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Malagasy extraposition

Evidence for PF movement

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Abstract Extraposition is the non-canonical placement of dependents in a right-peripheral position in a clause. The Austronesian language Malagasy has basic VOXS word order, however, extraposition leads to VOSX. Extraposed constituents behave syntactically as though they were in their undisplaced position inside the predicate at both LF and Spell Out. This paper argues that extraposition is achieved via movement at Phonological Form (PF). I argue against alternatives that would derive extraposition with syntactic A' movement or stranding analyses. Within a Minimalist model of grammar, movement operations take place on the branch from Spell Out to PF and have only phonological consequences.

Keywords Malagasy · Extraposition · Movement · Phonological Form · Word order

1 Introduction

Extraposition—the non-canonical placement of certain constituents in a right-peripheral position—has been investigated in detail in only a small number of languages. There is a considerable literature for English, SOV Germanic languages German and Dutch, and the SOV language Hindi-Urdu. The construction has not been widely explored in other, typologically distinct languages. This lacuna means that we have probably not seen the full range of options and have also not tested proposed analyses in the widest possible way. The goal of this paper is to investigate in some detail extraposition in Malagasy, an Austronesian language with basic VOXS word order spoken by approximately 17 million people on the island of Madagascar. Extraposition in Malagasy is particularly salient because it places elements in the clause-final position following the subject, resulting in VOSX word order. Despite

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the typological differences between Malagasy and better studied languages, familiar patterns and grammatical behavior appear.

There are a number of phenomena that can be characterized as having a constituent in a position farther to the right than its canonical position, typically right-peripheral. They all often go by the name of extraposition in the literature, although I will assume that they do not necessarily have the same analysis (McCloskey 1999; Sheehan 2010; Crysmann 2013; Baltin 2017). Using English for illustration, we can identify three such constructions:

(1) a. Sandy complained yesterday [that they were not prepared].
b. A man walked in [who was wearing a red hat].
c. A review appeared [of Chomsky's new book].
d. Bob put on the table [all the gifts that his wife insists that they will have to return].

In (1a), a complement to the matrix predicate appears farther to the right than what we consider to be its base position. I will call this SIMPLE EXTRAPOSITION. In (1b) and (1c) a relative clause and a PP complement, respectively, are extraposed from an NP. The latter two go by the name of EXTRAPOSITION FROM NP. Finally, (1d) illustrates HEAVY XP SHIFT, the displacement of a phonologically heavy constituent to the right periphery. The focus in this paper is on simple extraposition in Malagasy.

Malagasy has predicate-initial and subject-final word order. Basic word order in a transitive clause is VOS. When additional dependents are present, the canonical word order is VOXS, where X may be other arguments of the verb or adverbials of various kinds, (2a). In most cases, elements that occur in the X slot may optionally occur to the right of the subject, yielding VOSX order, (2b) (Rajaona 1972; Raoniarisoa 1990; Pearson 2001).

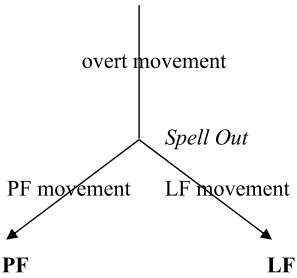
(2) a. Nametraka voninkazo teo ambonin' ny latabatra i Koto
PAST.put flower LOC on DET table Koto
b. Nametraka voninkazo i Koto teo ambonin' ny latabatra
PAST.put flower Koto LOC on DET table
'Koto put flowers on the table.'

I will call elements that appear to the right of the subject EXTRAPOSED CONSTITUENTS (EXPS) and the construction EXTRAPOSITION (EX), without making a claim regarding the analysis. Constituents of interest in extraposed or unextraposed positions will typically be bracketed or underlined.

This paper considers the mechanism behind extraposition in Malagasy and argues that EXPs obtain their clause-final position via PHONOLOGICAL or PF MOVEMENT. In a minimalist Y-Model of grammar (Chomsky 1995), movement can take place on three branches of the derivation in (3). Overt movement takes place prior to Spell Out. Covert or LF Movement is movement that occurs on the branch of the derivation from Spell Out to Logical Form (LF). Finally, PF Movement is movement that takes place on the branch of the derivation from Spell Out to PF.[1]

[1] I adopt the Y-model for ease of exposition, as it provides a clear visualization of what PF movement might be and when it occurs (see Sect. 6 for further discussion). In a Single Output Syntax model (Bobaljik 2002,

(3)



This paper argues that Extraposition in Malagasy is best analyzed as PF movement, a suggestion first made for the language in Law (2007). The idea that extraposition does not involve syntactic movement is not new. It goes back to Rochemont's (1978) "stylistic rules" and has been suggested in various works by Chomsky (1986, 1995). At the same time, there is still considerable debate about the analysis of extraposition and how PF movement should be implemented, and this paper is a contribution to those discussions.

The paper is structured as follows: Sect. 2 presents a more detailed picture of Malagasy VXS clause structure and extraposition. Sections 3 and 4 explore the structural position of extraposed elements. Section 3 considers the Logical Form (LF) of extraposition and argues that, for a number of phenomena, extraposed phrases in VSX word order behave as though they are in their base position at LF, not in an extraposed position following the subject. That is, they show what I call TOTAL RECONSTRUCTION. This is an observation that recurs in much of the extraposition literature, particularly on German and Dutch (e.g. Büring and Hartmann 1997; de Vries 2002, and others). Section 4 tries to answer the further question of where extraposed constituents are at Spell Out. It concludes that EXPs are in their base position at Spell Out as well. This conclusion is not compatible with an overt movement analysis of extraposition. At the same time, a syntactic analysis which has EXPs in their base position and derives extraposition word orders through movement of other elements away from EXP is also not tenable, as Sect. 5 shows. Such stranding analyses (Kayne 1994; Sheehan 2010) are able to derive the appropriate word order in the basic cases but are not consistent with Malagasy clause structure and make incorrect predictions elsewhere. If EXPs are in their base position at Spell Out and LF, this leads to the conclusion that extraposition is not taking place in the narrow syntax at all, but on the branch between Spell Out and PF. Section 6 offers such a PF movement account developed within the context of Optimality Theory.

2 Malagasy syntax

This section presents my assumptions about Malagasy clause structure and gives basic information about extraposition.

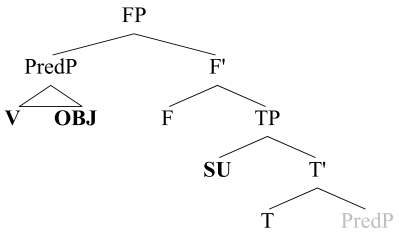
others), PF and LF are identical and constitute the single endpoint of the syntactic derivation. I believe that what I conclude below could be implemented in this architecture as well.

2.1 Clause structure

There is still considerable debate regarding the structure of Malagasy VXS clauses in the generative literature. There are two related issues: 1) the status of the clause-final DP that I have been calling the subject and 2) the derivation of predicate-initial word order. Regarding the first issue, the earlier, more conservative, approach assumes that the clause-final element is a genuine subject. This view is taken in work by traditional grammarians (e.g. Rahajarizafy 1960 and Rajemisa-Raolison 1969) as well as in much generative work (Keenan 1976, 1995; Randriamasimanana 1986; Guilfoyle et al. 1992; and Paul 2000, among others). The alternative view is that the clause-final DP is not a subject but a topic in an A' position. Pearson (2001, 2005) contain the most articulated defense of this position. I will not take a stand on this issue but continue to call this DP the subject and place it in a specifier position. Whether this specifier is an A or an A' position is not relevant.

The second issue concerns the derivation of VXS word order. A wide range of evidence (Keenan 1976, 1995) demonstrates that the verb and all following complements and adjuncts up to the subject form a constituent, which I will call the predicate. Malagasy is thus better described as a predicate-initial, subject final language, as non-verbal clauses also show this predicate-initial, subject final order. Early approaches to Malagasy word order (Guilfoyle et al. 1992; Paul 2000) placed the subject in a rightward specifier, which permitted non-subject material to be initial in the clause. More recent work derives predicate-initial word order via PREDICATE FRONTING (Cole and Hermon 2008, others; see Chung 2017 for critical discussion). The underlying word order is SVO and VOS is derived by leftward movement of a constituent containing the verb and object:

(4)



Specific analyses cited above differ regarding the position of the subject, the syntactic category of the fronted predicate, and its landing site. For concreteness, I assume that the subject is in spec,TP and that the predicate, represented as PredP, fronts to a specifier position above TP. Particular labels of the projections are not crucial in any of the argumentation that follows.[2]

[2]The predicate fronting operation is not well understood but it appears to have properties different from VP/Predicate Fronting in English. The latter is known to affect scope relations by restricting the scope of VP-internal elements (Huang 1993; Sauerland and Elbourne 2002). Malagasy predicate fronting does not have such an effect, perhaps because it is obligatory (but see Pearson 2017 for an apparent case where predicate fronting does not take place). I will assume that predicate fronting is "undone" at LF and that PredP reconstructs to its base position (Massam 2000; Potsdam 2007; Cole and Hermon 2008).

2.2 Extraposition

Although basic word order in Malagasy is VOXS as expected for a predicate-initial language, VOSX word order with constituents following the subject as a result of extraposition is quite free, with few exceptions. To summarize the basic patterns illustrated below: extraposition is impossible for objects, obligatory for dependent clauses with an overt subject, and optional for other elements.

Only nominal objects are systematically prohibited from extraposing. VSO word order is impossible, (5).

(5) Namono (ny akoho) Rasoa (*ny akoho)
PAST.kill DET chicken Rasoa DET chicken
'Rasoa killed the chicken.'

In contrast to nominal objects, full clausal objects must extrapose, (6) (Keenan 1976; Pearson 2001; Law 2007; Potsdam and Polinsky 2007, and others). By full clause, I mean a finite clause that contains an overt subject.

(6) Manantena (*fa hividy fiara aho) Rabe (fa hividy fiara aho)
PRES.hope that buy car 1SG.NOM Rabe that buy car 1SG.NOM
'Rabe hopes that I will buy a car.'

Clausal adverbials introduced by subordinating conjunctions such as *satria* 'because', *raha* 'if', or *rehefa* 'when', as in (7), also must extrapose.

(7) Handeha (*rehefa tafaverina ny raiko) Rabe (rehefa tafaverina ny raiko)
FUT.go when return DET father.1SG Rabe when return DET father.1SG
'Rabe will leave when my father returns.'

Clausal extraposition is optional if the clausal constituent—complement or adjunct—lacks an overt subject. (8) illustrates for the canonical case of reduced clauses: controlled clauses (see Keenan 1976; Law 1995; Polinsky and Potsdam 2005; Potsdam and Polinsky 2007, among others). The generalization also covers other subjectless clauses not shown: existential clauses, topic drop clauses, relative clauses, and ECM clauses.

(8) a. Manantena (hianatra teny anglisy) Rabe (hianatra teny anglisy)
PRES.hope FUT.learn language English Rabe FUT.learn language English
'Rabe hopes to learn English.'

b. Mianatra mafy (mba hahazo karama be) ilay mpianatra (mba hahazo karama be)
PRES.study hard COMP.IRR FUT.get wages big DEM student COMP.IRR FUT.get wages big
'The student studies hard in order to earn a big salary.'

In other cases, extraposition is optional. This includes all kinds of PP complements, including locatives, (9a), and recipients, (9b). It also includes adverbials, such as VP-adverbs, (10a), and S-adverbs, (10b).

(9) a. Nitoetra (tamin' ity trano ity) nandritran' ny raopolo taona ry
PAST.live PREP DEM house DEM during DET twenty year DET
Ratsimba (tamin' ity trano ity)
Ratsimba PREP DEM house DEM
'The Ratsimbas lived in this house for twenty years.'

b. Nanome vola (ho an-dRabe) aho (ho an-dRabe)
PAST.give money PREP PREP-Rabe 1SG PREP PREP-Rabe
'I gave money to Rabe.' (Kalin 2009:36, (56a,b))

(10) a. Namono akoho (tamin-katezerana) ny mpamboly
PAST.kill chicken PREP-anger DET farmer
(tamin-katezerana)
PREP-anger
'The farmer killed the chickens angrily.'

b. Tsy mandamina ny trano (matetika) Rakoto (matetika)
NEG PRES.arrange DET house often Rakoto often
'Rakoto generally does not put the house in order.'

To summarize, extraposition is quite freely available for all kinds of constituents—both complements and adjuncts. It is obligatory for full clauses and impossible for objects. I return to an analysis of these patterns, summarized below, in Sect. 6.

(11) Malagasy simple extraposition patterns
a. impossible: nominal complements
b. obligatory: clauses with overt subjects
c. optional: PP complements, adverbials, clauses without overt subjects

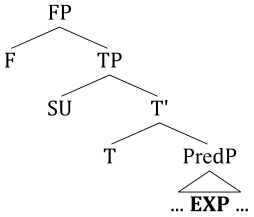
3 Total reconstruction of extraposed constituents

Having presented a basic empirical picture of Malagasy extraposition, I begin the investigation of the syntax of extraposition. I first consider the LF of extraposition structures. This section shows that extraposed constituents behave syntactically as though they are in their base position inside the predicate at LF. That is, syntactically, X in VSX behaves exactly the same as X in VXS. I will call this constellation of facts TOTAL RECONSTRUCTION, following Sauerland and Elbourne (2002). With total reconstruction, EXP is interpreted in its base position inside PredP, which has itself reconstructed into its base position. This is illustrated in the LF in (12). EXP is inside the predicate and is c-commanded by the subject, object, and any other predicate-internal material.

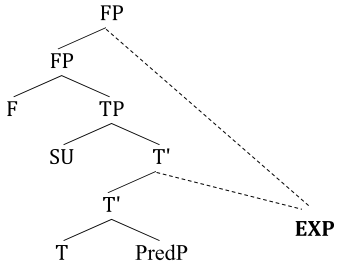
I contrast the total reconstruction claim with the reasonable hypothesis that the extraposed element is syntactically in a right-peripheral position at LF. (13) illustrates such an alternative, with EXP in a rightward EXTRAPOSED POSITION outside of PredP. The crucial characteristic of this LF is that EXP is outside the predicate. In

such a position, EXP will evidence syntactic behavior distinct from that seen when it is inside PredP. Adjoined to FP, it is c-commanded by neither the subject, the object, nor other predicate-internal material. Adjoined to T', it would be c-commanded by the subject, but would not be c-commanded by the object or other predicate-internal material.

(12) TOTAL RECONSTRUCTION LF



(13) EXTRAPOSED POSITION LF



What follows is a set of arguments showing that, despite the word order, total reconstruction in (12) provides a superior understanding of a piece of the syntax of Malagasy extraposition. Extraposition is not represented at LF. The specific arguments from binding theory, variable binding, and NPI licensing are summarized in (14).

(14) Total reconstruction facts

a. EXPs require reconstruction for Binding Principle C (Sect. 3.1)
b. EXPs can contain a bound variable pronoun bound by the subject or object (Sect. 3.2)
c. EXPs are licensed as NPIs (Sect. 3.3)

Each of these phenomena shows that EXP can be interpreted in its base position; (12) is a required LF for extraposition. If one further assumes that extraposition has a single, uniform representation at LF, then the arguments rule out an extraposed position LF, (13). If a single extraposition example were allowed to have both LF structures, then the argument from Principle C (Sect. 3.1) is crucial because the availability of the extraposition LF would make incorrect predictions, even if the total reconstruction LF is also possible. Thus, it argues in favor of (12) and rules out (13). The results hold for both obligatory extraposition of CPs and optional extraposition of PPs.

The conclusion of this section is stated in (15). It is an empirical result that will ultimately need to be accounted for and reconciled with the observed word order. This finding regarding Malagasy is not exceptional in the literature on extraposition.

It builds on argumentation in Büring and Hartmann (1997), among others, which reaches a similar conclusion for German.

(15) Extraposed constituents behave as though they are in their base position at LF

3.1 Binding principles

The first argument for total reconstruction, also developed for German in Büring and Hartmann (1997), comes from Principle C of the Binding Theory (Chomsky 1981), which states that an R-expression must be free. The relevant empirical observation is that a name embedded in a PP or CP triggers Principle C effects with respect to a pronominal subject, (16), or pronominal object, (17), regardless of whether the PP/CP constituent is extraposed or not. The ungrammaticality of (16b) and (17b) can be attributed to a Principle C violation: the pronominal subject or object, respectively, c-commands the coindexed name inside the PP. The examples in (16a) and (17a) serve as baseline cases, showing that there is nothing otherwise wrong with the examples if the Principle C violation is removed by reversing the positions of the pronoun and the R-expression.

(16) a. Namangy ahy (tamin' ny fitsingerin'ny andro nahateraha-**ny$_i$**)
PAST.visit 1SG.ACC PREP DET birthday-**3SG.GEN**
Rabe$_i$ (tamin' ny fitsingerin'ny andro nahateraha-**ny$_i$**)
Rabe PREP DET birthday-**3SG.GEN**
'Rabe$_i$ visited me on his$_i$ birthday.'

b. *Namangy ahy (tamin' ny
PAST.visit 1SG.ACC PREP DET
fitsingerin'ny andro nahaterahan-**dRabe$_i$**) **izy$_i$** (tamin' ny
birthday-**Rabe** **3SG.NOM** PREP DET
fitsingerin'ny andro nahaterahan-**dRabe$_i$**)
birthday-**Rabe**
'*He$_i$ visited me on Rabe$_i$'s birthday.'

(17) a. Nampahatsiahy **an-dRabe$_i$** (momba ny fivoria-**ny$_{i,k}$**) aho
PAST.remind **ACC-Rabe** about DET meeting-**3SG.GEN** 1SG.NOM
(momba ny fivoria-**ny$_{i,k}$**)
about DET meeting-**3SG.GEN**
'I reminded Rabe$_i$ about his$_{i,k}$ meeting.'

b. Nampahatsiahy **azy$_{*i,k}$** (momba ny fivorian-**dRabe$_i$**) aho
PAST.remind **3SG.ACC** about DET meeting-**Rabe** 1SG.NOM
(momba ny fivorian-**dRabe$_i$**)
about DET meeting-**Rabe**
'I reminded him$_{*i,k}$ about Rabe$_i$'s meeting.'

The observation holds for CP extraposition as well. The pronominal subject in (18) triggers a Principle C violation with the R-expression *Rabe* inside the extraposed CP, and the pronominal object in (19b) does the same.

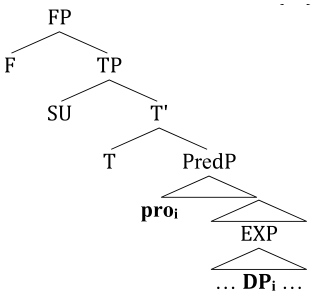
(18) *Nilaza **izy$_i$** fa nahandro trondro **Rabe$_i$**
PAST.say **3SG.NOM** that PAST.cook fish **Rabe**
'*He$_i$ said that Rabe$_i$ cooked fish.' (Law 2007:778, (22a))

(19) a. Nampahatsiahy **an-dRabe$_i$** aho fa efa nahita **azy$_{i,k}$** Rasoa
PAST.remind **ACC-Rabe** 1SG that PFV PAST.see 3SG Rasoa
'I reminded Rabe$_i$ that Rasoa already saw him$_{i,k}$.'

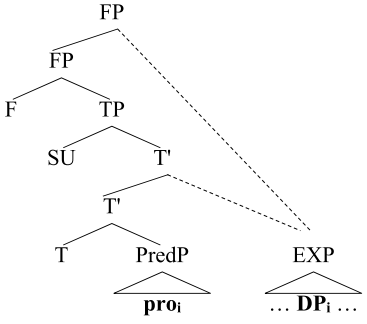
b. Nampahatsiahy azy$_{*i,k}$ aho fa efa nahita **an-dRabe$_i$** Rasoa
PAST.remind **33SG.ACC** 1SG that PFV PAST.see **ACC-Rabe** Rasoa
'I reminded him$_{*i,k}$ that Rasoa already saw Rabe$_{*i}$.'

I assume that Principle C is evaluated at LF (Chomsky 1995). Consequently, the data indicate that the extraposed element must be below the subject and object in order to trigger a Principle C violation. This obtains if EXP is in its base position. Take the data in (17b) and (19b) in which an object pronoun appears to trigger a Principle C violation with respect to an R-expression inside EXP. The LFs for the two approaches under consideration are schematized in (20) and (21), where pro is the object pronoun inside the predicate and DP is the name inside the extraposed constituent. There is the desired Principle C violation in (20) under total reconstruction, but not with the EXP located in the extraposed position, (21). In (21), the pronoun does not c-command DP. These data thus show that not only can the extraposed element be interpreted in its base position, but it must be, in order for Binding Theory to rule out the ungrammatical examples. If EXP could be in a rightward position at LF, (21), the b examples above should be grammatical.

(20) TOTAL RECONSTRUCTION LF



(21) EXTRAPOSED POSITION LF



3.2 Variable binding

The second illustration of total reconstruction comes from variable binding, a diagnostic again used in Büring and Hartmann (1997) for German, as well as Bayer (1997) for Bengali, Bayer (1997) and Mahajan (1997) for Hindi, and de Vries (2002) for Dutch. A pronoun inside an extraposed constituent may be construed as a bound variable. This result holds for both optional PP extraposition and obligatory CP extraposition. It also holds whether the binder is the subject or the object.

I first illustrate the pattern with PP extraposition. In (22), an extraposed PP contains a pronoun bound by the quantified subject noun phrase *ny zaza rehetra/tsirairay* 'every/each child'. In (23), the pronoun is bound by a quantified object, *ny zazakely tsirairay* 'each child'.

(22) Nametraka vary (tao anatin' ny vilia-**ny$_i$**) **ny zaza**
PAST.put rice LOC inside DET plate-**3SG.GEN** **DET child**
rehetra/tsirairay$_i$ (tao anatin' ny vilia-**ny$_i$**)
all/each LOC inside DET plate-**3SG.GEN**
'Every/each child put rice on his plate.' (after Kalin 2009:31)

(23) Nametraka **ny zazakely tsirairay$_i$** (teo ambonin' ny fandria-**ny$_i$**)
PAST.put DET child each LOC in DET bed-**3SG.GEN**
ny mpitsabo (teo ambonin' ny fandria-**ny$_i$**)
DET nurse LOC in DET bed-**3SG.GEN**
'The nurse put each child$_i$ in his$_i$ bed.'

The data below show the same pattern with obligatory CP extraposition (see Zribi-Hertz and Mbolatianavalona 1999 and Law 2007). A pronoun inside the CP can be bound by a quantified subject, (24), or a quantified object, (25).

(24) Manantena **ny zazalahy tsirairay$_i$** fa hanoroka **azy$_i$** Rasoa
PRES.hope DET boy each that FUT.kiss 3SG.ACC Rasoa
'Each boy$_i$ hopes that Rasoa will kiss him$_i$.'

(25) Niteny tamin' **ny zazalahy tsirairay$_i$** aho fa hanoroka **azy$_i$**
PAST.say PREP DET boy each 1SG that FUT.kiss 3SG.ACC
Rasoa
Rasoa
'I told each boy$_i$ that Rasoa will kiss him$_i$.'

On the assumption that a bound variable interpretation of a pronoun requires c-command at LF, such data require that extraposed elements be able to be in their base position at LF. Both the subject and direct object apparently c-command into extraposed PPs and CPs. In an extraposed position, binding into the extraposed phrase is not uniformly expected, as we saw with the Principle C data. In particular, binding by an object is excluded.

3.3 NPI licensing

The final argument for total reconstruction comes from negative polarity item (NPI) licensing. It is widely agreed that NPIs require a licenser such as negation,

and the NPI must be in the scope of the licenser (Klima 1964; Ladusaw 1979; Linebarger 1987; Laka 1994; Hoekstra 1991; McCloskey 1996; Merchant 2000, others; and Hoeksema 2000 for additional considerations):

(26) An NPI must be in the scope of its licenser (Merchant 2000:147)

This is true for Malagasy (see Paul 2005). First, a licenser like negation is required:

(27) *(**Tsy**) nandroso vary tamin' **na iza na iza**[3] aho
NEG PAST.serve rice PREP **or who or who** 1SG.NOM
'I didn't serve rice to anyone.'

Second, c-command is required. I assume that negation is inside the predicate as coordination data, (28), shows that negation forms a constituent with the predicate. This accounts for the fact that NPIs may not appear in subject position because they are not c-commanded by negation, (29).

(28) [Tsy mety] sy [tsy mifanaraka amin' ny lalana] ny ataony
NEG PRES.right and NEG PRES.agree PREP DET law DET do.PASS.3SG
'What he does is not right and does not follow the law.'

(29) ***Tsy** nanongo an' i Koto **n'iza n'iza**
NEG PAST.pinch ACC Koto **anyone**
('No one pinched Koto.') (Paul 2005:363, (13a))

It is less clear at what point in the derivation NPIs must be licensed. Linebarger (1987), Mahajan (1990b), Uribe-Etxevarria (1994), Giannakidou (1998) and others argue that NPIs must be in the scope of their licenser at LF. I will temporarily adopt this position, in keeping with minimalist assumptions that syntactic principles apply only at the interfaces, LF and PF.

NPIs appear in predicate-internal constituents, and such constituents may extrapose, (30).[4]

(30) a. **Tsy** nandroso vary (tamin' **n'iza n'iza**) i Sahondra (tamin' **n'iza n'iza**)
NEG PAST.serve rice PREP anyone Sahondra PREP anyone
'Sahondra didn't serve rice to anyone.'

[3]NPIs in Malagasy are formed by reduplication of the sequence *na* 'or' plus a *wh*-phrase (Paul 2005).

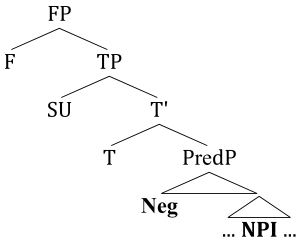
[4]It is difficult to show that a CP containing an NPI can extrapose as my consultants disliked cross-clausal NPI licensing configurations. Two consultants accepted an NPI in the complement of a Neg Raising verb, (i). In such a case, extraposition is still possible and required because the complement is a CP.

(i) %Tsy mino aho fa marary **velively** izy
NEG PRES.believe 1SG.NOM that sick at.all 3SG.NOM
'I don't believe that he is sick at all.'

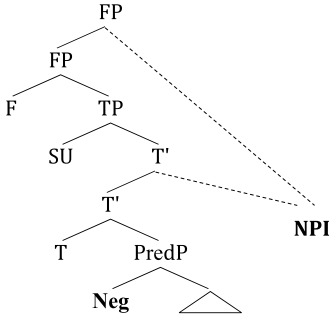
b. **Tsy** hitako (**n'aiza n'aiza**) ny ondriko
NEG PRES.find.PASS.1SG anywhere DET sheep.1SG
(**n'aiza n'aiza**)
anywhere
'I didn't find my sheep anywhere.'

The extraposed NPI behaves as though it is in its base position inside the predicate, where it would be licensed, as seen in the total reconstruction LF in (31). In an extraposed position, the NPI is not c-commanded by negation, (32). NPI licensing thus further supports the total reconstruction LF.

(31) TOTAL RECONSTRUCTION LF



(32) EXTRAPOSED POSITION LF



To summarize, data from binding theory, variable binding, and NPI licensing show that extraposed elements behave no differently than unextraposed elements with respect to these phenomena. In other words, extraposed constituents behave as though they are in their base position at LF. This conclusion about extraposed constituents runs through a good portion of the relevant literature on extraposition (see, for example, Kayne 1994; Büring and Hartmann 1997; de Vries 2002; Sheehan 2010) and is replicated in Malagasy.[5]

[5] An additional argument for total reconstruction is available based on scope, an argument also developed in Büring and Hartmann (1997) and de Vries (2002) for German and Dutch, respectively. The observation is that quantificational phrases show the same scope options whether they are in their base position or extraposed position. This fact follows easily from total reconstruction but is not compatible with an extraposed position LF. Space considerations prevent me from presenting the details.

4 An overt movement analysis

With reference to the Y-model of grammar in (3), Sect. 3 concluded that EXPs are in their base position at LF. In contrast, the observed word order shows that EXPs are in some right peripheral position at PF. This section explores where EXPs are in between these two levels, at Spell Out. Given the Y-model, answering this question will isolate where in the derivation extraposition is taking place. This section considers and rejects an overt movement analysis of extraposition, which would have EXPs in a derived position at Spell Out. Argumentation indicates that EXPs are in their base position at Spell Out, (33).

(33) Extraposed constituents behave as though they are in their base position at Spell Out

The literature offers no shortage of syntactic approaches to extraposition. The main ones are (rightward) A' movement, base generation, ellipsis, and stranding. They are given in (34), with selected references.

(34) Analytical approaches to extraposition

a. A' movement (Baltin 1978; Müller 1995; Büring and Hartmann 1997; Overfelt 2015)

b. base generation (Culicover and Rochemont 1990)

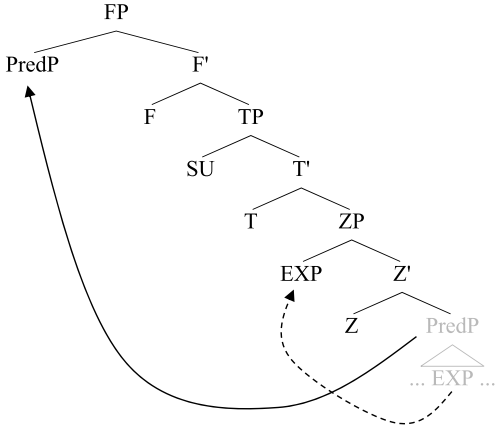
c. ellipsis (de Vries 2002, 2009)

d. stranding (Kayne 1994; Barbiers 1995; Wilder 1996; Sheehan 2010)

I develop a canonical A' movement analysis in which EXPs move to a right-peripheral, predicate-external syntactic position. This has been the dominant approach, dating back to Ross (1967) and Baltin (1978) and is recently defended for German in Büring and Hartmann (1997). I present arguments from NPIs, extraction, and locality against such an analysis for Malagasy.

Given the predicate fronting derivation for a Malagasy clause in (4), an extraposing element inside the predicate could move to right adjoin as high as FP or as low as T' to place it in a right-peripheral position after the subject. Alternatively, EXP could move leftward to adjoin, or substitute into a specifier, below the subject. This too would place EXP in a linear position to the right of the subject. I will adopt this variant of the analysis (see Pearson 2001; Kalin 2009) because it is compatible with claims that rightward movement does not exist and obviates this argument against an A' movement analysis of extraposition (Zwart 1994). For concreteness, I show EXP in the specifier of a projection outside the predicate but below that housing the subject. The predicate then fronts to spec,FP after movement of EXP:

(35) Overt movement analysis of Malagasy extraposition



In order to account for the total reconstruction facts, the A' movement analysis must continue to assume that PredP obligatorily reconstructs and that EXP also obligatorily reconstructs into PredP, ending up back in its base position at LF. On this view, the movement analysis accounts for most of the total reconstruction facts in (14). In particular, it will account for the Principle C and variable binding data, on the assumption that the principles governing these phenomena are evaluated at LF. The NPI facts require further discussion (Sect. 4.2). They provide an argument against this analysis, which is supplemented by arguments from extraction (Sect. 4.1) and locality (Sect. 4.3).

4.1 Extraction

Law (2007) gives an argument for Malagasy extraposition being non-syntactic movement based on the possibility of extraction from extraposed constituents. The transparency of extraposed constituents to subextraction is also seen in German (Büring and Hartmann 1997) and Irish (McCloskey 1999). I develop this argument with respect to two Malagasy movement constructions, the cleft construction and subject-to-subject raising out of finite clauses. These exemplify A'-movement and A-movement, respectively.

The cleft construction in Malagasy is used for both focus and *wh*-questions and is formed by fronting an element to a clause-initial position followed by the focus particle *no*, glossed 'FOC'. Clefting in Malagasy is restricted in that only adjuncts and matrix subjects can be directly clefted (Keenan 1976, 1995; Paul 2000, 2001a; Pearson 2001; Sabel 2002; Kalin 2009, and others):

(36) a. Manasa lamba Rakoto
PRES.wash clothes Rakoto
'Rakoto washes clothes.'

b. Iza no manasa lamba?
who FOC PRES.wash clothes
'Who washes clothes?'

c. Oviana no manasa lamba Rakoto?
when FOC PRES.wash clothes Rakoto
'When does Rakoto wash clothes?'

d. *Inona no manasa Rakoto?
what FOC PRES.wash Rakoto
('What does Rakoto wash?')

In addition to local extraction, adjuncts may also extract long-distance (see Sabel 2007):

(37) Rahoviana$_i$ no mihevitra Rabe fa hividy fiara t$_i$ Rakoto?
when.FUT FOC PRES.think Rabe that FUT.buy car Rakoto
'When does Rabe think that Rakoto will buy a car?'

(37) is necessarily a question about the time of car buying (the embedded event) because the *wh*-word *rahoviana* 'when.FUT' is morphologically marked as future, in agreement with the embedded verb, which is also future/irrealis. The matrix verb is present tense. In other words, the *wh*-phrase originates inside the embedded clause, which is in an extraposed position. The example thus shows that a *wh*-phrase may undergo A'-movement from an extraposed CP.

Subject-to-subject raising out of finite CPs (Keenan 1976) shows that A-movement from an extraposed CP is also possible. Keenan (1976) proposes that a complement clause, as in (38a), can advance to subject position under passive, (38b).

(38) a. Nanantena Rabe fa nanasa lamba Rasoa
PAST.hope Rabe that PAST.wash clothes Rasoa
'Rabe hoped that Rasoa washed clothes.'

b. Nantenain- dRabe fa nanasa lamba Rasoa
PAST.hope.PASS- Rabe that PAST.wash clothes Rasoa
'That Rasoa washed clothes was hoped by Rabe.' (Keenan 1976:285, (115a))

Keenan (1976) argues that (38b) is actually structurally ambiguous, with the two parses in (39). In (39a), the entire CP is the matrix subject. In (39b), the matrix subject is *Rasoa*, which has raised from the subordinate clause, is still in the complement position.

(39) a. Nantenain- dRabe [fa nanasa lamba Rasoa]
PAST.hope.PASS- Rabe that PAST.wash clothes Rasoa

b. Nantenain- dRabe [fa nanasa lamba] Rasoa
PAST.hope.PASS- Rabe that PAST.wash clothes Rasoa
'That Rasoa washed clothes was hoped by Rabe.'

Evidence for this second parse comes from diagnostics showing that *Rasoa* alone can be the matrix subject. First, it can be clefted, (40a), an option available to matrix subjects. Second, it can be preceded by the yes/no question particle *ve* 'Q', (40b). This particle immediately precedes the matrix subject (Keenan 1976, 1995; Paul 2001b). The placement of *ve* in (40b) indicates that *Rasoa* is not part of the embedded clause but is the matrix subject.

(40) a. Rasoa no nantenain- dRabe fa nanasa lamba
Rasoa FOC PAST.hope.PASS- Rabe that PAST.wash clothes
'It was Rasoa that was hoped by Rabe to have washed clothes.' (Keenan 1976:286)

b. Nantenain- dRabe fa nanasa lamba ve Rasoa?
PAST.hope.PASS- Rabe that PAST.wash clothes Q Rasoa
'Was Rasoa hoped to have washed clothes by Rabe?'

Relevant to our concerns is that the complement clause in (40b) from which the subject has raised can be extraposed, (41). The word order unambiguously shows an extraposed CP from which A-movement has taken place.

(41) Nantenain- dRabe ve Rasoa fa nanasa lamba?
PAST.hope.PASS- Rabe Q Rasoa that PAST.wash clothes
'Was Rasoa hoped to have washed clothes by Rabe?'

Subject raising and *wh*-questions collectively suggest that extraposed CPs are transparent to extraction from within them. This is problematic from the perspective of Huang's Condition on Extraction Domain (CED), (42).

(42) *Condition on Extraction Domain* (*CED*) (Huang 1982:505)
A phrase A may be extracted out of a domain B only if B is properly governed.

I assume, along with Law (2007) and Sabel (2002), that Malagasy obeys. Law (2007) reasons that extraction from the CPs above cannot be taking place when the CPs are in the extraposed position, as such extraction would violate the CED. If the CP is in its base position at Spell Out, however, the CED is transparently satisfied. Extraction thus provides an argument that extraposed elements are not displaced at Spell Out.

4.2 NPI licensing

This section discusses the NPI licensing facts from Sect. 3.3 in more detail. They illustrated total reconstruction, and they ultimately also provide a second argument against a movement analysis of extraposition. NPIs are similarly used in Sauerland and Elbourne (2002) to argue for a PF movement analysis of reconstruction facts.

It was already shown in Sect. 3.3 that NPIs licensed by negation must be in the scope of negation, (43), specifically under the assumption that licensing takes place at LF.

(43) An NPI must be in the scope of its licenser

Thus, it might appear that the NPI facts are straightforwardly accounted for under a movement analysis if EXP ultimately reconstructs into its base position. After reconstruction at LF, the NPI will be in the scope of negation.

The difficulty with this explanation is that there is good evidence, at least for English, that NPIs cannot be moved out of the domain that licenses them, (44). That is, NPIs are not licensed under reconstruction.

(44) An NPI may not be moved out of its licensing domain (Merchant 2000:146)

This restriction is often formulated as saying that NPIs are licensed at Surface Structure (Lasnik 1972; Ladusaw 1979; Laka 1994; McCloskey 1996; de Swart 1998, others) as opposed to LF as was assumed in Sect. 3.3. Selected English data from Merchant (2000:146) supporting the generalization are below. An NPI may not be preposed, (45), or passivize, (46). In both cases, the NPIs are moving to positions from which reconstruction should be possible.[6]

(45) a. We didn't hear a single thing.
b. *A single thing, we didn't hear.

(46) a. We didn't expect a single thing from him.
b. *A single thing wasn't expected from him by us.

In a similar vein, Collins and Postal (2014:104-105) shows that in cases where an NPI is licensed in an embedded CP in a Neg Raising context, the containing CP cannot be preposed or passivized as that would result in the NPI being moved out of its licensing domain, (47).

(47) a. Wanda does not believe that Kevin will breathe a word about it.
b. *That Kevin will breathe a word about it, Wanda does not believe.
c. *That Kevin will breathe a word about it was not believed by Wanda.

Given the two relatively uncontroversial assumptions in (43) and (44), the Malagasy NPI extraposition data repeated below are not accounted for by the movement analysis.

(48) a. **Tsy** nandroso vary (tamin' **n'iza n'iza**) i Sahondra (tamin' **n'iza n'iza**)
NEG PAST.serve rice PREP anyone Sahondra PREP anyone
'Sahondra didn't serve rice to anyone.'
b. %**Tsy** mino aho fa marary **velively** izy
NEG PRES.believe 1SG that sick at.all 3SG
'I don't believe that he is sick at all.'

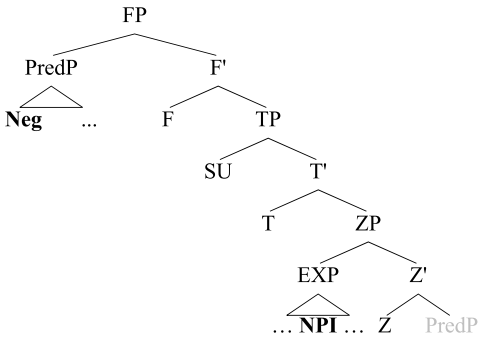
The NPIs are not licensed in a derived extraposed position because negation does not c-command outside of the predicate, as the structure in (49) shows.

[6]Linebarger (1980) gives examples of NPIs that are not licensed at Surface Structure, but that seem to require reconstruction to be licensed, such as (i).

(i) [A doctor who knew anything about acupuncture] was not available. (Linebarger 1980:227)

An anonymous reviewer suggests that such examples are different from the ungrammatical cases above because the bracketed noun phrase containing the NPI can independently reconstruct for scope reasons, to take scope under negation. S/he proposes that NPIs are licensed at LF but can only reconstruct for a non-NPI-related reason. Such an account can extend to the Malagasy data because Sect. 3 demonstrated that EXPs must reconstruct and the movement analysis stipulates this. The Malagasy case is different however in that there is no observable reason, such as scope, for the reconstruction. I leave this alternative available for future investigation. It might weaken the argument against movement based on NPIs.

(49)



Nor is the NPI licensed under reconstruction at LF because that does not seem to be available for NPIs. Consequently, the NPI must be in its base position inside the predicate at Spell Out, contrary to the movement analysis.

Before accepting this conclusion, I present data that confirms that NPIs in Malagasy are subject to (44) and cannot move out of their licensing domain. With respect to A'-movement, an NPI may not be clefted out from a negative clause, (50b), nor can it be topicalized, (50c). The latter construction consists of fronting a phrase followed by the topic particle *dia* (Keenan 1976).

(50) a. Tsy hipetraka [ao aorian' iza n'iza] aho
NEG FUT.sit LOC behind anyone 1SG.NOM
'I will not sit behind anyone.'

b. *[Ao aorian' iza n'iza] no tsy hipetraka aho
LOC behind anyone FOC NEG FUT.sit 1SG.NOM
('*It's behind anyone that I will not sit.')

c. ??Ao aorian' iza n'iza dia tsy hipetraka aho
LOC behind anyone TOP NEG FUT.sit 1SG.NOM
('*Behind anyone, I will not sit.')

NPIs in Malagasy are also not licensed after A-movement, specifically, passive. In (51a), an object NPI is licensed by negation; however, it cannot become the passive subject in (51b).

(51) a. Tsy nividy n'inona n'inona tany an-tsena aho
NEG PAST.buy anything LOC PREP-market 1SG.NOM
'I didn't buy anything at the market.'

b. *Tsy novidi-ko tany an-tsena n'inona n'inona
NEG PAST.buy.PASS-1SG.GEN LOC PREP-market anything
('*Anything wasn't bought by me at the market.')

Malagasy behaves like English then in that NPIs cannot move out of their licensing domain. Consequently, the NPI extraposition data constitute an argument that extraposition cannot be syntactic movement, since NPIs can extrapose. Despite the word order, NPIs show that EXPs are in their base position at Spell Out.

4.3 Non-local extraposition

A final argument against a movement analysis of extraposition comes from locality, an issue also explored with respect to extraposition in at least German (Büring and Hartmann 1997; Crysmann 2013), Dutch (de Vries 2009), and Hindi (Mahajan 1990a). Malagasy extraposition violates the Right Roof Constraint (RRC), a constraint on rightward movement first formulated in Ross (1967), which states that rightward movements are clause-bound:

(52) *Right Roof Constraint* (Baltin 2017)
An element cannot move rightward out of the clause in which it originates

More recent work suggests that the RRC is even more restricted and asserts that the apparent boundedness of rightward movement is a result of cyclicity (see Overfelt 2015 for discussion of the RRC and a proposal regarding its ultimate source). Baltin (1978) gives (53) as illustration. The extraposed CP *that the Mets would lose* originates as the complement of *certain*. Since there is a clause boundary—the complement of the raising predicate *be believed*—between the extraposed CP and its origin site, the RRC is violated and the sentence is ungrammatical.

(53) *John was believed [to be certain *t*] by everybody [$_{CP}$ that the Mets would lose].
(c.f. Everybody believed John to be certain that the Mets would lose.)

Similar examples are readily formed in Malagasy, where extraposition takes place from the complement of a control predicate. (54) illustrates optional phrasal extraposition and (55) illustrates CP extraposition.

(54) a. Manantena [hamangy anao any amin' ny hopitaly
PRES.hope FUT.visit 2SG.ACC LOC PREP DET hospital
(rahampitso)] aho (rahampitso)
tomorrow 1SG tomorrow
'I hope to visit you in the hospital tomorrow.'

b. Manonofy [hanidina (ho any amin' ny volana)] ny mpianatra
PRES.dream FUT.travel PREP LOC PREP DET moon DET student
(ho any amin' ny volana)
PREP LOC PREP DET moon
'The students dream of travelling to the moon.'

(55) a. Mila [mino (*fa ho tonga eo izany)] ianao (fa ho tonga
need believe that IRR arrive LOC DEM 2SG.NOM that IRR arrive
eo izany)
LOC DEM
'You need to believe that it will happen.'

b. Mikasa [hiteny azy (*fa diso izy)] aho (fa
PRES.intend FUT.tell 3SG.ACC that wrong 3SG.NOM 1SG.NOM that
diso izy)
wrong 3SG.NOM
'I intend to tell him that he is wrong.'

Polinsky and Potsdam (2005) gives evidence for the biclausal status of control structures in Malagasy, making these genuine RRC violations. While it is not entirely clear what the source of the RRC is, it seems to be a robust descriptive restriction on rightward movement that does not hold of Malagasy simple extraposition.

To summarize, extraction patterns, NPIs, and locality indicate that an overt movement analysis of Malagasy simple extraposition is untenable. Not only are EXPs in their base position at LF, they are in their base position at Spell Out. The next section considers a different kind of syntactic movement analysis of extraposition that is still compatible with that conclusion.

5 A stranding analysis

Even if EXPs are in their base position at Spell Out, it could still be that extraposed word order is derived in the syntax by movement of other elements away from EXP. Such stranding analyses of extraposition (Kayne 1994; Barbiers 1995; Wilder 1996; Sheehan 2010) have been quite influential since Kayne's (1994) original proposal. That analysis was first applied to relative clause extraposition but has since been extended to simple extraposition. I develop a version of Kayne's analysis as well as a more sophisticated variant from Sheehan (2010) for Malagasy. Such analyses have the strength that they account for the total reconstruction facts because the EXP is in its base position. Nevertheless, I demonstrate that they do not readily work for Malagasy extraposition.

Kayne (1994) was concerned with the analysis of relative clause extraposition as in (56b) and proposes a derivation in which the relative clause *who was wearing a red hat* is stranded in the base position of the subject by movement of *a man* away from the DP in spec,vP, (57). The intuition is that rightward extraposed elements are in fact in their base positions and other material has moved leftward away from them to obtain the observed word order.

(56) a. [A man [who was wearing a red hat]] left.
b. [A man] left [who was wearing a red hat].

(57) $[_{TP}$ [a man]$_i$ [left $[_{vP}$ $[_{DP}$ t_i [who was wearing a red hat]] $[_{v'}$ ...]]]]

Turning to Malagasy, the analysis of CP extraposition as in (58a) would need to proceed as in (58b). The subject is in spec,TP; the predicate phrase, PredP, consists of the verb and its CP complement. In order to obtain the correct word order in (58a) the verb moves to F°, to the left of the subject. The CP complement is stranded in the complement position, as shown.

(58) a. Miteny (*fa hividy fiara ianao) Rabe fa hividy fiara ianao
PRES.say that FUT.buy car 2SG.NOM Rabe that FUT.buy car 2SG.NOM
'Rabe says that you will buy a car.'

b. [$_{FP}$ [$_{F'}$ miteny [$_{TP}$ Rabe [$_{PredP}$ [$_{VP}$ t$_V$ [$_{CP}$ fa hividy fiara
PRES.say Rabe that FUT.buy car
ianao]]]]]]
2SG.NOM

The structure in (58b) is not a predicate fronting derivation of predicate-initial word order adopted earlier, however. In fact, predicate fronting must be prevented from taking place. If PredP were to move to spec,FP in (58b) it would undesirably carry both the verb and the CP to a position preceding the subject, yielding the ungrammatical option in (58a) in which the CP is not clause-final. Instead, head movement of the verb must be posited in (58b), which is otherwise not motivated.

The analysis further fails if the verb has multiple dependents, such as two complements, as in (59a), where the verb *miteny* 'speak' has a PP complement and a CP complement. In this case, a string consisting of the verb plus the first complement, *miteny tamiko* 'PRES.say PREP-1SG', must raise in order to strand the CP, as shown in (59b); however, this string is not a constituent. In general, a simple stranding analysis requires fronting of strings of words that are not predicates and sometimes not constituents. This is not compatible with a predicate fronting derivation of Malagasy clauses.

(59) a. Miteny tami-ko Rabe fa hividy fiara ianao
PRES.say PREP-1SG.GEN Rabe that FUT.buy car 2SG.NOM
'Rabe says to me that you will buy a car.'

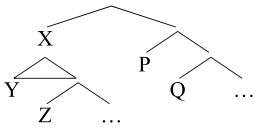
b. [$_{FP}$ miteny tamiko [$_{TP}$ Rabe [$_{PredP}$ ~~miteny~~ [$_{VP}$ [~~tamiko~~]$_{PP}$ [fa hividy fiara ianao]$_{CP}$]]]]

A more promising variant of the stranding approach is to maintain that predicate fronting does take place but is then followed by scattered deletion in the two movement copies (Wilder 1996; Sheehan 2010, 2013; see Pearson 2001 for Malagasy). The most articulated version of such an analysis is Sheehan (2010). I present the relevant details of that analysis as applied to Malgasy and show that, despite its promise, it too ultimately fails.

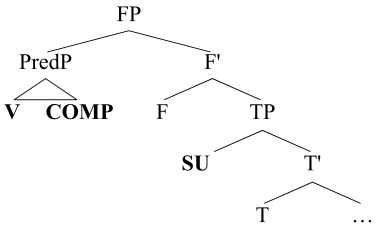
The idea behind the scattered deletion analysis is that movement of the PredP constituent from which extraposition has taken place proceeds normally; however, at the point of Chain Reduction when copies that will not be pronounced are chosen, subparts of individual copies may be targeted for deletion. The challenge for such an approach is to construct a principled analysis of scattered deletion that yields the correct results for the cases of interest but does not wildly overgenerate in other domains. In the vanilla cases of movement, scattered deletion does not apply. Sheehan (2010) proposes such a restrictive theory. Although the analysis was developed for complement extraposition from NP, it can be applied directly to Malagasy simple extraposition.

Sheehan (2010) is concerned with the linearization of structures as in (60), which contains a complex specifier, X. The predicate fronting structure in Malagasy shown in (61) is an instance of this scheme.

(60)



(61)



The core of the analysis is the Simple Linear Correspondence Axiom in (62), a minimalist version of Kayne's (1994) Linear Correspondence Axiom (LCA).

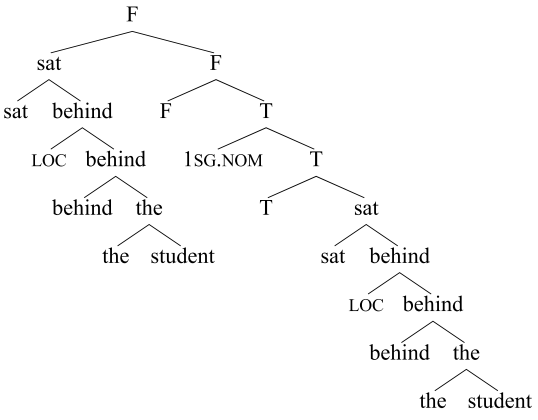
(62) *Simple LCA* (Uriagereka 1999; Sheehan 2010)
α precedes β if α asymmetrically c-commands β

The Simple LCA fails to linearize (60) because no ordering is specified for Y and Z with respect to P and Q. There is no (asymmetric) c-command relationship between Y/Z and P/Q.

Sheehan then provides two ways to linearize the structure, which I will present by directly applying them to the Malagasy extraposition alternation in (63). The syntactic structure after predicate fronting is (64). Following Sheehan (2010), I use bare phrase structure representations. As Sheehan (2013) discusses, structures like (64) cannot be linearized without further manipulation.

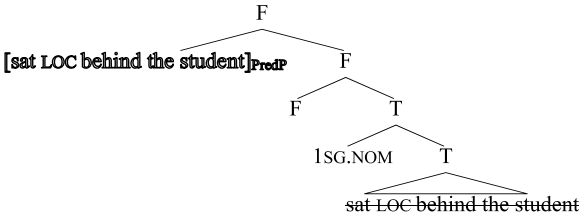
(63) Nipetraka (tao aorian' ny mpianatra) aho (tao aorian' ny mpianatra)
PAST.sit LOC behind DET student 1SG.NOM LOC behind DET student
'I sat behind the student.'

(64)



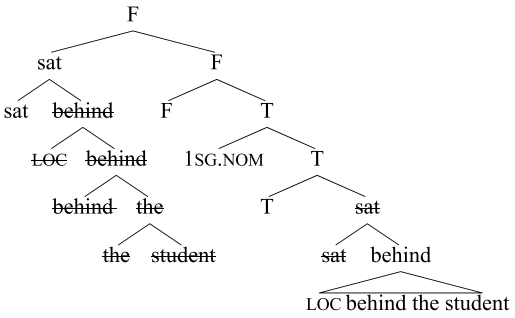
The first method for linearizing (64) is ATOMIZATION. It involves spelling out a subpart of the tree using a version of Uriagereka's (1999) MULTIPLE SPELL OUT. Instead of waiting until the end of the derivation and spelling out the entire structure, individual phrases can be spelled out during the course of the derivation, resulting in them being "atomized" or frozen for the rest of the derivation. Atomization results in the ordering of terminals inside the spelled-out constituent. Those elements can then be ordered with respect to external elements. In (64), the fronted predicate is atomized as in (65) (where the outline font indicates that a constituent has been spelled out). The terminal elements inside the predicate can now be ordered with respect to the subject using the Simple LCA since the predicate as a whole asymmetrically c-commands the subject. Elements inside PredP will precede the subject. This is the derivation of (63) without PP extraposition.

(65)



To derive (63) with PP extraposition, SCATTERED DELETION applies, (66). The PP is pronounced in the base copy while the verb is pronounced in the higher copy.

(66)

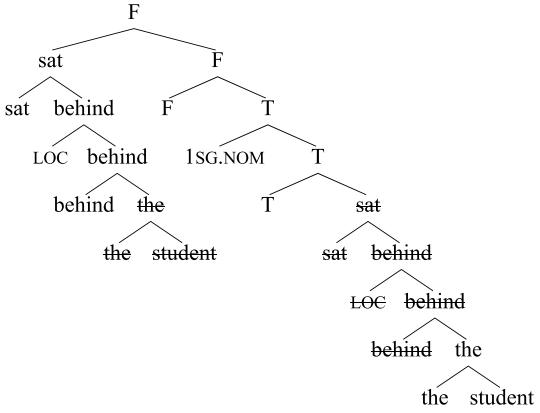


After scattered deletion, this structure can also be linearized because there is effectively no complex specifier. (66) is not an instance of (60).

Despite its apparent success, the account is ultimately too restrictive. It overly restricts the content of the fronted predicate. Convergence of the scattered deletion option is restricted in the following way: The derived specifier after deletion can only contain a single projection—the top one. That projection may contain a specifier or adjunct, but it cannot have a complement. That is, only the highest projection in the specifier can survive deletion in the higher copy. If the specifier were to be more articulated, a total linear order could once again not be achieved. To see this, consider the ungrammatical example in (67) in which only the complement of the preposition is extraposed. The corresponding structure after scattered deletion is (68).

(67) *Nipetraka tao aoriana aho ny mpianatra
PAST.sit LOC behind 1SG.NOM DET student
('I sat behind the student.')

(68)



As in (66), *sat* can be ordered with respect to the other terminals. *Behind*, however, cannot. It is asymmetrically c-commanded by *sat*, but it does not enter any c-command relations with 1SG.NOM, *the*, or *student*.[7] This restriction in the theory means that the verb must head the only projection in spec,FP. There cannot be a projection above the verb's projection or below it.

Both pre-verbal and post-verbal projections are possible however in Malagasy extraposition examples. Regarding pre-verbal elements, there is a large set of auxiliary-like particles that can precede the predicate (Rajaona 1972; Paul 2018). They include *saika* 'almost', *tsy* 'NEG', *tokony* 'should', *efa* 'already', *mahay* 'be able', *tena* 'really', and *tsy maintsy* 'must'. They are a heterogenous group, but it is very likely that some of them are heads in the clausal spine. For example, *azo* 'can' and *tokony* 'should' license VP ellipsis of their complements (Travis 2005; Paul 2018). This is a characteristic of independent heads (Lobeck 1995).[8] These auxiliary heads are not precluded from extraposition structures:

(69) a. **Tsy** hipetraka (ao aorian' ny mpianatra) aho (ao aorian' ny mpianatra)
NEG FUT.sit LOC behind DET student 1SG.NOM LOC behind DET student
'I will not sit behind the student.'

[7] One might wonder why a combination of scattered deletion and atomization of the predicate cannot save this derivation. Sheehan (2010:231) indicates that both atomization and scattered deletion are last resort operations. Either can apply in the course of a derivation but applying them both in a single derivation, as would be required to get (68) to converge, is avoided.

[8] An anonymous reviewer suggests that the verb could undergo head movement to the higher auxiliary head, forming a single complex head which would then be linearizable. I am not able to easily rule out this possibility; however, there is no evidence that I am aware of that the verb and the auxiliaries form a unit. The observation that some auxiliaries can be separated from the verb by ellipsis suggests that they do not.

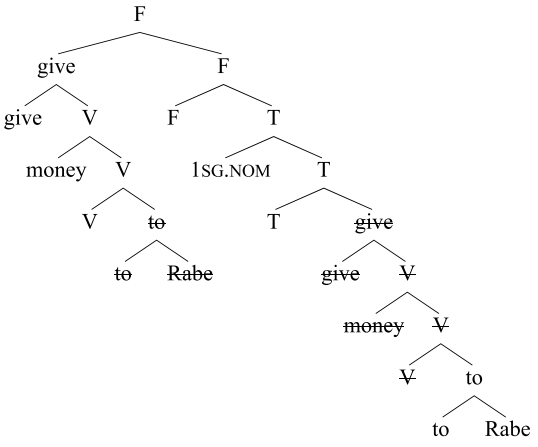
b. **Tena** tezitra (amin' ny mpiasa) aho (amin' ny mpiasa)
really angry PREP DET worker 1SG.NOM PREP DET worker
'Rabe is really angry with the worker.'

(70) **Efa** niteny izy fa tsy miova ny fitiavany
PFV PAST.say 3SG.NOM that NEG PRES.change DET love.3SG.GEN
'He said already that his love never changes.'

In addition to material being able to appear above the verb in extraposition examples, material may also appear below it. We have already seen numerous examples of a complement or an adjunct being left behind after extraposition, including (71). Because these phrases are inside the predicate and to the right of the verb, they are necessarily below the verb given the LCA and there is necessarily a second projection to house them. For example, if one adopts a VP shell analysis of ditransitives (Larson 1988; Bruening 2010), (71) has the structure in (72) after Chain Reduction in which there is a verbal projection below *nanome* 'give' which contains the direct object. Extraposition of a single complement in a ditransitive should be disallowed, contrary to fact.

(71) Nanome vola aho ho an-dRabe
PAST.give money 1SG.NOM PREP PREP-Rabe
'I gave money to Rabe.'

(72)



In summary, Sheehan's stranding analysis provides an interesting treatment of complement extraposition that can be applied to the basic cases, but it is ultimately overly restrictive when further data is considered. I conclude that it is not appropriate.[9]

[9] A reviewer asks whether a different scattered deletion analysis might yet work for Malagasy extraposition. I am not aware of an existing one; however, I cannot rule this out should future research lead to a different understanding of clause structure, movement, and scattered deletion.

Table 1 Three types of PF Movement

	OBEYS SYNTACTIC RESTRICTIONS	DERIVES SYNTACTIC STRUCTURE
SYNTACTIC PF MOVEMENT	yes	yes
MIXED PF MOVEMENT	no	yes
PHONOLOGICAL PF MOVEMENT	no	no

6 A PF Movement analysis

The conclusion that extraposition seems to have no syntactic consequences at Spell Out or LF suggests that extraposition is not derived in the narrow syntax at all. In this section, I propose that extraposition is PF movement that takes place in the derivation from Spell Out to PF (see the Y-model in (3)). Such an analysis can derive the word order changes and the lack of syntactic consequences because the branch from Spell Out to PF does not feed either Spell Out or LF. The proposal builds on earlier analyses that argue that extraposition is not syntactic (Rochemont 1978; Chomsky 1986; McCloskey 1999; Göbbel 2007, 2013). Section 6.1 presents an overview of PF movement as it is currently understood. Sections 6.2 through 6.4 present the proposed analysis. Section 6.5 addresses concerns of overgeneration.

6.1 PF movement

Our understanding of PF movement is much less developed than our understanding of overt and LF movement, as there are many fewer instances of PF movement in the literature compared with LF movement or overt movement. PF movement proposals in the literature approximately break down into three camps according to how they answer two questions: 1) Does the movement in question obey syntactic constraints and principles, and 2) does the movement create syntactic structure? Three resulting options are in Table 1. I call them Syntactic PF Movement, Mixed PF Movement, and Phonological PF Movement.

SYNTACTIC PF MOVEMENT is a syntactic operation on the branch from Spell out to PF. It is parallel to LF movement, which occurs on the branch from Spell Out to LF. It is an operation on syntactic structures that derives further syntactic structure. Syntactic PF Movement obeys various syntactic constraints and restrictions on movement. For example, it is subject to island constraints, locality, the Right Roof Constraint, and the Proper Binding Condition, which requires that moved elements bind their traces. If all movement is driven by feature checking (Chomsky 1995), then Syntactic PF Movement should also be feature driven. Examples of Syntactic PF Movement analyses in the literature include Weir's (2014) analysis of fragment answers, Sauerland and Elbourne's (2002) analysis of total reconstruction in English Subject-to-Subject Raising, Aoun and Benmamoun's (1998) fronting of clitic left dislocated elements in Lebanese Arabic, and Kidwai's (1999) analysis of Focus Movement in Hindi, Malayalam, Western Bade, and Tangale.

At the other end of the spectrum is PHONOLOGICAL PF MOVEMENT. This movement does not obey syntactic restrictions and also does not derive syntactic structure.

It manipulates phonological representations, such as prosodic structure, and derives phonological structures. It typically targets phonological/prosodic constituents. In contrast to Syntactic PF Movement, it is typically claimed to be free from syntactic restrictions but sensitive to a language's phonological well-formedness requirements. In the context of an optimality-theoretic approach to phonology, Phonological PF Movement is expected to derive an equally or more optimal phonological representation. Examples include Bennett et al.'s (2016) analysis of Irish Pronoun Postposing, Agbayani et al.'s (2015) analysis of Japanese prosodic scrambling, Agbayani and Golston's (2010, 2016) analysis of Classical Greek and Latin Hyperbaton, Manetta's (2012) analysis of post-verbal CPs in Hindi-Urdu, and Clemens and Coon's (2018) analysis of VOS in Ch'ol.

In between these two is what I call MIXED PF MOVEMENT. Like Syntactic PF Movement, Mixed Movement derives syntactic structure. Like Phonological PF Movement, however, it is not subject to syntactic constraints, and is driven by phonological/prosodic well-formedness. It too is typically formalized within an optimality-theoretic framework. Sabbagh's (2014) analysis of Tagalog word order has these characteristics, as does Göbbel's (2007, 2013) analysis of English extraposition from NP.[10]

Evidence from Sect. 4 indicates that Malagasy extraposition is not Syntactic PF Movement. It does not obey locality constraints on movement, such as the Right Roof Constraint. It also does not seem to be driven by any obvious feature checking or semantic consideration, as would be expected of Syntactic Movement. I make a brief digression to develop this point before returning to a Mixed PF Movement analysis.

6.2 The non-semantic nature of extraposition

Potsdam and Edmiston (2016), building on Pearson (2001), argues that optionally extraposed constituents are backgrounded/presupposed. This might suggest that the movement is semantically motivated and could be driven by a [background] feature. While this is true for examples they give, further data indicates that it is only a tendency, not an absolute requirement. For example, if EXPs are backgrounded, this leads to the expectation that *wh*-phrases should not extrapose, as they request new information. This does not seem to uniformly be the case. While (73a,b) are marked unacceptable in Potsdam and Edmiston (2016), they are accepted by some speakers. Further, (74) is uniformly accepted. I do not know what is behind the variation, but extraposed *wh*-phrases are possible.

(73) a. Nividy ilay boky (taiza) ianao (%taiza)?
PAST.buy DEM book where 2SG.NOM where
'Where did you buy that book?'

[10]These movements should be distinguished from genuine syntactic movement that is nonetheless phonologically motivated. Göbbel (2007) cites movement of contrastive topics in German to avoid a stress clash (Féry 2007) as an example. A second example is fronting of finite clauses in Malayalam (Aravind 2018). See also Zubizarreta's (1998) p(rosodically motivated)-movement, which is syntactic because it feeds LF. A final option is that PF movement does not exist; Bošković and Nunes (2007) suggest that PF movement should be eliminated from the grammar.

b. Nataon' i Jehovah (tamin' iza) ilay fifanekena (%tamin' iza)?
PAST.do.PASS Jehovah PREP who DEM covenant PREP who
'Jehovah made that covenant with who?' (Potsdam and Edmiston 2016:(12b))

(74) Nanao izany (oviana) ianao (oviana)?
PAST.do DEM when 2SG.NOM when
'When did you do that?'

Similarly, extraposed constituents are not completely impossible as an answer to a question, (75), although answers to questions are not backgrounded/presupposed. (75) shows that the answer to a question is preferably not extraposed, (75A1), but this is not absolute, (75A2).[11]

(75) Q: Oviana no lasa nody Rabe?
when FOC go.home Rabe
'When did Rabe go home?'
A1: Lasa nody omaly hariva izy
go.home yesterday evening 3SG.NOM
A2: ?Lasa nody izy omaly hariva
go.home 3SG.NOM yesterday evening
'Rabe went home last night.'

Finally, extraposed constituents may be contrastive, (76).

(76) Q: Nandeha tany an-tsena tamin' ny Alakamisy ianao?
PAST.go LOC PREP-market PREP DET Thursday 2SG.NOM
'Did you go to the market on Thursday?'
A: Tsia, tsy nandeha tany aho ny Alakamisy, fa nandeha tany
no NEG PAST.go LOC 1SG DET Thursday but PAST.go LOC
kosa aho tamin' ny Zoma
on.the.other.hand 1SG.NOM PREP DET Friday
'No, I didn't go there on Thursday, I went there on Friday.'

I conclude that Potsdam and Edmiston (2016) is incorrect in assigning a required backgrounding function to extraposition and, consequently, it cannot be used as syntactico-semantic trigger for movement, although backgrounding does seem to be involved in some unclear way. Hartmann (2017) similarly argues that German PP extraposition is only indirectly associated with information structure and that the right peripheral position is not linked to a specific interpretation. In a similar vein, Göbbel (2013) argues that extraposition from NP is not uniformly a focus construction, contrary to what has often been claimed (e.g. Rochemont and Culicover 1990; Huck and Na 1990).

[11] (75 A2) is marked as infelicitous (#) in Potsdam and Edmiston 2016:(13), but this seems too strong.

6.3 A prosodic analysis

Given that a Syntactic PF Movement analysis is not tenable, in what follows I offer a Mixed PF Movement analysis and the associated architecture in which it is embedded. Space considerations prevent developing a full analysis, which I hope to explore in future work. The core of the analysis is that, on the branch to PF, constituents within the predicate may be dislocated to the right edge of the clause. Restrictions on prosodic well-formedness yield the different patterns of obligatoriness/optionality.

I begin by developing a picture of Malagasy prosodic structure, couched in Match Theory (Selkirk 2011; Elfner 2012), a theory of how prosodic structure is built from syntactic representations. It assumes a hierarchy of prosodic constituents in (77) (Selkirk 1986; Inkelas 1990) and Match principles in (78).

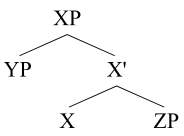
(77) Intonational Phrase (ι) > Phonological Phrase (φ) > Phonological Word (ω)

(78) a. Match Clause: an intonational phrase (ι) corresponds to a clause (highest node in the extended projection of TP)
b. Match Phrase: a phonological phrase (φ) corresponds to a syntactic phrase (maximal projection)
c. Match Word: a prosodic word (ω) corresponds to a head

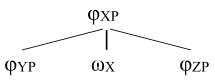
The relationship between syntactic and prosodic structure is rather direct, with phrasal and zero-level (heads) categories in the syntax mapping directly onto prosodic constituents in the phonological representation. Clauses correspond to intonational phrases and non-clausal phrases correspond to phonological phrases. Syntactic words (heads) correspond to prosodic words. Intermediate X' projections in the syntax do not correspond to any node in the prosodic structure, which is consequently flatter in comparison.

An X'-theoretic phrase as in (79a) will have the prosodic structure in (79b) according to the Match principles.

(79) a.



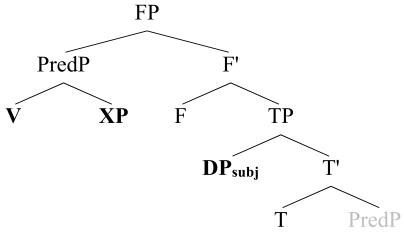
b.



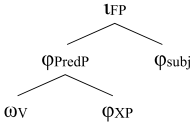
Given the Malagasy clause structure for VXS repeated in (80), the Match principles yield (81). The highest clausal node, FP, maps to an intonational phrase. Each non-clausal phrase maps to a phonological phrase and the verbal head maps to a prosodic word.[12]

[12] I assume that F° and T° are phonologically null. Consequently, they do not appear in the prosodic structure. Given this, the phonological phrase corresponding to TP (φ_{TP}) is not shown as it will expand directly to the subject phonological phrase (φ_{subj}).

(80) SPELL OUT OF VXS CLAUSE



(81) PROSODIC STRUCTURE OF VXS CLAUSE



Intonational studies of Malagasy declarative clauses (Dahl 1952; Rafitoson 1980; Raoniarisoa 1990; Frascarelli 2010; Aziz 2019; Barjam no date) support this basic picture, specifically, prosodic constituents corresponding to the predicate and subject. These works agree that the subject and predicate in a basic VOS clause each constitutes an "accentual group" (Rafitoson 1980) or "intonation-group" (Raoniarisoa 1990), which I will assume correspond to a phonological phrase, φ. There is not yet consensus on how these phrases are demarcated, however. Raoniarisoa (1990):207 and Frascarelli (2010) indicate that any non-final phonological phrase is marked by a rising high tone on its right edge, annotated as L*+H in Frascarelli (2010); whereas, Aziz (2019) and Barjam (no date) posit an L+H* pitch accent at the right edge of all phonological phrases, even the final one. There is general agreement that the final intonational phrase has a low (L%) boundary tone (Raoniarisoa 1990; Frascarelli 2010; Aziz 2019).

The grammatical architecture that I adopt for incorporating PF movement follows Göbbel (2013). The structure in (80) is the Spell Out representation. It is sent to PF which generates the corresponding prosodic structure in (81) using the Match principles. This pair of structures serves as the input to the GEN function of an optimality-theoretic system that generates a set of candidates. Each candidate is a pair consisting of a syntactic structure, which I will call a PF (SYNTACTIC) REPRESENTATION, following Göbbel, and a PROSODIC STRUCTURE.

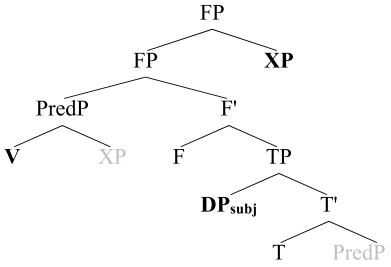
GEN can generate candidates in a number of ways but a relevant one is via PF Adjunction (Göbbel 2007:138), which adjoins a phrase to some other maximal projection.

(82) *PF Adjunction*
Adjoin XP to a phrasal projection

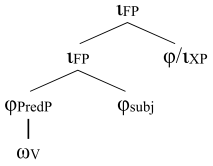
I will stipulate that GEN is limited to adjunction operations. From the syntactic structure/prosodic structure pair in (80, 81), an extraposition candidate can be derived, as shown in (83, 84). In the syntactic structure, the extraposed phrase, XP, is adjoined to the clausal node. In the corresponding prosodic structure, the Match principles will result in it prosodically adjoining in a corresponding location. Recent work strongly

suggests that recursion of prosodic constituents is allowed (Ladd 1986; Wagner 2010; Féry 2011; Elfner 2012, others).

(83) PF REPRESENTATION OF VSX CLAUSE



(84) PROSODIC STRUCTURE OF VSX CLAUSE



As with the VXS clause discussed above, this structure represents the observed prosody. In clauses with extraposition, the extraposed element forms its own "accentual group" or phonological phrase (Rafitoson 1980; Raoniarisoa 1990; Dahl 1996). In the VXS example in (85a), there are two phonological phrases: the predicate and the subject. In the VSX extraposition example in (85b), there are three phonological phrases: the verb, the subject, and the extraposed constituent.

(85) a. [Nifarana tamin' ny efatra]$_{\varphi}$ [ny fivoriana]$_{\varphi}$
PAST.end PREP DET four DET meeting

b. [Nifarana]$_{\varphi}$ [ny fivoriana]$_{\varphi}$ [tamin' ny efatra]$_{\varphi}$
PAST.end DET meeting PREP DET four
'The meeting ended at four o'clock.'

There is a cost in doing PF Adjunction, as the resulting candidate contains additional structure and is not identical to the input structure. I adopt the constraint NON-RECURSIVITY from Féry (2015:30) (see also Selkirk 1996 in (86)), which penalizes recursion in the prosodic structure. It will specifically be violated when additional prosodic structure is built via PF Adjunction.[13]

[13]Two reviewers question the use of Non-Recursivity as a holdout from earlier theories of prosodic structure in which recursion was not allowed at all (e.g. theories adopting Selkirk's 1981 Strict Layer Hypothesis) in contrast to more recent theories (e.g. Selkirk 2011) in which prosodic recursion is not penalized at all. I take the middle ground, along with Selkirk (1996); Féry (2011, 2015), and others, in allowing prosodic recursion but recognizing that it makes a prosodic representation less optimal. What is important for my purposes is that there is some penalty for doing PF Adjunction, which Non-Recursivity achieves. Other constraints that will yield this result are possible. For example, Göbbel (2013:407) penalizes the additional structure with a faithfulness constraint, FAITH$_S$, which requires that the input prosodic structure not be modified. Truckenbrodt (1999), Féry and Samek-Lodovici (2006), Féry (2007, 2011), and an anonymous reviewer propose constraints against the existence of prosodic categories, i.e. *φ and *ι. Such

(86) NON-RECURSIVITY: A prosodic constituent C_n does not dominate another constituent of the same level C_n.

The prosodic structures of both VXS, (81), and VSX, (84), do involve some recursion. In VXS, the recursion is at the level of the phonological phrase inside the predicate. In VSX, the recursion is at the level of the intonation phrase, at the root.

With this much in place, I proceed to show how the basic extraposition patterns, repeated in (87), can be accounted for. An outline of the proposal is that obligatory extraposition arises because the prosodic structure is more optimal with extraposition, impossible extraposition arises because the derived prosodic structure is less optimal, and optional extraposition arises in cases where both prosodic structures are equally optimal.

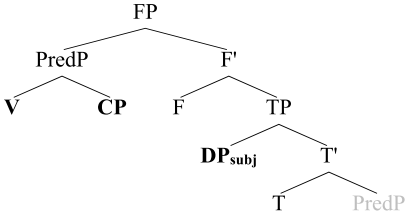
(87) Malagasy simple extraposition patterns
- a. impossible: nominal complements
- b. obligatory: clauses with overt subjects
- c. optional: PP complements, adverbials, clauses without overt subjects

Consider first the case of obligatory extraposition of CP complements:

(88) Manantena (*fa hividy fiara aho) Rabe (fa hividy fiara aho)
PRES.hope that FUT.buy car 1SG.NOM Rabe that FUT.buy car 1SG.NOM
'Rabe hopes that I will buy a car.'

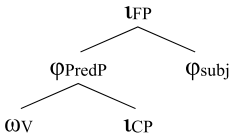
I argue that prosody drives the obligatory repositioning of a clausal complement. This proposal is not new and has been offered for obligatory CP extraposition in several languages, including German (Féry 2015), Malayalam (Aravind 2018), and Hindi (Manetta 2012). For Malagasy, it will be the case that the candidate PF representation and prosodic structures for the example with CP extraposition, shown in (91, 92), are more optimal than those in (89, 90), which lacks extraposition.

(89) PF REPRESENTATION OF VCPS CLAUSE

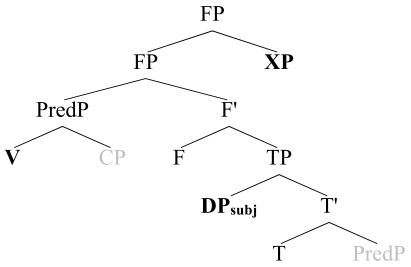


constraints would penalize recursive structure built with PF Adjunction. At this stage of the analysis, I am not able to decide between these options.

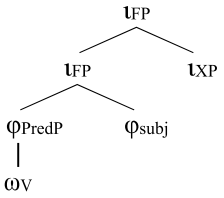
(90) PROSODIC STRUCTURE OF VCPS



(91) PF REPRESENTATION OF VSCP CLAUSE



(92) PROSODIC STRUCTURE OF VSCP



Indeed, (90) violates a constraint, LAYEREDNESS (Selkirk 1996; Féry 2015; Bennett et al. 2016), (93), which prohibits a prosodic constituent from containing a prosodic constituent that is higher that it on the prosodic hierarchy in (77). LAYEREDNESS allows an intonational phrase, ι, to contain a phonological phrase, φ, but it does not permit φ to contain ι, as in (90).

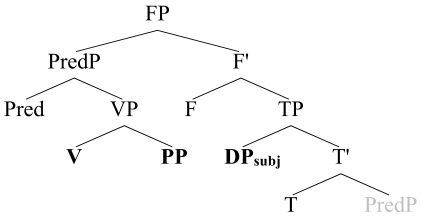
(93) LAYEREDNESS: A prosodic constituent may not contain a constituent that is higher on the prosodic hierarchy

Göbbel (2013) indicates that LAYEREDNESS is inviolable; however, as long as LAYEREDNESS is ranked higher than NON-RECURSIVITY, extraposition of the CP will be required. Extraposition wins out because it eliminates the Layeredness violation.

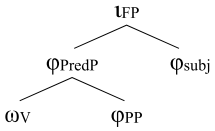
Now consider the optionality of PP extraposition shown in (94). The PF representation and prosodic structure of the option without extraposition are given in (95) and (96), respectively. The structures for the extraposition option are in (97) and (98).

(94) Tezitra (amin' ny mpiasa) Rabe (amin' ny mpiasa)
angry PREP DET worker Rabe PREP DET worker
'Rabe is angry with the workers.'

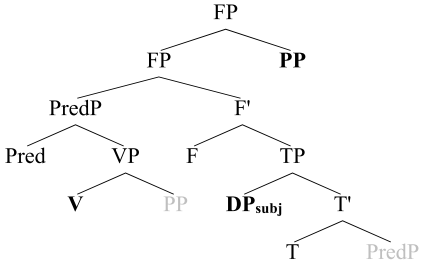
(95) PF REPRESENTATION OF VPPS CLAUSE



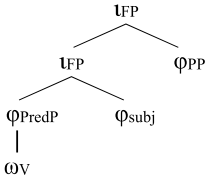
(96) PROSODIC STRUCTURE OF VPPS



(97) PF REPRESENTATION OF VSPP CLAUSE



(98) PROSODIC STRUCTURE OF VSPP



Both prosodic structures violate Non-Recursivity. In (96), the recursion is at the φ level, while in (98) it is at the ι level. Consequently, neither prosodic structure is better and both are allowed. This result obtains regardless of whether the PP is a complement or an adjunct, and regardless of its categorial status, as long as it is not a CP or a DP.

6.4 Ruling out DP extraposition

Finally, consider the case of impossible object extraposition, (99), which rules out VSO word order.

(99) Namono (ny akoho) Rasoa (*ny akoho)
PAST.kill DET chicken Rasoa DET chicken
'Rasoa killed the chicken.'

Objects do not behave the same as PP complements and it is not immediately clear why. One might hypothesize that object DPs do not extrapose because of complexity: DPs are less complex than PPs and insufficiently complex to extrapose. There is a great deal of work indicating that complexity of various kinds facilitates rightward placement (Hawkins 1994; Wasow 1997; Arnold et al. 2000, among others). This is concretely manifested in so-called Heavy NP Shift found in English (Ross 1967) and other languages. I argue that this is not the right way to look at the contrast and prosodic complexity is not in play. Various non-DP elements may extrapose and they may be prosodically quite light. (100a) illustrates a PP in which the prepositional object is expressed as a bound genitive case suffix. The PP *amiko* 'PREP-1SG.GEN' is a single prosodic word, as is the adverb in (100b).

(100) a. Tezitra (ami-ko) Rabe (ami-ko)
angry PREP-1SG.GEN Rabe PREP-1SG.GEN
'Rabe is angry with me.'

b. Tsy mandamina ny trano (matetika) Rakoto (matetika)
NEG PRES.arrange DET house often Rakoto often
'Rakoto generally does not put the house in order.'

Nor is syntactic complexity at stake. The DP object in (101) is more complex than the PP in (102) but still only the PP can extrapose.

(101) Namaky (ny boky momba ny alika) aho (*ny boky momba ny alika)
PAST.read DET book about DET dog 1SG.NOM DET book about DET dog
'I read the book about dogs.'

(102) Tezitra (amin' ny mpiasa) Rabe (amin' ny mpiasa)
angry PREP DET worker Rabe PREP DET worker
'Rabe is angry with the worker.'

I propose instead that the contrast is due to a categorial distinction between DP and PP. DPs do not extrapose, and this is the case regardless of their thematic role or morphological marking. (99) contains a theme DP, (103a) contains a cause DP, and (103b) contains a recipient DP in a double object construction. None can extrapose.

(103) a. N-amp-ianjera (ny latabatra) Rabe (*ny latabatra)
PAST-CAUS-fall DET table Rabe DET table
'Rabe caused the table to fall.'

b. Nanome voankazo (ny gidro) aho (*ny gidro)
PAST.give fruit DET lemur 1SG.NOM DET lemur
'I gave the lemur fruit.'

Féry (2015:22) suggests a syntactic explanation for the impossibility of DP extraposition in German in terms of Case, at least for a genitive DP extraposing from inside a larger DP. For reasons that are not made explicit, DPs cannot extrapose away from their Case assigner. DPs are unique in entering into an Agree (probe-goal) relationship with a case checker, which I will propose is the source of the restriction on DP

extraposition. I appeal to a constraint based on Richards's (2016) Contiguity Theory, as it invokes relevant aspects of the prosodic structure. The constraint is PROBE-GOAL CONTIGUITY (PGC). Definitions are given in (104) and (105). The core idea is that a probe and its goal must be structurally close within a minimal prosodic domain. This domain must contain the probe and the goal, and the goal must be at one edge or the other of the domain, determined on a language-particular basis. Given that GEN generates both PF representations and prosodic structures in the hypothesized Mixed PF Movement, PGC can be evaluated for the data under consideration.

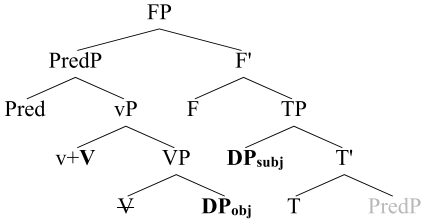
(104) *Probe-Goal Contiguity* (Richards 2016:142)
Given a Probe α and a Goal β, α and β must be dominated by a single φ, within which β is *Contiguity-prominent*.

(105) *Contiguity-prominence* (Richards 2016:142)
β is *Contiguity-prominent* within φ if β is adjacent to a prosodically active edge of φ

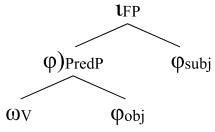
DP objects enter into an Agree (probe-goal) relation with v but non-DPs do not participate in such an Agree relation and will not be subject to Contiguity. As I show below, when a DP object is inside vP, it is Probe-Goal Contiguous with v. If the object extraposes over the subject however, Probe-Goal Contiguity is broken. If Probe-Goal Contiguity (PGC) as a constraint is sufficiently highly ranked, it will prohibit DP extraposition. It will not affect non-DPs.

In Malagasy, the prosodically active edge of a phonological phrase is the right edge, indicated by a right parenthesis on φ below. This is easily observed as phonological phrases are marked with a rising high tone on the right edge, as discussed above (Raoniarisoa 1990:207; Frascarelli 2010; Aziz 2019; Barjam no date). An object DP will satisfy PGC if it is on the right edge of a phonological phrase that dominates v and DP. The full structures for VOS are given in (106) and (107), where I have embedded vP within the fronted PredP, deriving VOS word order.

(106) PF REPRESENTATION OF VOS CLAUSE



(107) PROSODIC STRUCTURE OF VOS



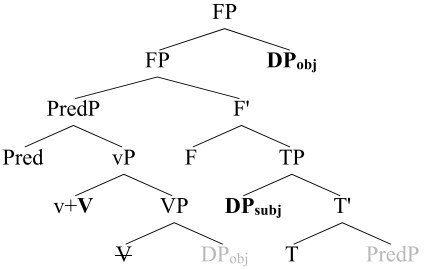
It might appear that the PGC will require adjacency between the v+V complex and the object but this is not the case. The object need only be at the right edge of a phonological phrase immediately dominating v+V. Thus, the proposal allows an object to

move away from the verb as long as it stays within vP. It can move rightward over an adverb, for example. This option is realized as a kind of rightward object shift in Malagasy (Pearson 1998):

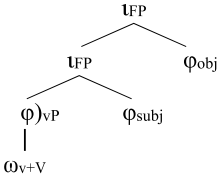
(108) Namono (ny akoho) an-tsirambina (ny akoho) Rasoa
PAST.kill DET chicken carelessly DET chicken Rasoa
'Rasoa killed the chicken carelessly.'

Nonetheless, PGC prevents an object from appearing further rightward, yielding VSO. Consider the PF representation and the prosodic structure generated by GEN for VSO, in (109) and (110). The object has undergone PF Adjunction to the right of the subject. In this position, it no longer satisfies PGC.

(109) PF REPRESENTATION OF VSO CLAUSE



(110) PROSODIC STRUCTURE OF VSO



If PGC is a potentially violable constraint, regardless of how it is ranked with respect to Non-Recursivity, object extraposition will be precluded.

Looking beyond extraposition and Malagasy, it appears that PGC is regularly violated, which might make the appeal to PGC to rule out object extraposition suspect. For example, in the English *wh*-question *What did Kim buy*? the *wh*-phrase object is clearly not contiguous with the v+V complex, despite being, or having been, in an Agree relation. Richards (2016) argues that PGC must be satisfied but that it is cyclic and need only be met within a phase. Once a phase is completed and undergoes Spell Out, contiguity relations can be forgotten. The cyclic nature of PGC might offer an understanding of why a violation of PGC now matters in the derivation to PF. There are no phases in the post-Spell Out derivation; there is a single cycle, in which PGC must hold.

6.5 Overgeneration

A reviewer raises the question of what restricts PF movement, specifically PF Adjunction, from overapplying, allowing, for example, PF preposing or clause-internal

PF movement. There are at least two concerns here. The first concern is the structural change created by PF Adjunction, its direction and landing site. The second concern is the overapplication of PF Adjunction, independent of the structural consequences. A general answer to both concerns, given the architecture adopted here, is other OT constraints, most of which I have not identified. PF Adjunction can apply freely; however, it may result in a prosodic structure that is worse than the structure without adjunction. An application of PF Adjunction would be precluded if it creates a less optimal prosodic structure. One can identify at least three families of constraints that will be relevant. There will be constraints which penalize additional structure beyond what is derived by applying the Match constraints to the Spell Out representation. That is, PF syntactic representations that are distinct from Spell Out will be dispreferred. See (111) for examples from the literature, as well as fn. 13. A constraint in this family is Agbayani and Golston's (2016) STAYX constraint, which incurs a violation if a phonological constituent of type X moves.

(111) Constraints on adding/changing prosodic structure

a. STAYX: A phonological constituent of type X does not move (Agbayani and Golston 2016)
b. NON-RECURSIVITY: A prosodic constituent C_n does not dominate another constituent of the same level C_n (Féry 2015)
c. NOPHRASE (= *i-phrase >> *p1-phrase, ... >> *pn-phrase)
d. NO SHIFT: linear precedence relations of terminal elements in the PF representation should match precedence relations in the prosodic representation (Bennett et al. 2016)

Second, there will be constraints on well-formed prosodic representations, examples of which are listed in (112). Selkirk (1996), for example, proposes a series of constraints that penalize prosodic structure that does not obey the Strict Layering Hypothesis. These included HEADEDNESS, EXHAUSTIVITY, LAYEREDNESS, and NON-RECURSIVITY. Constraints like BINARITY (Selkirk 1996) and EQUAL SISTERS (Myrberg 2013) penalize prosodic structures which are not binary branching, or which do not have prosodic sisters of the same type.

(112) Constraints on prosodic representations

a. HEADEDNESS: A prosodic constituent dominates a constituent of the immediately lower level (Selkirk 1996)
b. EXHAUSTIVITY: No constituent immediately dominates a constituent 2 levels lower on the prosodic hierarchy (Selkirk 1996)
c. LAYEREDNESS: A prosodic constituent does not contain a constituent that is higher on the prosodic hierarchy (Selkirk 1996)
d. NON-RECURSIVITY: A prosodic constituent C_n does not dominate another constituent of the same level C_n (Féry 2015)
e. EQUAL SISTERS: Sister nodes in prosodic structure should be of the same prosodic category (Myrberg 2013)
f. BINARITY: A prosodic constituent dominates at least/at most two constituents (Selkirk 1996, 2011)

g. STRONG START: A prosodic constituent optimally begins with a leftmost daughter constituent which is not lower in the prosodic hierarchy than the constituent that immediately follows (Selkirk 2011)

Finally, there are constraints that will influence the direction of Prosodic Adjunction, (113). These constraints generally interact with information structure to place prominent and non-prominent constituents in language-particular positions. Féry and Samek-Lodovici (2006) introduces DESTRESSGIVEN, which places given constituents in prosodically non-prominent positions. Such a constraint might be relevant to Malagasy extraposition, as extraposed constituents are often backgrounded, as discussed above.

(113) Directionality constraints
a. PROML/PROMR: Prominent material occurs to the left/right of its interface position (Agbayani and Golston 2010)
b. PROM: Maximally prominent material is initial in some phonological domain (Agbayani and Golston 2010)
c. DESTRESSGIVEN: A given constituent is prosodically non-prominent (Féry and Samek-Lodovici 2006)

While it is outside the scope of this paper to fully explore PF Adjunction, it is hoped that the general architecture makes it evident how the operation can be restricted.

To summarize, I have argued that extraposition in Malagasy is PF movement and have offered an initial analysis of the mixed pattern of optionality. Extraposition is required, allowed, or prohibited depending upon whether it creates a more optimal prosodic representation. That prosody determines the restrictions on extraposition is unsurprising if it is in fact due to PF movement.

7 Conclusion

Simple extraposition in Malagasy is responsible for a word order alternation between basic VOXS and VOSX. This paper has argued for two claims about the syntax of extraposed constituents in Malagasy:

(114) a. Extraposed constituents behave as though they are in their base position at LF
b. Extraposed constituents behave as though they are in their base position at Spell Out

In other words, extraposition seems to be both syntactically and semantically vacuous, despite the clear change in word order. Neither a canonical movement analysis nor a stranding approach was able to capture the full set of facts. I have argued that it can best be captured by analyzing extraposition as PF movement, an operation which takes place between Spell Out and PF. PF movement reorders constituents with no syntactic consequences at LF or Spell Out, in line with (114). I have implemented PF Movement in an OT framework in which extraposition results in an equally optimal

or more optimal prosodic structure. Further support for and development of the analysis requires investigation of Malagasy intonation, on which there is very little work. In addition, future work needs to investigate a wider range of phenomena to confirm that extraposition genuinely has no syntactic consequences.

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References

Agbayani, Brian, and Chris Golston. 2010. Phonological movement in Classical Greek. *Language* 8: 133–167.

Agbayani, Brian, and Chris Golston. 2016. Phonological constituents and their movement in Latin. *Phonology* 33: 1–42.

Agbayani, Brian, Chris Golston, and Toru Ishii. 2015. Syntactic and prosodic scrambling in Japanese. *Natural Language and Linguistic Theory* 3: 47–77.

Aoun, Joseph, and Elabbas Benmamoun. 1998. Minimality, reconstruction, and PF movement. *Linguistic Inquiry* 29: 569–597.

Aravind, Atulya. 2018. Licensing long-distance wh-in-situ in Malayalam. *Natural Language and Linguistic Theory* 36: 1–43.

Arnold, Jennifer E., Anthony Losongco, Thomas Wasow, and Ryan Ginstrom. 2000. Heaviness vs. newness: The effects of structural complexity and discourse status on constituent re-ordering. *Language* 76: 28–55.

Aziz, Jake. 2019. Malagasy intonation and constituents bearing pitch accents. Poster presentation at ICPhS 2019 Satellite Workshop. Abstract accessed May 29, 2019. https://linguistics.ucla.edu/people/jun/IntonationWorkshop2019/P3-Jake%20Aziz-Malagasy%20intonation-Abstract.pdf.

Baltin, Mark. 1978. *Towards a theory of movement rules*, PhD dissertation, MIT.

Baltin, Mark. 2017. Extraposition, In *The Wiley Blackwell companion to syntax*, 2nd edn. eds. Martin Everaert and Henk C. van Riemsdijk. New York: Wiley. Chap. 25.

Barbiers, Sjef. 1995. *The syntax of interpretation*, PhD dissertation, Leiden University.

Barjam, John Patrick. no date. The intonation of Malagasy declarative sentences. UCLA. Unpublished manuscript.

Bayer, Josef. 1997. CP extraposition as argument shift. *Linguistik Aktuell* 17: 37–58.

Bennett, Ryan, Emily Elfner, and James McCloskey. 2016. Lightest to the right: An apparently anomalous displacement in Irish. *Linguistic Inquiry* 47: 169–234.

Bobaljik, Jonathan David. 2002. A-chains at the PF-interface: Copies and 'covert' movement. *Natural Language and Linguistic Theory* 20: 197–267.

Bošković, Željko, and Jairo Nunes. 2007. The copy theory of movement: A view from PF. In *The copy theory of movement*, ed. Željko Bošković and Jairo Nunes, 13–74. Amsterdam: John Benjamins.

Bruening, Benjamin. 2010. Ditransitive asymmetries and a theory of idiom formation. *Linguistic Inquiry* 41: 519–562.

Büring, Daniel, and Katarina Hartmann. 1997. Doing the right thing—Extraposition as a movement rule. *The Linguistic Review* 14: 1–42.

Chomsky, Noam. 1981. *Lectures on government and binding*. Dordrecht: Foris.

Chomsky, Noam. 1986. *Barriers*. Cambridge: MIT Press.

Chomsky, Noam. 1995. *The minimalist program*. Cambridge: MIT Press.

Chung, Sandra. 2017. VOS languages: Some of their properties, 2nd edn. In *The Wiley Blackwell companion to syntax*, eds. Martin Everaert and Henk C. van Riemsdijk, 1–36. New York: Wiley.

Clemens, Lauren, and Jessica Coon. 2018. Deriving verb-initial word order in Mayan. *Language* 94: 237–280.
Cole, Peter, and Gabriella Hermon. 2008. VP raising in a VOS language. *Syntax* 11: 144–197.
Collins, Chris, and Paul Postal. 2014. *Classical neg raising*. Cambridge: MIT Press.
Crysmann, Berthold. 2013. On the locality of complement clause and relative clause extraposition. In *Rightward movement in a comparative perspective*, eds. Gert Webelhuth, Manfred Sailer, and Heike Walker, 369–398. Amsterdam: John Benjamins.
Culicover, Peter W., and Michael S. Rochemont. 1990. Extraposition and the complement principle. *Linguistic Inquiry* 21: 23–47.
Dahl, Otto Christian. 1952. Étude de phonologie et de phonétique malgaches. *Norsk Tidsskrift for Sprogvidenskap* 16: 148–200.
Dahl, Otto Christian. 1996. Predicate, subject, and topic in Malagasy. *Oceanic Linguistics* 35: 167–179.
de Swart, Henriëtte. 1998. Licensing of negative polarity items under inverse scope. *Lingua* 105: 175–200.
de Vries, Mark. 2002. *The syntax of relativization*. LOT: Utrecht.
de Vries, Mark. 2009. Specifying coordination: An investigation into the syntax of dislocation, extraposition and parenthesis. In *Language and linguistics: Emerging trends*, ed. Cynthia R. Dreyer, 37–98. New York: Nova.
Elfner, Emily. 2012. Syntax-prosody interactions in Irish, PhD dissertation, University of Massachusetts at Amherst.
Féry, Caroline. 2007. The prosody of topicalization. In *On information structure, meaning and form*, eds. Kerstin Schwabe and Susanne Winkler, 69–86. Amsterdam: John Benjamins.
Féry, Caroline. 2011. German sentence accents and embedded prosodic phrases. *Lingua* 121: 1906–1922.
Féry, Caroline. 2015. Extraposition and prosodic monsters in German. In *Explicit and implicit prosody in sentence processing*, eds. Lyn Frazier, and Edward Gibson, 11–38. Dordrecht: Springer.
Féry, Caroline, and Vieri Samek-Lodovici. 2006. Focus projection and prosodic prominence in nested foci. *Language* 82: 131–150.
Frascarelli, Mara. 2010. Intonation, information structure and the derivation of inverse VO languages. In *Austronesian and theoretical linguistics*, eds. Raphael Mercado, Eric Potsdam, and Lisa Travis, 81–102. Amsterdam: John Benjamins.
Giannakidou, Anastasia. 1998. *Polarity sensitivity as (non)veridical dependency*. Amsterdam: John Benjamins.
Göbbel, Edward. 2007. Extraposition as PF movement. In *Western Conference on Linguistics (WECOL) 34*, eds. Erin Bainbridge and Brian Agbayani, 132–145. Fresno: California State University.
Göbbel, Edward. 2013. Extraposition of defocused and light PPs in English. In *Rightward movement in a comparative perspective*, eds. Gert Webelhuth, Manfred Sailer, and Heike Walker, 399–439. Amsterdam: John Benjamins.
Guilfoyle, Eithne, Henrietta Hung, and Lisa Travis. 1992. Spec of IP and spec of VP: Two subjects in Austronesian languages. *Natural Language and Linguistic Theory* 10: 375–414.
Hartmann, Katharina. 2017. PP-extraposition and nominal pitch in German. *Wiener Linguistische Gazette* 82: 99–107.
Hawkins, John. 1994. *A performance theory of order and constituency*. Cambridge: Cambridge University Press.
Hoeksema, Jack. 2000. Negative polarity items: Triggering, scope and c-command. In *Negation and polarity: Semantic and syntactic perspectives*, eds. Laurence Horn and Yasuhiko Kato, 123–154. Oxford: Oxford University Press.
Hoekstra, Eric. 1991. Licensing conditions on phrase structure, PhD dissertation, University of Groningen.
Huang, C.-T. James. 1982. Logical relations in Chinese and the theory of grammar. PhD dissertation, MIT.
Huang, C.-T. James. 1993. Reconstruction and the structure of VP: Some theoretical consequences. *Linguistic Inquiry* 24: 103–138.
Huck, Geoffrey J., and Younghee Na. 1990. Extraposition and focus. *Language* 66: 51–77.
Inkelas, Sharon. 1990. *Prosodic constituency in the lexicon*. New York: Garland.
Kalin, Laura. 2009. News about the no-phrase: Specificational pseudoclefts in Malagasy, Undergraduate thesis, McGill University.
Kayne, Richard. 1994. *The antisymmetry of syntax*. Cambridge: MIT Press.
Keenan, Edward L. 1976. Remarkable subjects in Malagasy. In *Subject and topic*, ed. Charles Li, 247–301. New York: Academic Press.
Keenan, Edward L. 1995. Predicate-argument structure in Malagasy. In *Grammatical relations: Theoretical approaches to empirical questions*, eds. Clifford S. Burgess, Katarzyna Dziwirek, and Donna Gerdts, 171–216. Stanford: CSLI.

Kidwai, Ayesha. 1999. Word order and focus positions in Universal Grammar. In *The grammar of focus*, eds. Georges Rebuschi and Laurice Tuller, 213–244. Amsterdam: John Benjamins.
Klima, Edward S. 1964. Negation in English. In *The structure of language: Readings in the philosophy of language*, eds. Jerry A. Fodor and Jerrold J. Katz, 246–323. Englewood Cliffs: Prentice Hall.
Ladd, D. Robert. 1986. Intonational phrasing: The case for recursive prosodic structure. *Phonology* 3: 311–340.
Ladusaw, William A. 1979. Polarity sensitivity as inherent scope relations, PhD dissertation, University of Texas at Austin.
Laka, Itziar. 1994. *On the syntax of negation*. New York: Garland.
Larson, Richard. 1988. On the double object construction. *Linguistic Inquiry* 19: 335–391.
Lasnik, Howard. 1972. Analyses of negation in English, PhD dissertation, MIT.
Law, Paul. 1995. On grammatical relations in Malagasy control structures. In *Grammatical relations: Theoretical approaches to empirical questions*, eds. Clifford S. Burgess, Katarzyna Dziwirek, and Donna Gerdts, 271–290. Stanford: CSLI.
Law, Paul. 2007. The syntactic structure of the cleft construction in Malagasy. *Natural Language and Linguistic Theory* 25: 765–823.
Linebarger, Marcia. 1980. The grammar of negative polarity, PhD dissertation, MIT.
Linebarger, Marcia. 1987. Negative polarity and grammatical representation. *Linguistics and Philosophy* 10: 325–387.
Lobeck, Anne. 1995. *Ellipsis, functional heads, licensing, and identification*. New York: Oxford University Press.
Mahajan, Anoop. 1990a. The A/A-bar distinction and movement theory, PhD dissertation, MIT.
Mahajan, Anoop. 1990b. LF conditions on negative polarity licensing. *Lingua* 80: 333–348.
Mahajan, Anoop. 1997. Rightward scrambling. In *Rightward movement*, eds. Dorothee Beerman, David LeBlanc, and Henk van Riemsdijk, 186–214. Amsterdam: John Benjamins.
Manetta, Emily. 2012. Reconsidering rightward scrambling: Postverbal constituents in Hindi-Urdu. *Linguistic Inquiry* 43: 43–74.
Massam, Diane. 2000. VSO and VOS: Aspects of Niuean word order. In *The syntax of verb initial languages*, eds. Andrew Carnie and Eithne Guilfoyle, 97–116. Oxford: Oxford University Press.
McCloskey, James. 1996. On the scope of verb movement in Irish. *Natural Language and Linguistic Theory* 14: 47–104.
McCloskey, James. 1999. On the right edge in Irish. *Syntax* 2: 189–209.
Merchant, Jason. 2000. Antecedent-contained deletion in negative polarity items. *Syntax* 3: 144–150.
Müller, Gereon. 1995. On extraposition and successive cyclicity. In *On extraction and extraposition in German*, eds. Uli Lutz and Jürgen Pafel, 213–243. Amsterdam: John Benjamins.
Myrberg, Sara. 2013. Sisterhood in prosodic branching. *Phonology* 30: 73–124.
Overfelt, Jason. 2015. Rightward movement: A study in locality, PhD dissertation, University of Massachusetts at Amherst.
Paul, Ileana. 2000. Malagasy clause structure, PhD dissertation, McGill University.
Paul, Ileana. 2001a. Concealed pseudoclefts. *Lingua* 111: 707–727.
Paul, Ileana. 2001b. *Ve* as a second-position clitic. *Oceanic Linguistics* 40: 135–142.
Paul, Ileana. 2005. Or, *wh*-, and not: Free choice and polarity in Malagasy. In *UCLA Working Papers in Linguistics 12: Proceedings of AFLA XII*, ed. Jeffrey Heinz and Dimitris Ntelitheos, 359–367. Los Angeles: UCLA Linguistics Department.
Paul, Ileana. 2018. The syntax of Malagasy auxiliaries: Initial observations. *Proceedings of AFLA 24: Journal of the Southeast Asian Linguistics Society.*
Pearson, Matthew. 1998. Rightward object shift and the syntax of adverbs. In *UCLA occasional papers in linguistics 20: The structure of Malagasy II*, ed. Ileana Paul, 34–49. Los Angeles: UCLA Department of Linguistics.
Pearson, Matthew. 2001. The clause structure of Malagasy: A minimalist approach, PhD dissertation, UCLA.
Pearson, Matthew. 2005. The Malagasy subject/topic as an A' element. *Natural Language and Linguistic Theory* 23: 381–457.
Pearson, Matthew. 2017. Predicate raising and perception verb complements in Malagasy. *Natural Language and Linguistic Theory* 36: 1–69.
Polinsky, Maria, and Eric Potsdam. 2005. Malagasy control and its theoretical implications. In *Berkeley Linguistics Society (BLS) 30*, eds. Marc Ettlinger, Nicholas Fleisher, and Mischa Park-Doob, 365–376. Berkeley: Berkeley Linguistics Society.

Potsdam, Eric. 2007. Malagasy sluicing and its consequences for the identity requirement on ellipsis. *Natural Language and Linguistic Theory* 25: 577–613.
Potsdam, Eric, and Daniel Edmiston. 2016. Extraposition in Malagasy. In *Austronesian Formal Linguistics Association (AFLA) 22*, ed. Henrison Hsieh, 121–138. Canberra: Asia-Pacific Linguistics.
Potsdam, Eric, and Maria Polinsky. 2007. Missing complement clause subjects in Malagasy. *Oceanic Linguistics* 46: 277–303.
Rafitoson, Elisa. 1980. Accent et Intonation de la phrase objective en malgache-merina. Thèse de Doctorat de 3e cycle, Aix-en-Provence.
Rahajarizafy, Antoine de Padoue. 1960. *Essai sur la grammaire Malgache*. Antananarivo: Imprimerie Catholique.
Rajaona, Siméon. 1972. *Structure du Malgache. Etudes des formes prédicatives*. Fianarantsoa: Librairie Ambozontany.
Rajemisa-Raolison, Régis. 1969. *Grammaire Malgache*. Fianarantsoa: Librairie Ambozontany.
Randriamasimanana, Charles. 1986. *The causatives of Malagasy. Oceanic Linguistics special publications 21*. Honolulu: University of Hawaii Press.
Raoniarisoa, Noro. 1990. Accent and intonation in a Malagasy dialect, PhD dissertation, University of Wales.
Richards, Norvin. 2016. *Contiguity theory*. Cambridge: MIT Press.
Rochemont, Michael S. 1978. A theory of stylistic rules in English, PhD dissertation, University of Massachusetts, Amherst.
Rochemont, Michael S., and Peter Culicover. 1990. *English focus constructions and a theory of grammar*. Cambridge: Cambridge University Press.
Ross, John Robert. 1967. Constraints on variables in syntax, PhD dissertation, MIT.
Sabbagh, Joseph. 2014. Word order and prosodic-structure constraints in Tagalog. *Syntax* 17: 40–89.
Sabel, Joachim. 2002. *Wh*-questions and extraction asymmetries in Malagasy. *MIT Working Papers in Linguistics* 44: 309–323.
Sabel, Joachim. 2007. Adjunct extraction in Malagasy. Handout, ZAS/Berlin Beyond Focus and Ergativity: Towards a More Comprehensive View of Austronesian Morphosyntax Conference. September 14, 2007.
Sauerland, Uli, and Paul Elbourne. 2002. Total reconstruction, PF movement, and derivational order. *Linguistic Inquiry* 33: 283–319.
Selkirk, Elisabeth. 1986. On derived domains in sentence phonology. *Phonology Yearbook* 3: 371–405.
Selkirk, Elisabeth. 1996. The prosodic structure of function words. In *Signal to syntax: Bootstrapping from speech to grammar in early acquisition*, eds. James L. Morgan and Katherine Demuth, 187–213. Mahwah: Lawrence Erlbaum Associates.
Selkirk, Elisabeth. 2011. The syntax-phonology interface. In *The handbook of phonological theory*, eds. John Goldsmith, Jason Riggle, and Alan Yu. Oxford: Blackwell. Chap. 14.
Sheehan, Michelle. 2010. Extraposition and antisymmetry. In *Linguistic variation yearbook 10*, ed. Jeroen von Craenenbroeck, 201–251. Amsterdam: John Benjamins.
Sheehan, Michelle. 2013. Some implications of the copy theory of labeling. *Syntax* 16: 362–396.
Travis, Lisa. 2005. VP-internal structure in a VOS language. In *Verb first: On the syntax of verb-initial languages*, eds. Andrew Carnie, Heidi Harley, and Sheila Ann Dooley, 203–234. Amsterdam: John Benjamins.
Truckenbrodt, Hubert. 1999. On the relation between syntactic phrases and phonological phrases. *Linguistic Inquiry* 30: 219–255.
Uriagereka, Juan. 1999. Multiple spell-out. In *Working minimalism*, eds. Samuel David Epstein and Norbert Hornstein, 251–282. Cambridge: The MIT Press.
Uribe-Etxevarria, Maria. 1994. Interface licensing conditions on negative polarity items: A theory of polarity and tense interactions, PhD Dissertation, University of Connecticut.
Wagner, Michael. 2010. Prosody and recursion in coordinate structures and beyond. *Natural Language and Linguistic Theory* 28: 183–237.
Wasow, Thomas. 1997. Remarks on grammatical weight. *Language Variation and Change* 9: 81–105.
Weir, Andrew. 2014. Fragments and clausal ellipsis, PhD dissertation, University of Massachusetts at Amherst.
Wilder, Chris. 1996. Rightward movement as leftward deletion. In *On extraction and extraposition in German*, eds. Uli Lutz and Jürgen Pafel, 273–309. Amsterdam: John Benjamins.
Zribi-Hertz, Anne, and Liliane Mbolatianavalona. 1999. Towards a modular theory of linguistic deficiency: Evidence from Malagasy pronouns. *Natural Language and Linguistic Theory* 17: 161–218.
Zubizarreta, Maria Luisa. 1998. *Prosody, focus, and word order*. Cambridge: MIT Press.
Zwart, Jan-Wouter. 1994. Dutch is head initial. *The Linguistic Review* 11: 377–406.