guwernantka*.F ‘governess’

- a. root with a gender feature (+AGR) merged directly with work space (\emptyset); the root projects:⁶

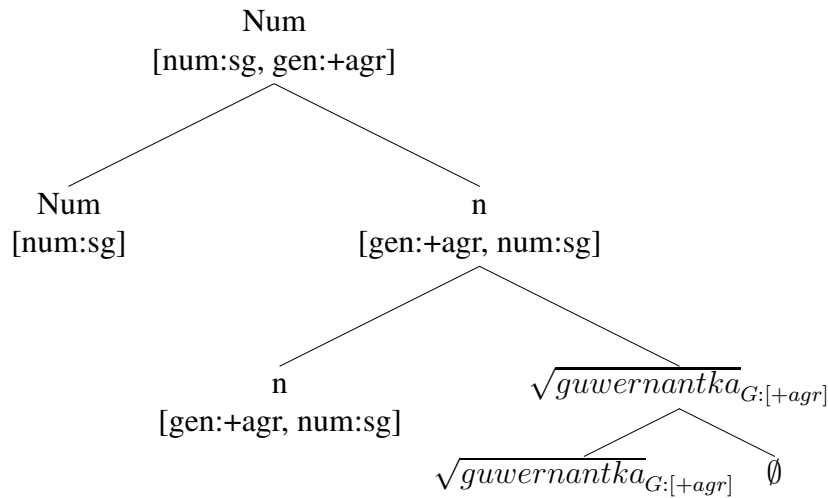


⁶Dan Milke raised the question of why the \emptyset cannot be used to insert another root. Note that if such an additional root was early inserted, it wouldn't be able to project and in turn it would fail to check its syntactic features. If such a root was late inserted it would be inserted in a structurally infelicitous context.

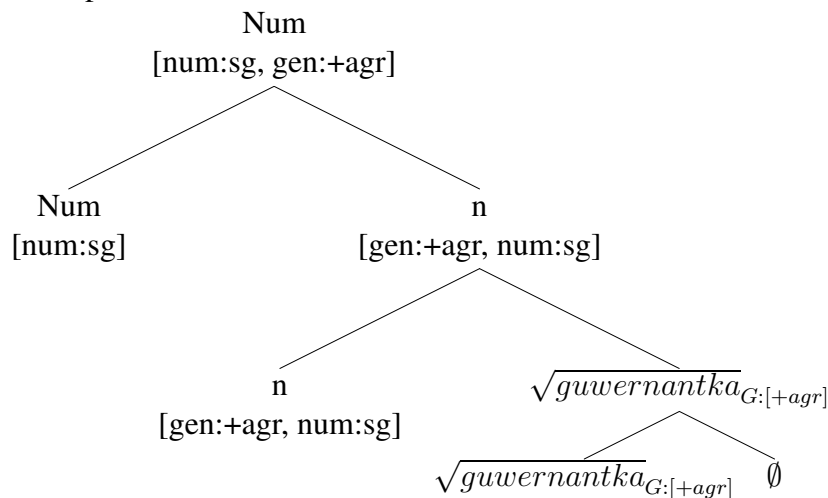
- b. n merges with the root; gender feature on n valued by the root (by Merge as Agree):



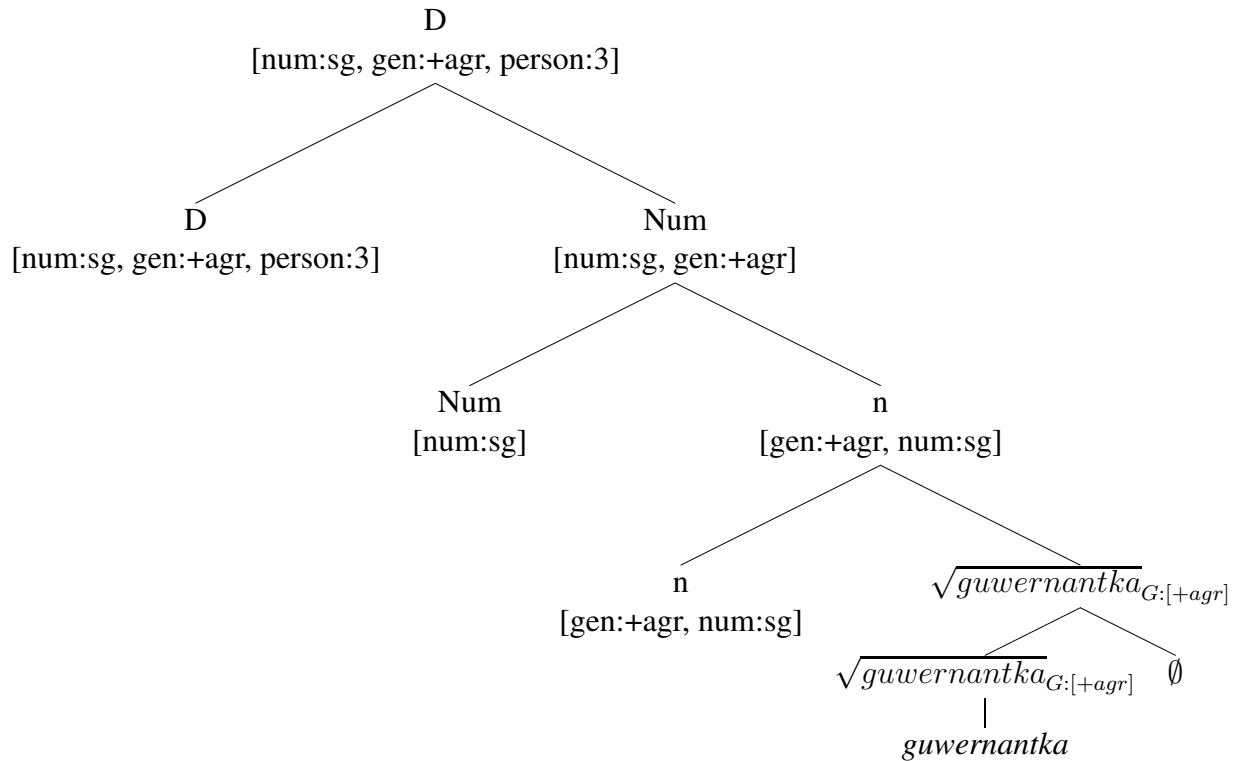
- c. Num merged with n ; Agree by Merge of the number feature:



- d. Work space terminates:



- e. D merged; num and gen shared by Merge as Agree & Spell-out of the complement of D:



Consequences:

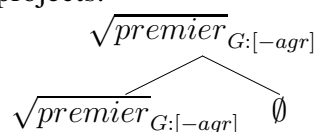
- no masculine forms of the noun as the *-ka* is not an overt realization of the n head with fem feature but it is included in the stored root entry
- no masculine agreement in the D domain either, as the gender feature value is fixed by the +AGR

2.3.2 Case IV: Type II PPANs (√ masculine, * feminine; mixed agreement in DP)

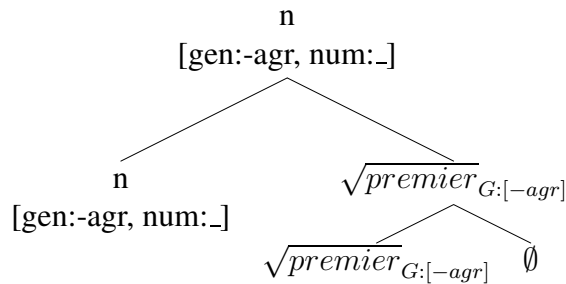
- gender feature on roots unmarked: –AGR
- –AGR feature projects a functional head ⇒ gender on functional head unmarked
- ⇒ subject to impoverishment (Noyer 2000; Bonet 1991)
- morphologically affix-less roots

(11) Simplified derivation of *premier.M* ‘prime minister’

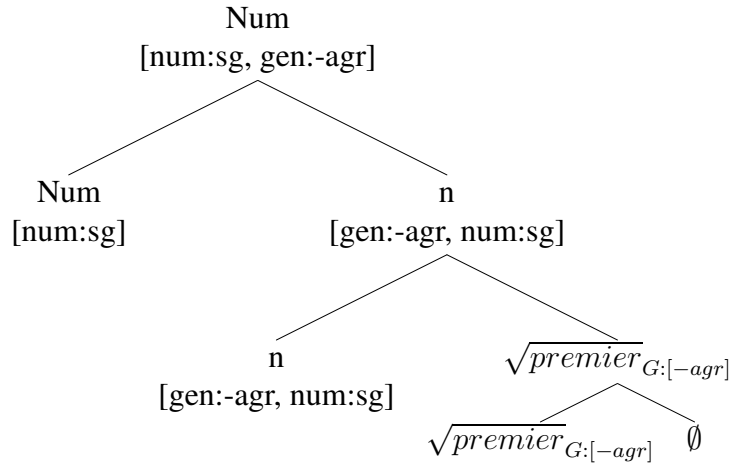
- a. root with a gender feature (-AGR) merged directly with work space (\emptyset); the root projects:



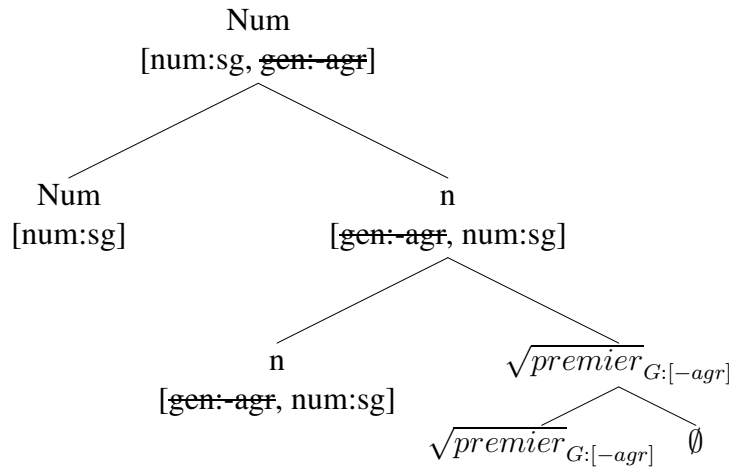
- b. *n* merges with the root; gender feature on *n* valued by the root (by Merge as Agree):



- c. Num merged with *n*; Agree of the number feature:

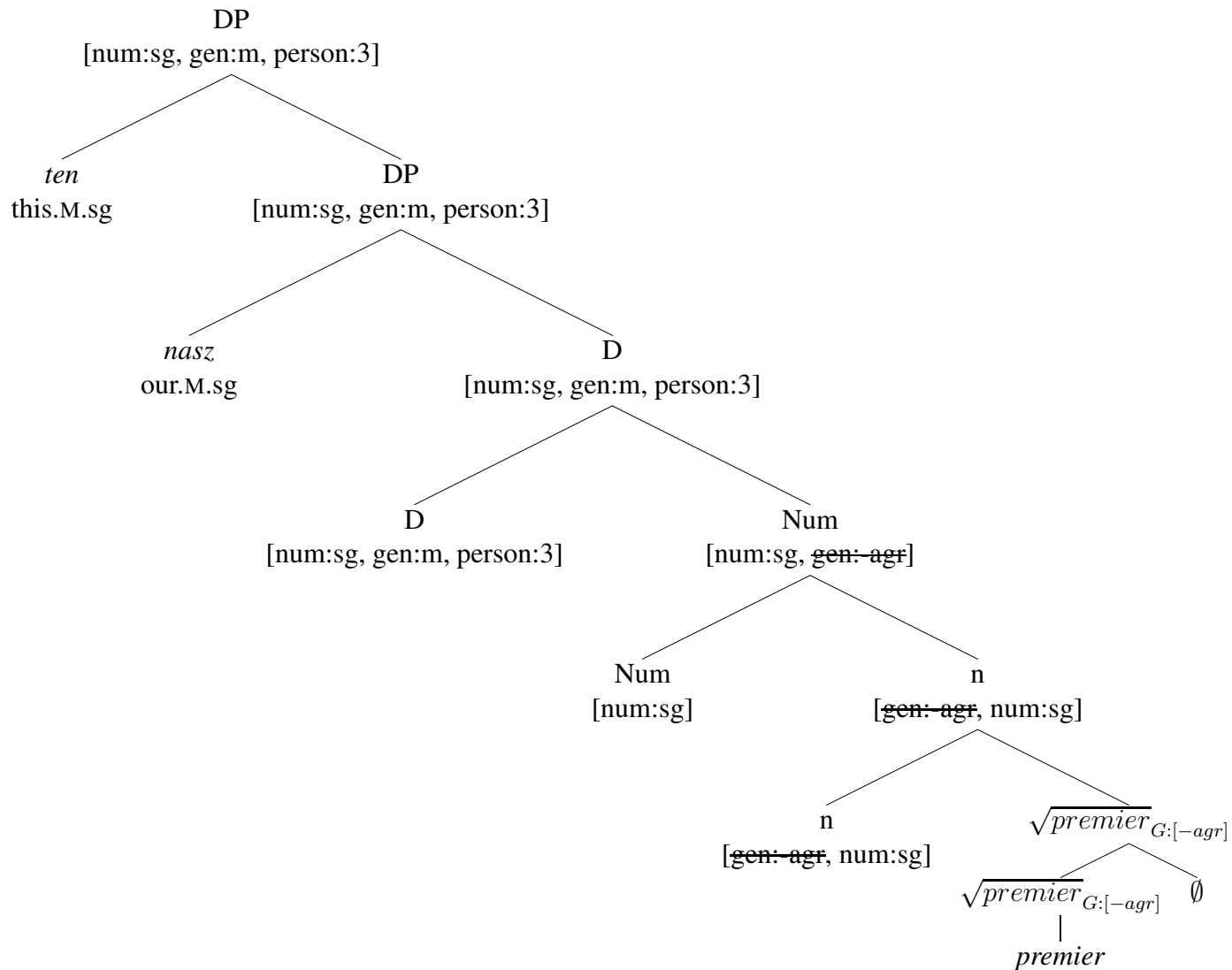


- d. Work space terminates, impoverishment takes place:⁷



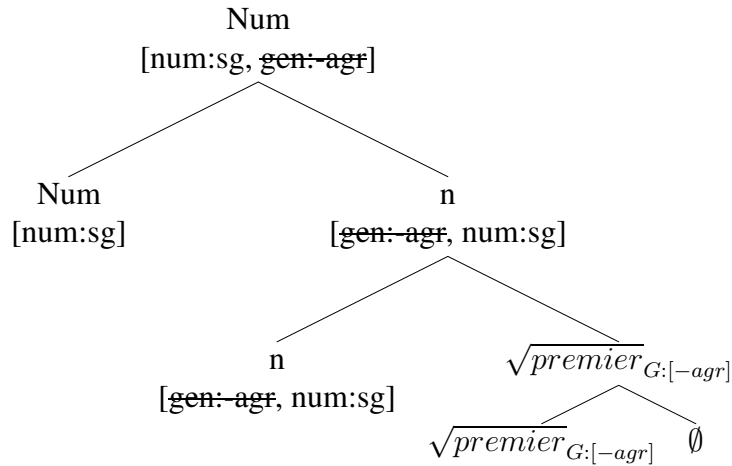
⁷This is the tricky step in the derivation: impoverishment should take place only at spell-out but we'd first need to merge the D head to be able to spell-out the complement.

- e. D merged; D with valued gender (m) and person (3); num shared by Merge as Agree & Spell-out of the complement of D:

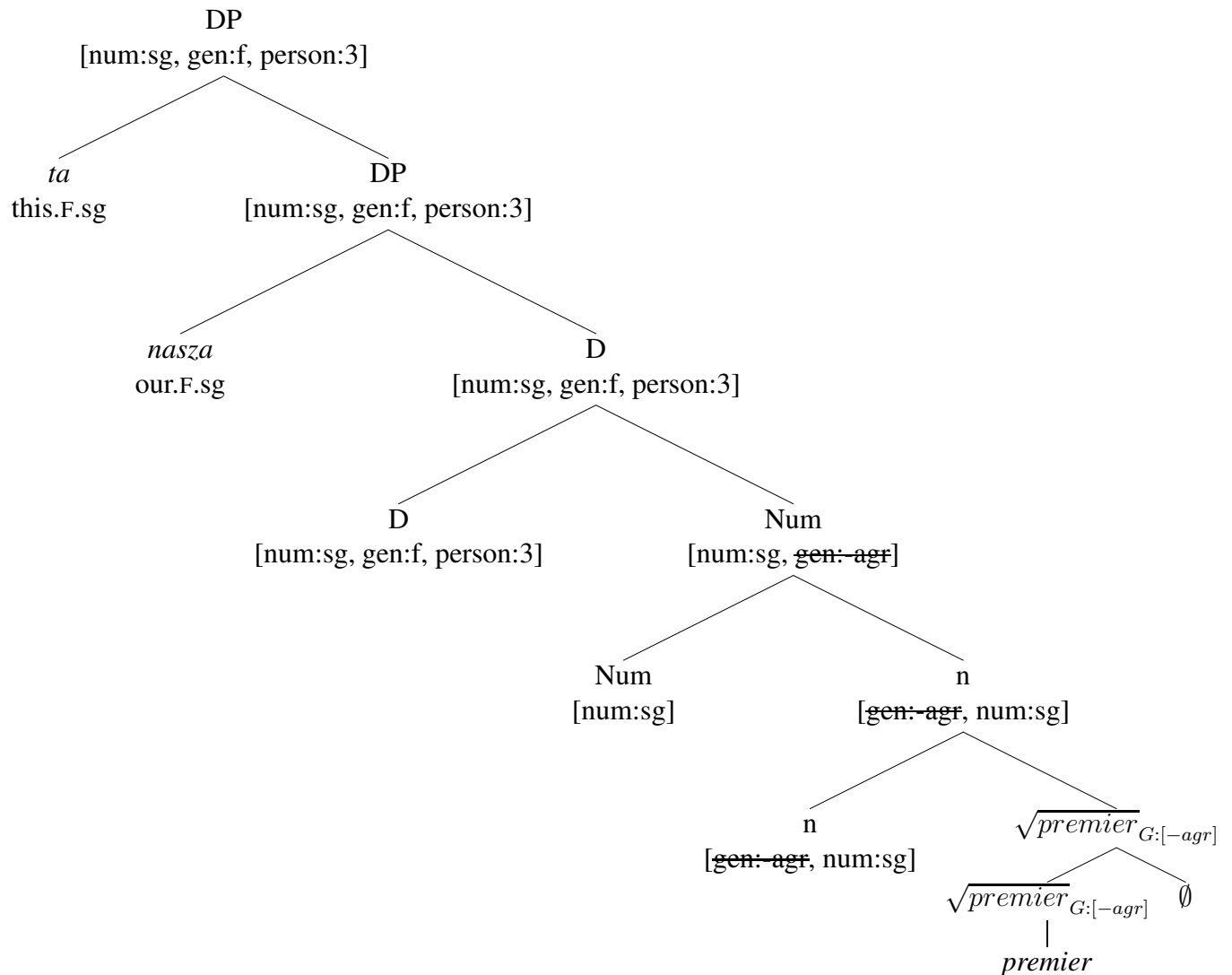


(12) Simplified derivation of *premier.F* ‘female prime minister’

a. As (a)–(c) above; Work space terminates, impoverishment:



b. D merged; D with valued gender (f) and person (3); num shared by Merge as Agree; Spell-out of the complement:



Consequences:

- mixed agreement
- male referent \Rightarrow agreeing elements masculine
- female referent \Rightarrow agreeing elements may be feminine, the noun itself appears masculine (affixless)

3 Conclusions

- roots are not homogeneous when it gets to their syntactic features
- while some roots don't have any syntactic feature from the lexicon, other roots do
- consequences for derivational timing and properties of the extended functional domain
- consequences for our typology of features

Feature geometry

- syntactic features on functional heads:
 - familiar well-behaved features
 - valued/unvalued; subject to matching and valuation in Agree
- features of indexed roots:
 - non-binary values possible (noun classes, 3-way gender systems etc.)
 - may be post-syntactically copied on unvalued features⁸
- features of featured roots:
 - strictly binary
 - always valued
 - project through the structure by Merge as Agree (Adger 2003, Béjar et al. 2015)
 - relation to the distinction between Concord and Agree

⁸The basic idea is reminiscent of Arregi and Nevins's work on Basque and their distinction between Agree-value and Agree-copy. The difference is that in our proposal the application of Agree-copy is more restricted.