Malagasy N-bonding: A licensing approach

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1 Overview

1.1 N-bonding puzzles

- N-bonding refers to a morphological process in Malagasy (Western Austronesian) wherein nominals are morphologically bound to certain heads (Keenan & Razafimamonjy 1996, Keenan 2000).

- Usually, a segment *n* is used as a bonding element, as in (1)-(2).[1]

  (1) NON-ACTIVE VERB + AGENT

  voavoha-**n**'-ilay   vavy
  VOA.open-N-DEM   girl

  'opened by that girl'

  (2) POSSESSEE + POSSESSOR

  trano-**n**'-ny   olona
  house-N-DET   person

  'the person's house'

- The sentences below also include a non-active verb and an adjacent agent (3) or a possessee followed by a possessor (4), both constructions in which N-bonding is expected.

- However, no additional *n* segment is observed:

  (3) NON-ACTIVE VERB + AGENT

  tapak-**y**   ny   olona
  PV.cut-N   DET   person

  'cut by the person.'

  (4) POSSESSEE + POSSESSOR

  tongotr-**y**   ny   zaza
  foot-N   DET   child

  'the child's feet'

- Instead, in (3) and (4) the word-final /a/ raises to /i/, represented with an orthographic *y* in word-final position (*tapak**a** –> tapak**y***; *tongotr**a** –> tongotr**y***).

- Following descriptions by Paul (1996) and Pearson (2005), I assume that the word-final *y* surfaces instead of *n* due to surrounding phonological context.

- I propose that *y* and *n* are two different surface realizations of one underlying N-bonding element.

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[1]Glosses follow Leipzig conventions with the following additions: AV – agent voice; PV – patient voice; CV – circumstantial voice; PFX – verbal prefix; N – N-bonding element; APPL – applicative.

Main Questions:

- What is the role of the N-bonding element?

- How is it derived?

- How can its variation be explained?

> **Proposal:**
>
> - N-bonding reflects a head-head adjunction configuration.
>
> - More specifically, the presence of N-bonding signals that a nominal cannot be licensed via the structural mechanisms available in the language.
>
> - The N-bonding element is a set of features {COR, NAS} which surfaces as a subset of these features depending on surrounding phonological context.

1.2   Roadmap:

- Malagasy basics: word order, triggers, voice

- Structure and Licensing in Malagasy

- Local Dislocation as an alternative licensing strategy

- Feature Sprouting and variation

2   Malagasy Background

- Malagasy: Austronesian language of Madagascar.[2]

- Basic word order is predicate-initial, as shown in (5).

- Clauses contain a referentially and/or structurally prominent constituent called the Trigger (Schachter 1987, Pearson 2005), underlined in (5), which appears in clause-final position.

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[2]Unless otherwise cited, the data presented here comes from elicitation with two speakers of the Merina dialect. Data from other sources were also checked through elicitation.

(5)   BASIC PREDICATE-INITIAL WORD ORDER

    a. M-i-hinana ny   akondro R̲a̲b̲e̲.
        AV-PFX-eat   DET banana   Rabe

        'R̲a̲b̲e̲ is eating the banana.'   Verbal predicate

    b. Dokotera i̲   B̲a̲k̲o̲l̲y̲.
        doctor   DET Bakoly

        'B̲a̲k̲o̲l̲y̲ is a doctor.'   Nominal predicate

- Like many other Western Austronesian languages, Malagasy exhibits a rich voice system where voice morphology appears on the verb reflecting the thematic role of the trigger.

- Three voices: Agent Voice (AV), Patient Voice (PV), and Circumstantial Voice (CV):

(6)   a. **Agent Voice**

        M-an-didy trondro amin'ny   antsy n̲y̲   v̲a̲v̲y̲.
        AV-PFX-cut fish   with'DET knife DET girl

        'The g̲i̲r̲l̲ cuts the fish with the knife.'

    b. **Patient Voice**[3]

        Didi-**a(n)**-n'-ny vavy amin'ny   antsy n̲y̲   t̲r̲o̲n̲d̲r̲o̲.
        cut-PV-N-DET   girl   with'DET knife DET fish

        'The girl cuts t̲h̲e̲ ̲f̲i̲s̲h̲ with the knife.'

    c. **Circumstantial Voice**

        An-didi-**a(n)**-n'-ny vavy ny   trondro n̲y̲   a̲n̲t̲s̲y̲.
        PFX-cut-CV-N-DET   girl   DET fish   DET knife

        'The girl cuts the fish with t̲h̲e̲ ̲k̲n̲i̲f̲e̲.'

- Note that N-bonding occurs in PV and CV, but not in AV

- **Proposal:** N-bonding occurs between the non-active verb and following agent in PV and CV because of licensing constraints; the agent must be bound in order to be licensed.

3   Structure and Licensing in Malagasy

- Assumptions:

    – All nominals must receive Case

    – In Malagasy, there are only two structural licensors:

        * **CT**^{0}: responsible for assigning Nominative Case and licensing the trigger

        * **v/Voice**^{0}: responsible for assigning Accusative Case and licensing the theme

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[3]Note that the PV suffix is -*Vn* where the vowel is lexically determined. For example, for the verb *voha* 'to open', the PV form is *voha-**in***.

3.1 CT^0

- joint CT^0, following Martinović (2017) and Erlewine (2018).

- contains:

    - $[u\text{D}]$ which probes for the closest DP in its c-command domain and assigns it nominative case

    - $[\bullet\text{D}\bullet]$ raises the DP to its specifier position.

- the target nominal for CT^0 will be determined by the features on v/Voice^0.

(7)

```
                    CTP
              ╱            ╲
      DP_Trigger           CT'
                      ╱          ╲
                   CT              ...
                  [uD]          ╱      ╲
                  [•D•]      ...         v/VoiceP
                                      ╱        ╲
                          nom.      t           v/Voice'
                                            ╱        ╲
                                      v/Voice          ...
```
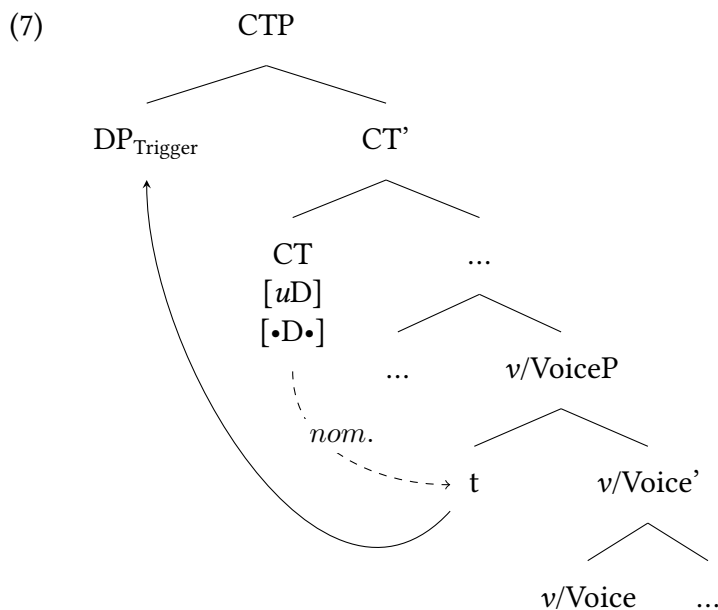
3.2 v/Voice^0

- I assume Malagasy exhibits different flavours of a bundled v/Voice^0, following proposals by Pylkkanën (2008) and Harley (2017).

- Depending on the voice, v/Voice^0 will contain a combination of the following features:

    - $[\bullet\text{D}\bullet]$: merge DP

    - $[u\text{D}]$: assign *acc.* to the closest DP argument in its c-command domain

- The different combinations of these features derive the correct patterns of trigger assignment and show the relevant patterns of nominal licensing in Malagasy.
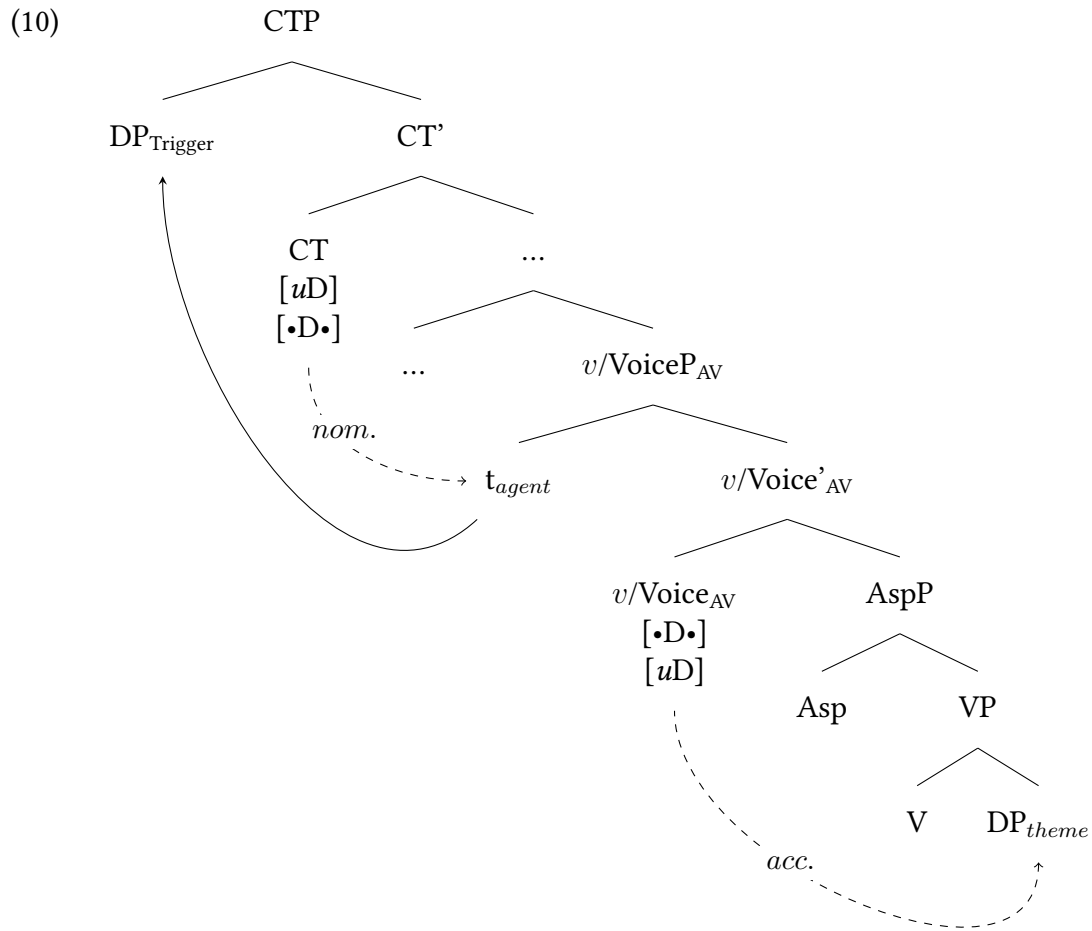
Agent Voice (v/Voice$^0_{AV}$):

1. [•D•]: merge the external argument

2. [uD]: assign *acc.* to the internal argument

(8) v/Voice$_{AV}$ assigns accusative case to the internal argument
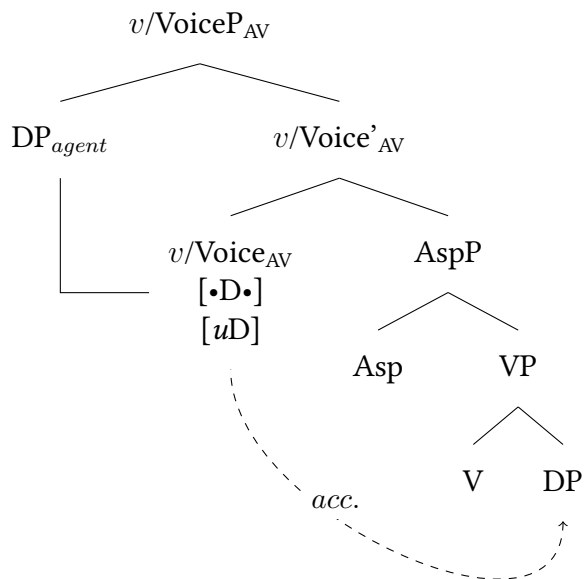
- Taking the structures in (7) and (8) together, an AV sentence like in (9) would have the structure in (10).

(9) M-an-didy   ny   trondro ny   vavy.
     AV-PFX-cut   DET   fish   DET   girl
     'The girl cuts the fish.'

(10)

                            CTP
                ┌────────────┴────────────┐
          DP_Trigger   CT'
                              ┌────────────┴────────────┐
                             CT   ...
                            [uD]   ┌──────────┴──────────┐
                            [•D•]   ...   v/VoiceP_AV
                              ╎   ┌──────────┴──────────┐
                           nom.   t_agent   v/Voice'_AV
                                                              ┌──────────┴──────────┐
                                                        v/Voice_AV   AspP
                                                          [•D•]   ┌────────┴────────┐
                                                          [uD]   Asp   VP
                                                                                   ┌──────┴──────┐
                                                                                   V   DP_theme
                                                                      acc.

Patient Voice v/Voice$_{PV}$:

1. [•D•]: merge the external argument

2. [•D•]^{EPP}: raise the internal argument to outer Spec, v/VoiceP

(11) v/Voice$_{PV}$ raises internal argument to outer specifier position
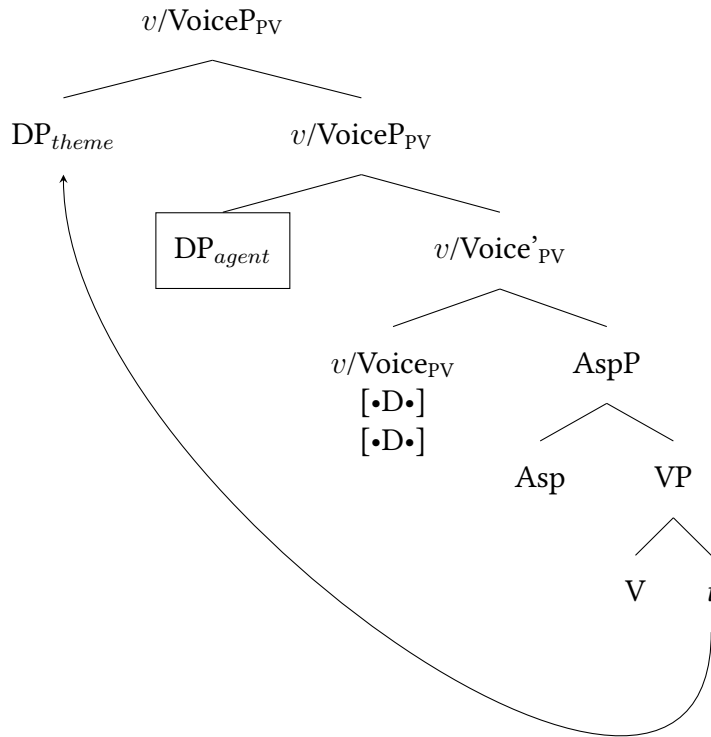
- Once CT^0 merges, the theme will be the highest DP in its c-command domain.

- CT^0 will assign nominative case to the theme and raise it to Spec, CTP as the trigger.

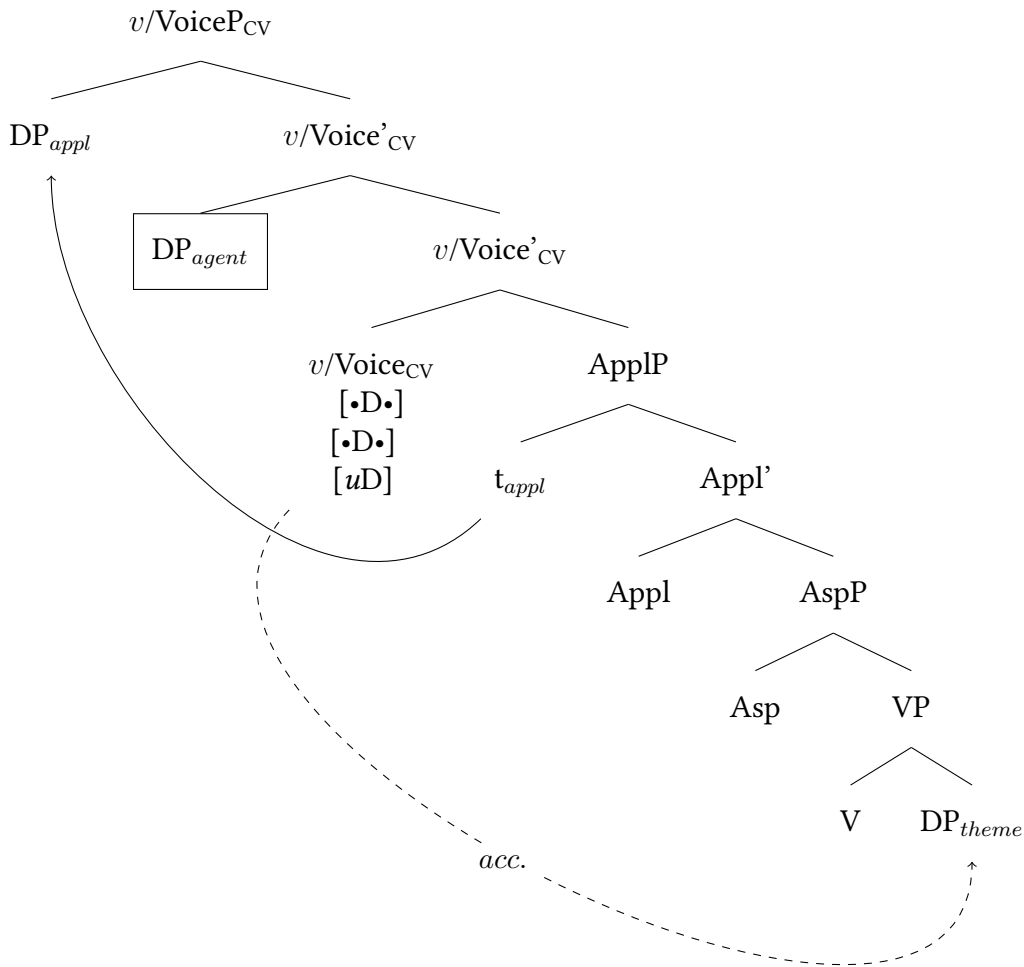- **Key Issue:** The agent cannot be licensed.

Circumstantial Voice v/Voice$_{CV}$:

- In CV, a nominal other than the agent or theme becomes the trigger.

- I assume the nominal is in the specifier position of an Applicative Phrase (following Pearson 2005) which is merged directly below v/VoiceP.

- In order for the applied argument to raise to trigger position, v/Voice^0 must have the following features:

1. [•D•]: merge the external argument

2. [•D•]^{EPP}: raise the applied argument to outer Spec, v/VoiceP

3. [uD]: assign *acc.* to the internal argument

Voice	[•D•]^{EPP}	[uD]
v/Voice$_{AV}$	✗	✓
v/Voice$_{PV}$	✓	✗
v/Voice$_{CV}$	✓	✓

(12) v/Voice$_{CV}$ raises applied argument *then* assigns accusative case to the internal argument

- Once CT^0 merges, the applied argument will be the highest DP in its c-command domain.

- CT^0 assigns nominative case to applied argument and raises it to Spec, CTP as the trigger.

- **Same Issue:** The agent cannot be licensed.

Main Pattern:

- Nominative case is available only to the Trigger.

- Accusative case is available only to the internal argument.

- Thus, any argument that is not in one of those two positions is left unlicensed.

- This will always be the case for agents in PV and CV (i.e. where N-bonding occurs).

4   Extending the analysis to the Nominal Domain

- Under the current analysis, only nominative and accusative case are available in Malagasy.

- N-bonding occurs when a nominal cannot receive either one.

- We saw above that N-bonding occurs in possessive constructions, in which the possessor is typically described as appearing in the genitive, an example is repeated in (13):

(13)   Possessee + Possessor

   trano-**n**'-ny   olona
   house-N-DET   person

   'the person's house'

- If we extend the analysis to the nominal domain, the presence of N-bonding in (13) signals the inability for the nominal to be licensed (i.e. the absence of abstract genitive case).

- Additional support for this licensing account of N-bonding comes from the distribution of noun complements to adjectives.

- Noun complements to adjectives in Malagasy occur in one of three different forms (see Ralalaoherivony 1995 and Paul 1996), shown in (14):

   a. Noun appears in the accusative case.

   b. Preposition appears between the adjective and noun, where the noun is appears in the accusative case.

   c. Noun appears in the genitive case.

- Crucially, N-bonding occurs only when the complement appears in the genitive case (14c)

- If there is no abstract genitive case available, then the pattern of N-bonding is consistent.

(14)   a. antra   olona
         compassionate   person.ACC
         'compassionate to people'

b. tsara ho   azy
good PREP 3SG.ACC

'good for him'

c. mainti-**n**'-ny molaly
black-N-DET   soot.GEN

'blackened by soot'   (Paul 1996)

Interim Summary:

- There are two structural licensors in Malagasy: CT^0 and $v/Voice^0$.

- N-bonding occurs when a nominal cannot be structurally licensed.

- This occurs for the agent in PV and CV since the agent does not become the trigger.

- The same patterns are found in the nominal domain when a nominal complement cannot be licensed by its respective head.

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5 Local Dislocation feeds N-bonding

- When a nominal cannot be structurally licensed, it must find an alternative strategy.

- I assume that Malagasy uses a licensing strategy called *Local Dislocation* (following Embick & Noyer 2001, Levin 2015, Erlewine 2016), a post-syntactic operation that yields a complex head.

- Local Dislocation is schematized in (15), where X•Y denotes a requirement that X must linearly precede and be adjacent to Y.

(15) ***Local Dislocation schema***
X • Y –> X+Y

(16) ***Local Dislocation in the verbal domain***
a. $[_T V^0]$ •$[_{DP} D^0 \dots]$ →$[_T V^0 + D^0]$ $[_{DP} \dots]$
b. $[_T$ Voavoha$]$ •$[_{DP}$ ny vavy $\dots]$ →$[_T$ Voavoha + ny$]$ $[_{DP}$ vavy$\dots]$

- Local Dislocation allows the nominal to count as part of the verbal extended projection, which obviates the need for the nominal to be Case-licensed (see Levin 2015).

- For the present purposes, Local Dislocation can be thought of as a last-resort licensing mechanism (following Erlewine 2018 for Toba Batak).

- The complex head feeds a language-specific *sprouting* operation which inserts features (Embick & Noyer 2007, Choi & Harley 2019).

- The final product of these operations is the realization of the N-bonding element.

(17) a. Unlicensed nominal   [verb] [DP] ☹

      b. Local Dislocation   [verb + D] [..NP] ☺

      c. Sprouting   [verb + **N** + D] [..NP]

6 Phonological Variation

- Recall the data from (1)-(4), repeated in (18)-(21) below

- How do we explain why N-bonding surfaces as *n* in (18) and (19) and as *y* in (20) and(21)?

(18) NON-ACTIVE VERB + AGENT   (19) POSSESSEE + POSSESSOR

      voavoha-**n**'-ilay   vavy   trano-**n**'-ny   olona
      VOA.open-N-DEM girl   house-N-DET person

      'opened by that girl'   'the person's house'

(20) NON-ACTIVE VERB + AGENT   (21) POSSESSEE + POSSESSOR

      tapak-**y** ny   olona   tongotr-**y** ny   zaza
      PV.cut-N DET person   foot-N   DET child

      'cut by the person.'   'the child's feet'

Proposal:

- When feature sprouting occurs, what is being inserted is really a bundle of features: CORO-NAL and NASAL.

- But, the surface realization must conform to Malagasy CV syllable structure

- These features surface as *n* when the preceding segment is a vowel, as in (22).

(22) a. Unlicensed nominal   [voha] [ilay vavy] ☹

      b. Local Dislocation   [voha + ilay] [..vavy] ☺

      c. Sprouting   [voha + **{COR, NAS}** + ilay] [..vavy]

      d. Surface form   voha**n**'ilay vavy

- When the preceding segment is a non-continuant consonant, both features cannot be realized without disrupting Malagasy CV syllable structure.

- Only the CORONAL feature survives and surfaces as the CORONAL vowel /i/, as in (23).[4]

(23)   a. Unlicensed nominal   [tongotr] [ny zaza] ☹

     b. Local Dislocation   [tongotr + ny] [..zaza] ☺

     c. Sprouting   [tongotr + **{COR, N̶A̶S̶}** + ny] [..zaza]

     d. Surface form   tongot**ry** ny zaza

7   Some Remaining Questions

7.1   Generalizing N-bonding

- If head-head adjunction configurations feed N-bonding, then we expect to find other places where N-bonding occurs.

- Preliminary data from *linking compounds* (Ntelitheos 2012) supports this proposal. But, other types of compounds also need to be considered.

7.2   Phonological Variation

- A more detailed analysis of the phonological constraints and ordering of operations is required to understand the variation of the N-bonding element.

- This is especially relevant for final syllables *-ka* and *-tra*.

- In some cases, neither *y* nor *n* surfaces in constructions where N-bonding is expected. An example is shown below in (24):

(24)   a. Fántatra olona   ny   tranoko.
          PV.know   person DET   house.of.mine
          'My house is known by people.'
     b. *Fántat**ry** olona ny tranoko.

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[4]See Erwin 1996 for discussion on epenthetic final vowels.

- A similar puzzle is found for pronouns:

- Descriptions of Malagasy usually indicate a genitive pronoun series which alternates between two forms: one with an initial *n-* and another without the initial *n-*, as shown in Table 1.

	Nominative	Accusative	Genitive
1st SG	aho	ahy	-ko/-o
2nd SG	ianao	anao	-nao/-ao
3rd SG	izy	azy	-ny
1st PL Incl	isika	antsika	-ntsika/-tsika
1st PL Excl	izahay	anay	-nay/-ay
2nd PL	ianareo	anareo	-nareo/-areo
3rd PL	izy (ireo)	azy (ireo)	-ny/izy ireo

Table 1: Malagasy pronoun series

- The current analysis would account for this alternation by proposing that there is only one underlying form of the pronouns, namely the one without the initial *n-*, and that the initial *n-* is in fact the N-bonding element which surfaces only under the right phonological conditions.

- However, examples like that in (25) require an explanation for why neither the *n* nor *y* surfaces.

(25) a. *tongo-tsika [tongotr-tsika]
          foot-1PL.IN

          'our feet'

      b. *tongotri-tsika

      c. ✓ *tongo-ntsika

8 Summary and Conclusions

8.1 Summary

- **N-bonding:** can be described as a reflection of a head-head adjunction configuration.

  - **Local Dislocation:** creates head-head adjunction which is used in Malagasy to post-syntactically license a nominal that could not be licensed via structural licensing mechanisms.

  - **Sprouting:** head-head configuration then feeds a morphological operation which *sprouts* the N-bonding element.

– **Variation:** *n* and *y* as the surface forms of the N-bonding element is accounted for under the assumption that N-bonding sprouts as a bundle of features {COR, NAS}; a subset of these features surfaces depending on surrounding phonological context.

- **What we get:**

  – A unified account of N-bonding under a licensing approach across both the verbal and nominal domain.

  – Supporting evidence for the absence of abstract genitive case (Pearson 2005).

  – A preliminary phonological analysis to account for the variation in N-bonding and simplifies the distribution of bound pronouns in Malagasy.

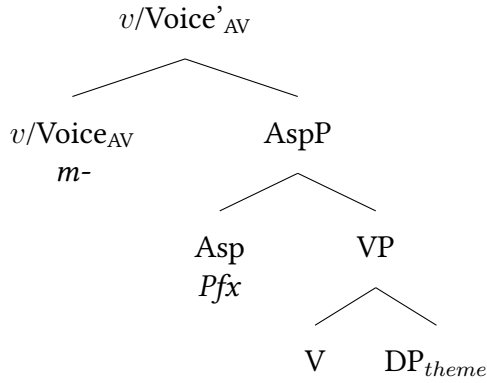## 8.2   Implications and Future Directions

- It has been previously proposed that languages may have licensors that become active only when their inactivity would cause a nominal to go unlicensed (see e.g. Kalin 2018).

- Current analysis: Malagasy isn't equipped with enough structural licensors.

- What about other languages that also use alternative licensing strategies (e.g. Balinese)?

- It will be interesting to see the distribution of languages that do or do not make use of licensing alternatives and whether they share properties in terms of which licensors are or are not available.

- Another area to investigate is whether operations other than N-bonding exist to signal a head-head adjunction configuration.
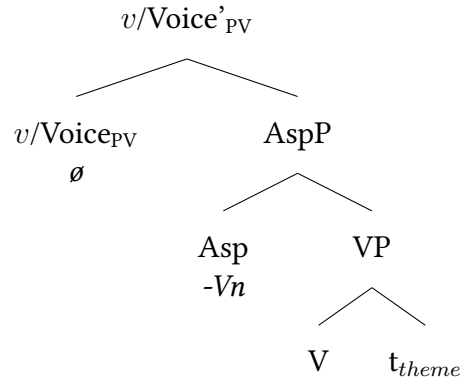
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10   Appendix A: Situating Voice Morphemes

(26)   a. Agent Voice   b. Patient Voice

```
           v/Voice’AV                                        v/Voice’PV
          /         \                                       /          \
    v/VoiceAV        AspP                             v/VoicePV         AspP
      m-            /    \                               ø             /    \
                 Asp      VP                                        Asp      VP
                 Pfx     /  \                                       -Vn     /   \
                        V    DPtheme                                       V    ttheme
```

c. Circumstantial Voice

```
           v/Voice’CV
          /         \
    v/VoiceCV        ApplP
       ø            /     \
                 tAppl     Appl’
                          /     \
                       Appl      AspP
                       -na      /    \
                              Asp      VP
                              Pfx     /  \
                                     V    DPtheme
```