

How to sluice in the wh-in-situ language Malagasy

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1 Introduction

Sluicing is the construction illustrated in (1a) in which an interrogative clause is reduced to only a wh-phrase. Sluicing is typically analyzed as wh-movement followed by TP deletion, as shown in (1b) (Ross 1969, Merchant 2001).

- (1) a. Somebody left and I know who
b. Somebody left and I know [_{CP} who_i [_C C°[wh] [_{TP} ~~t_i left~~]]]

If wh-movement is a prerequisite for sluicing, the prediction is that wh-in-situ languages should not have sluicing. For one wh-in-situ language, Malagasy (Western Austronesian, Madagascar), this prediction is apparently incorrect:

- (2) nandoko zavatra i Bao fa manadino aho hoe inona
paint thing Bao but forget I COMP what
'Bao painted something but I forget what'

The goal of this paper is to explore how Malagasy can have sluicing without wh-movement. The paper is organized as follows: Section 2 presents some basic facts about Malagasy word order. Section 3 turns to question formation in Malagasy and provides evidence that Malagasy is in fact a wh-in-situ language. This observation is not uncontroversial because Malagasy appears to have wh-movement. We provide evidence that such apparent fronting is in fact a base-generated pseudocleft structure, not wh-movement. Section 4 presents the Malagasy sluicing construction along with two possible analyses. We reject an account in which Malagasy sluicing involves exceptional wh-movement. In section 5 we provide evidence for our own analysis, that Malagasy sluicing is derived via wh-predicate fronting followed by TP deletion. Predicate fronting has been proposed by other researchers as a general mechanism to derive the predicate-initial (VOS) word order of some Austronesian languages so our analysis dovetails well with recent theoretical proposals. Section 6 contains conclusions, typological considerations, and further issues.

2 Basic Malagasy word order

Malagasy is well-known for having fairly rigid VOS word order, (3). More generally, the predicate can be any phrasal category, in addition to VP, so that the

language can be described as predicate initial, (4).^{1 2}

- (3) mividy ny akoho i Bao
 buy the chicken Bao
 ‘Bao is buying the chicken’
- (4) a. [vorona ratsy feo]_{NP} ny goaika
 bird bad voice the crow
 ‘The crow is a bird with an ugly voice’
 b. [faly amin’ ny zanany]_{AP} Rasoa
 proud PREP the child.3SG Rasoa
 ‘Rasoa is proud of her children’
 c. [any an-tsenan]_{PP} Rakoto
 PREP ACC-market Rakoto
 ‘Rakoto is at the market’

One exception to this relatively fixed word order is that complement CPs are extraposed to a clause-final position yielding VSO order, (5a). Immediately post-verbal position for the CP is impossible, (5b).

- (5) a. nilaza Rabe [fa mividy ny akoho i Bao]
 say Rabe that buy the chicken Bao
 ‘Rabe said that Bao is buying the chicken.’
 b. *nilaza [fa mividy ny akoho i Bao] Rabe
 say that buy the chicken Bao Rabe

3 Questions in Malagasy

3.1 Two types of wh-questions

Malagasy has two strategies for forming information questions. When questioning non-subjects, wh-in-situ is possible (see Sabel 2003 for discussion), (6).

¹ We use the following abbreviations in glossing: 1/2/3-person, ACC-accusative, ASP-aspect, COMP-complementizer, LOC-locative, NEG-negative, NOM-nominative, PASS-passive voice, PREP-preposition, PRT-particle, SG/PL-number.

² There is considerable debate in literature over the nature of the clause-final DP, whether it is a subject or an Abar topic-like element. We continue to refer to it as a subject for convenience, without taking a stand on the issue. See Pearson, to appear for discussion.

- (6) a. nividy inona i Be? OBJECT
 buy what Be
 ‘What did Be buy?’
 b. nividy ny vary taiza i Be? ADJUNCT
 buy the rice where Be
 ‘Where did Be buy the rice?’
 c. *nividy ny vary iza? *SUBJECT
 buy the rice who
 (‘Who bought the rice?’)

There is no evidence of wh-movement in such examples. Tests for covert movement show that the wh-phrase does not seem to move even at LF: wh-in-situ is not sensitive to islands, (7), and does not trigger weak crossover, (8).

- (7) namangy ny lehilahy izay nanasa inona i Be?
 meet the man REL wash what Be
 (lit. “Be met the man who washed what?”)
 ‘What did Be meet the man who washed?’

- (8) manaja an’iza ny reniny?
 respect who.ACC the mother.3SG
 ‘Who_i does his_j mother respect?’

The second question strategy is that, for non-complements (subjects and adjuncts), the wh-phrase appears at the beginning of the clause followed by the particle *no* (see Keenan 1976, MacLaughlin 1995, Paul 2001, Sabel 2003, for further description), (9).

- (9) a. *inona no nividy i Be? *OBJECT
 what PRT buy Be
 (‘What did Be buy?’)
 b. taiza no nividy ny vary i Be? ADJUNCT
 where PRT buy the rice Be
 ‘Where did Be buy the rice?’
 c. iza no nividy ny vary? SUBJECT
 buy PRT buy the rice
 ‘Who bought the rice?’

While such examples might appear to involve wh-movement with a question complementizer *no*, we will show in the following subsection that they are actually pseudoclefts (Dahl 1986, Paul 2001, and Potsdam 2004). As schematized in (10), the initial wh-phrase is the predicate of the clause, also called the focus or pivot. The remaining material is a headless relative in subject position. The wh-

(10) [predicate iza][subject/headless relative no Op_i nihomehy t_i]
 who PRT laugh
 (lit. ‘The one who laughed is who?’)
 ‘Who laughed?’

(11) a. [_{predicate} wh-phrase] [_{subject} no Op_i ... t_i] ✓PSEUDOCLEFT ANALYSIS
 b. [_{CP} wh-phrase_i [_{C'} no [_{TP} ... t_i]] ✗FRONTING ANALYSIS

[illegible]

There are a number of parallels between the focus construction and wh-questions. First, both are formed by preposing a constituent and following it immediately with the particle *no*. Second, the two constructions have a similar focus interpretation of the initial XP. Wh-phrases indicate a request for new information in the same way that focused XPs supply new information. The focus construction is most naturally translated into English with a cleft or pseudocleft. Third, the two constructions are subject to an identical fronting restriction that we already saw

above for wh-questions: only subjects and adjuncts can be fronted (Keenan 1976 and others). The same restriction holds of the focus construction, (13).

- (13) a. *ny vary no nividy Rabe *OBJECT
 the rice PRT buy Rabe
 ('It's the rice that Rabe bought')
- b. omaly no nividy ny vary Rabe ADJUNCT
 yesterday PRT buy the rice Rabe
 'It's yesterday that Rabe bought the rice'
- c. Rabe no nividy ny vary SUBJECT
 Rabe PRT buy the rice
 'It's Rabe who bought the rice'

Analyzing wh-questions as clefts immediately accounts for these parallels. They are unexplained or at least accidental under the fronting analysis since the focus constructions and wh-questions would have very different structures.

The pseudocleft analysis is also supported by observations that the initial wh-phrase behaves like a predicate. There are a number of verbal elements that flank the predicate in Malagasy. For example, the floating quantifiers *daholo* 'all' and *avy* 'each', and the VP-adverb *foana* 'always' immediately follow the predicate in VOS clauses:

- (14) a. namaky ny boky **daholo** ny ankizy
 read the book all the child
 'All the children read the book'
- b. any an-tsena **foana** Rakoto.
 there ACC-market always Rakoto
 'Rakoto is always at the market'

These elements likewise immediately follow a wh-phrase in questions:

- (15) a. iza **daholo** no namaky ny boky?
 who all PRT read the book
 'Who all read the book?'
- b. iza **foana** no any an-tsena?
 who always PRT there ACC-market
 'Who is always at the market?'

Other post-predicate particles that behave the same way include the exclamative element *anie* and the parenthetical *hono* 'so they say'.

Similarly, the modal elements *toa* 'seem' and *tokony* 'should', and the emphatic element *tena* 'indeed' immediately precede the predicate in VOS clauses:

- (16) a. **tokony** hamangy an-dRakoto Raso
 should visit ACC-Rakoto Raso
 'Raso should visit Rakoto'
 b. **tena** nanapaka bozaka Rabe
 indeed cut grass Rabe
 'Rabe indeed cut the grass'

Such elements also immediately precede a wh-phrase:

- (17) a. **tokony** iza no hamangy an-dRakoto?
 should who PRT visit ACC-Rakoto
 'Who should visit Rakoto?'
 b. **tena** iza no nanapaka bozaka?
 indeed who PRT cut grass
 'Who indeed cut the grass?'

Potsdam 2004 explores such data in more detail but even at this level of presentation the data make sense if wh-questions are pseudoclefts in which the initial wh-phrase is a predicate, not a fronted element. Under the fronting analysis, the placement of the various elements is unexpected because the wh-phrase is not a predicate but is very high in the clause structure. Such elements would have to have special distribution statements for wh-questions, different from ordinary clauses.

We conclude that Malagasy has no wh-movement. Wh-questions use either an in-situ or pseudocleft strategy. This sets up a paradox because, as we show in the next section, Malagasy has sluicing, a construction which depends upon wh-movement.

4 Malagasy sluicing

Before introducing the Malagasy sluicing examples, recall the English example, repeated from (1):

- (18) a. Somebody left and I know who
 b. Somebody left and I know [_{CP} who_i [_C C°[wh] [_{TP} ~~t_i left~~]]]

In such examples, we will call the missing material the SLICED CLAUSE and indicate it with strikethrough. The REMNANT is the wh-phrase that remains (*who* above) and the CORRELATE is the XP corresponding to the wh-phrase (*somebody* above) in the ANTECEDENT CLAUSE.

Two examples of Malagasy sluicing are given in (19).

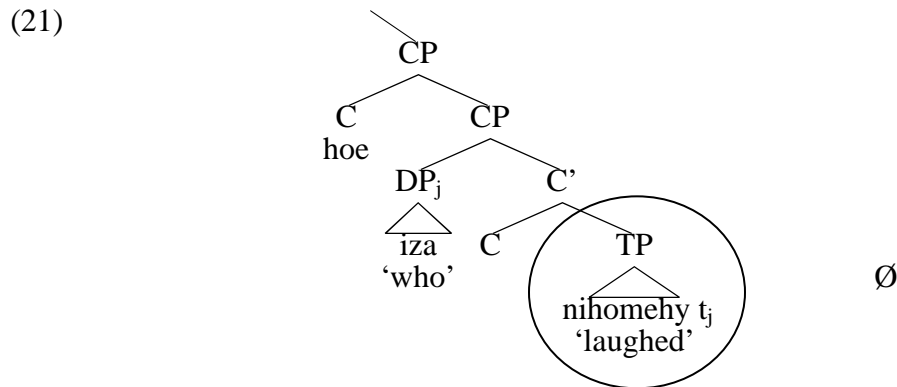
- (19) a. nandoko zavatra i Bao fa manadino aho hoe inona
 paint thing Bao but forget I COMP what
 ‘Bao painted something but I forget what’
 b. nisy olona nihomehy ka nanontany ianao hoe iza³
 exist person laugh and ask you COMP who
 ‘Someone laughed and you asked who’

If such examples truly instantiate sluicing, they are surprising because sluicing as analyzed by Ross 1969, Merchant 2001, and others requires wh-movement prior to the deletion of the remainder of the clause (TP). In what follows, we propose two solutions to this puzzle. The first, in section 4.1, suggests that there actually is wh-movement, despite our earlier conclusions. We reject this analysis and propose instead, in section 4.2, that the input configuration for TP deletion is derived not by wh-movement but by a general predicate fronting operation that exists independently to derive VOS word order. This analysis is compatible with our conclusions about the structure of wh-questions above.

4.1 Deletion repair

One solution to the Malagasy sluicing paradox is to acknowledge, despite appearances, that the sluicing examples do involve the necessary wh-movement. The derivation of (20) would be as in (21), parallel to the English case.

- (20) nisy olona nihomehy ka nanontany ianao hoe
 exist person laugh and ask you COMP
 [CP iza_i [_{TP} ~~nihomehy t_i~~]].
 who laugh
 ‘Someone laughed and you asked who’



³ The antecedent clause in this example takes the form of an existential construction because indefinite subjects are impossible in Malagasy (Keenan 1976).

We will call this the Deletion Repair analysis: Malagasy has wh-movement just in case deletion eliminates the TP containing the trace of wh-movement. We might assume that Malagasy does not show wh-movement because it would violate some general movement restriction in the language. The deletion somehow ameliorates the violation. The analysis is based on the observation that sluicing apparently rescues other violations of constraints on movement, notably island constraints (Ross 1969) (data from Chung, Ladusaw, and McCloskey 1995 and Merchant 2001):

- (22) a. *complex noun phrase constraint*
 They want to hire someone who speaks a Balkan language, but I don't remember which ~~they want to hire someone who speaks~~.
- b. *wh-island*
 Sandy was trying to work out which students would be able to solve a certain problem, but she wouldn't tell us which one ~~she was trying to work out which students would be able to solve~~.
- c. *COMP-trace effect*
 It has been determined that someone will be appointed, but I can't remember who ~~it has been determined that will be appointed~~.

Lasnik 2001 and Kennedy and Merchant 2000 propose specific analyses of this genre in which an illicit movement is rendered licit by PF deletion.

Despite the appeal of the analysis, there are four problems. First, if wh-movement is to the specifier of CP, as is usually the case, it is unexpected that the wh-phrase follows rather than precedes the embedded question complementizer *hoe*:

- (23)
- | | | | | |
|----|-----------|---------|-------|--------|
| | nandoko | zavatra | i Bao | fa ... |
| | paint | thing | Bao | but |
| a. | manadino | aho | hoe | inona |
| | forget | I | COMP | what |
| b. | *manadino | aho | inona | (hoe) |
| | forget | I | what | COMP |
- 'Bao painted something but I forget what'

Second, the Deletion Repair analysis predicts that accusative case wh-phrase remnants should be grammatical because wh-movement should be able to target any wh-phrase. This is incorrect, (24).

- (24) *nanasa olona Rabe ka nanontany aho hoe an'iza
 invite person Rabe and.so asked I COMP who.ACC
 ('Rabe invited someone and I asked whom')

Third, the analysis predicts that if there were a configuration in which sluicing could not ameliorate the movement constraint violation, such examples would be

ungrammatical. An example is sluicing with implicit correlates (Chung, Ladusaw, and McCloskey 1995, Romero 1998, Merchant 2001, and others). English sluicing with implicit correlates is illustrated in (25). There is no overt correlate in the antecedent clause to which the *wh*-remnant corresponds. The correlate is implicit.

- (25) a. She's reading. I can't imagine what.
 b. They're baking a cake, but they wouldn't say for whom.

Implicit correlates are relevant because sluicing with implicit correlates cannot violate constraints on movement. Sluicing is unable to rescue such derivations (contrast these with the grammatical examples in (22)).

- (26) a. *complex noun phrase constraint*
 *Kim knows the person who was reading but she won't say what (she knows the person who was reading)
 b. *wh-island*
 *Agnes wondered when John would bake a cake but it's not clear for whom (Agnes wondered when John would bake a cake)

The Deletion Repair analysis predicts that Malagasy sluices with implicit correlates should likewise be ungrammatical; however, this is incorrect:

- (27) namaky i Rasoa fa tsy fantatro hoe inona
 read Rasoa but NEG know.1SG COMP what
 'Rasoa was reading but I don't know what'

Finally, it remains mysterious why there would be *wh*-movement just in this instance. There does not seem to be any language-internal motivation. We conclude that sluicing in Malagasy does not involve otherwise unavailable *wh*-movement. The question remains how the *wh*-predicate in a sluice can get outside of TP to allow for deletion. We offer an another answer in the next subsection.

4.2 Predicate fronting

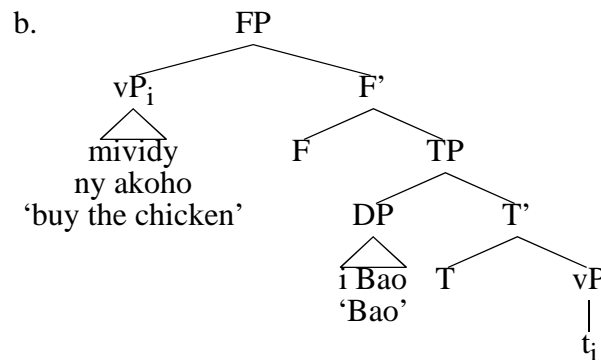
Our proposal is that sluicing makes use of mechanisms independently available in the grammar. First, sluicing involves embedded questions which are pseudoclefts, just as root questions are pseudoclefts. (28) illustrates an embedded question. They take the form of a matrix *wh*-question introduced by the complementizer *hoe*.⁴

⁴ In this paper, we do not fully address the licensing conditions for sluicing (see Merchant 2001). We suggest here that it is the question complementizer *hoe* that licenses the deletion.

- (28) nanontany ianao hoe iza *(no) nihomehy
 ask you COMP who PRT laugh
 ‘You asked who laughed’

Second, the wh-predicate of the pseudocleft moves out of TP via predicate fronting. Recently, there have been a number of proposals in the literature that VOS word order in Austronesian languages is derived from an underlying SVO order via predicate fronting (Massam and Smallwood 1997, Rackowski and Travis 2000, Massam 2000, Pearson 2001, Aldridge 2002, Travis 2004; see Chung, to appear for discussion). The derivation of a basic VOS is clause is as in (29) in which an underlying SVO structure is transformed into VOS by fronting the predicate phrase, vP, to the specifier of a projection FP above TP.

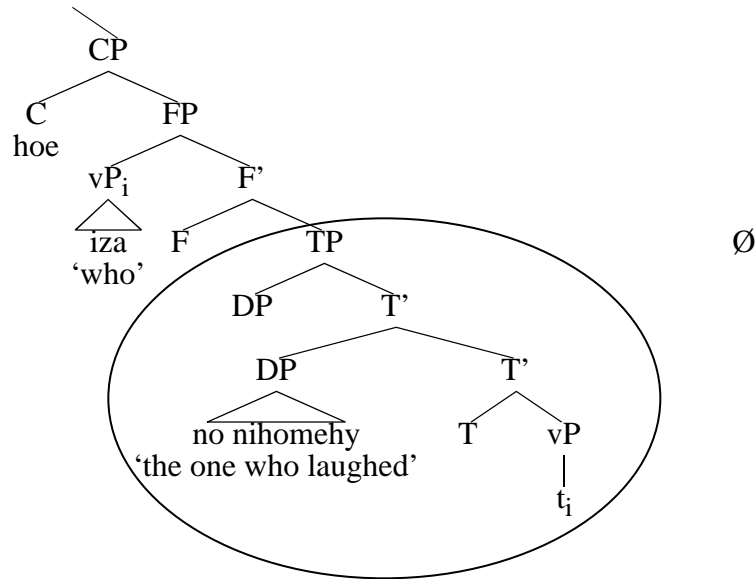
- (29) a. mividy ny akoho i Bao
 buy the chicken Bao
 ‘Bao is buying the chicken’



The simplest assumption is that such predicate fronting also occurs in (embedded) wh-questions and as part of the derivation of sluicing examples, (30).

- (30) a. nisy olona nihomehy ka
 exist person laugh and
 nanontany ianao hoe iza ~~no~~ — ~~nihomehy~~
 ask you COMP who PRT laugh
 ‘Someone laughed and you asked who (laughed)’

b.



If predicate fronting is independently part of Malagasy grammar, then it provides the necessary movement to feed TP deletion. In the next section we provide some evidence that the above derivation is on the right track.

5 Evidence for the Predicate Fronting Analysis

Our evidence in favor of predicate fronting plus TP deletion as the source of Malagasy sluicing consists in showing that the wh-phrase remnant in sluicing is actually a predicate, as is expected under the proposed derivation.

First, the same elements that can flank predicates in matrix clauses (see section 3.2) also co-occur with wh-phrase remnants in sluicing. Pre-predicate elements such as the modal *tokony* ‘should’ and the emphatic element *tena* ‘indeed’ can precede a sluiced wh-phrase, (31), and post-predicate elements such as the floating quantifier *daholo* ‘all’ and the VP adverb *foana* ‘always’ can follow the wh-remnant, (32).

- (31) a. misy olona tokony hamangy an-dRaso fa
 exist person should visit ACC-Raso but
 tsy fantatro hoe [_{pred} **tokony** iza]
 NEG know.1SG COMP should who
 ‘Someone should visit Raso but I don’t know who should’
 b. nisy olona nanapaka bozaka fa
 exist person cut grass but
 tsy tadidiko hoe **tena** iza
 NEG remember.1SG COMP indeed who
 ‘Someone cut the grass but I don’t remember who indeed did’

- (32) a. nahandro zavatra maro Raso fa
 cook thing several Raso but
 tsy fantatro hoe inona **daholo**
 NEG know.1SG COMP what all
 ‘Raso cooked several things but I don’t know what all’
- b. any an-tsena matetika ny mpivarotra sasany fa
 there ACC-market often the seller some but
 tsy fantatro hoe iza **foana**
 NEG know.1SG COMP who always
 ‘Some sellers are often at the market but I don’t know who always is’

Second, all and only the *wh*-phrases that can be predicates can be sluicing remnants.⁵ We have already seen that accusative *wh*-phrases cannot be sluicing remnants, (33). They also can not be questioned in a pseudocleft, (34), because only subjects and some adjuncts can be questioned with this strategy as discussed in section 3.1.

- (33) *nanasa olona Rabe ka nanontany aho hoe an’iza
 invite someone Rabe and ask I COMP who.ACC
 (‘Rabe invited someone and I asked whom’)
- (34) *an’iza no nanasa Rabe?
 who.ACC PRT invite Rabe
 (‘Whom did Raso invite?’)

In the same vein, prepositional phrases can be pseudoclefted and sluiced:

⁵ The one exception that we know of to this claim is *wh-the-hell* phrases, which are ungrammatical in sluices (as in English) but acceptable as predicates.

- (i) *nanasa olona Raso fa tsy fantatro hoe mpamosavy iza
 invite person Raso but NEG know.1SG COMP witch who
 *‘Raso invited someone but I don’t know who the hell’
- (ii) mpamosavy iza no nasain-dRaso?
 witch who PRT invite.PASS-Raso
 ‘Who the hell did Raso invite?’

We follow den Dikken and Giannakidou 2002 and attribute the ungrammaticality of (i) to the impossibility of linking the *wh-the-hell* phrase to a discourse familiar entity (*olona* ‘someone’).

- (35) tamin' inona no namonoan-dRaso ny akoho?⁶
 with what PRT kill.PASS-Raso the chicken
 'What did Raso kill the chicken with?'
- (36) namono ny akoho tamin-javatra maranitra Raso fa
 kill the chicken with thing sharp Raso but
 tsy fantatro hoe tamin' inona
 NEG know.1SG COMP with what
 'Raso killed the chicken with something sharp but I don't know with what'

In summary, wh-phrase remnants in sluicing are predicates. This observation supports our claim that sluicing examples are derived by predicate fronting and subsequent TP deletion. The derivation is similar to that assumed for English except that the wh-phrase is fronted by predicate fronting, not wh-movement.

6 Conclusion

In this paper we have provided an analysis of sluicing in the wh-in-situ language Malagasy. Our analysis of Malagasy sluicing contributes to the typology of ways in which wh-in-situ languages create a sluicing-like surface structure. We review several strategies here. In Malagasy, we have argued, sluicing is wh-predicate fronting followed by TP deletion:

- (37) nisy olona nihomehy ka
 exist person laugh and
 nanontany ianao hoe [_{FP} [_{VP} iza]_i ~~t_{TP} — no nihomehy t_i~~]
 ask you COMP who PRTlaugh
 'Someone laughed and you asked who (the one who laughed was)'

Japanese derives sluicing examples using a reduced cleft (Merchant 1998 and references therein):

- (38) dareka-ga sono hon-o yon-da ga
 someone-NOM that book-ACC read-PAST but
 watashi-wa [_{CP} [_{TP} *pro*_{expl} dare ~~da/de aru~~] ka] wakaranai
 I-TOP who be-PRES Q know.NEG
 'Someone read the book but I don't know who (it is).'

Chinese creates sluicing-like examples via a copula construction with a null anaphoric pronoun. The structure does not involve any deletion (Adams 2002):

⁶ The verb in this example is in what is called the circumstantial voice. It is roughly equivalent to the passive of an applicative.

- (39) Xiaomei mai le yi-jian liwu_i, danshi
 Xiaomei buy ASP one-CLASSIFIER present but
 ta bu gaosu wo [_{TP} *pro*_i shi sheme]
 she not tell 1SG is what
 ‘Xiaomei bought a present, but she didn’t tell me what (that was)’

Finally, Javanese has a strategy in which there is focus movement of a wh-phrase to a clause-initial position followed by TP deletion (Adams 2003):

- (40) umpamane Tika lunga
 if Tika go
 ibune kudu ngerti [_{FocP} [neng ngendi]_i [_{TP} ~~dheweke lunga t_i~~]]
 mother must know LOC where 3SG go
 ‘If Tika goes somewhere, her mother must know where (she goes)’

A consequence of our analysis is that Malagasy is not a counterexample to movement analyses of sluicing. On the contrary, we have provided another kind of movement, predicate fronting, which can feed the deletion operation. Our proposal and the above languages highlight the fact that sluicing is not a construction *per se*. A sentence that superficially looks like English sluicing need not have an English-like derivation. Different languages arrive at the same surface form via different syntactic means. We hypothesize that which strategy (or strategies) a language uses depends upon the syntactic mechanisms independently available in the language.

One consequence of our analysis is that it provides evidence for predicate fronting in Malagasy. While there is much recent work espousing predicate fronting as the mechanism by which verb-initial word order in Austronesian languages is derived, there is thus far little empirical evidence for this fronting operation (see Chung, to appear for important discussion) and it is usually adopted based on theory-internal consideration. Our analysis thus has potentially important consequences for theories of Austronesian clause structure.

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