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**Edited by**

**Matt Pearson**

  
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Cover photo of the AFLA 24 conference icon.

# JSEALS

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## INTRODUCTION FROM THE VOLUME EDITOR

The Austronesian Formal Linguistics Association (AFLA) is an informal organization of linguists which promotes the study of Austronesian languages from a formal perspective, including both experimental and fieldwork-based methodologies. AFLA serves as a forum for the presentation of new research focusing on the phonetic, phonological, morphological, syntactic, semantic, typological, and psycholinguistic analysis of individual Austronesian languages, as well as work which compares the structure of Austronesian languages with each other and with languages outside the family. The first AFLA conference took place in 1994 at the University of Toronto, and was co-organized by Anna Maclachlan, Diane Massam, Richard McGinn, Barry Miller, and Lisa Travis. Annual meetings of AFLA have been held every year since 1994. More information about AFLA, including a list of prior conference programs and proceedings, can be found at [www.uwo.ca/linguistics/research/afla/index.html](http://www.uwo.ca/linguistics/research/afla/index.html).

The papers in this special publication of JSEALS were originally presented at the 24th annual meeting of AFLA, which was held at the University of Washington in Seattle on April 7-9, 2017. The conference was co-organized by faculty and students at the University of Washington Department of Linguistics and the Department of Linguistics at Reed College (Portland, Oregon), and included both a general session and a workshop on Comparative Formosan Linguistics. On behalf of the AFLA 24 organizing committee, I would like to thank the authors of these papers for their contributions, as well as the conference participants and volunteers, and the following organizations for their financial support: the Chiang Ching-kuo Foundation for International Scholarly Exchange, the University of Washington College of Arts and Sciences, and the University of Washington Department of Asian Languages and Literature, as well as the University of Washington's East Asia Center, Southeast Asia Center, and Taiwan Studies Initiative.

### **Editor**

Matt Pearson  
Reed College  
co-chair, AFLA 24 Organizing Committee  
chair, AFLA 24 Program Committee

## **FROM THE JSEALS EDITOR-IN-CHIEF**

This is the fourth JSEALS special publication. The goal of JSEALS special publications is to share collections of linguistics articles, such as select papers from conferences or other special research agendas, as well as to offer a way for linguistic researchers in the greater Southeast Asian region to publish monograph-length works.

This volume contains six papers from the AFLA 24 conference. The languages covered in this volume are spoken in Taiwan, Indonesia, Oceania and Madagascar. This vast extension on “Greater Southeast Asia” is the case because, though Austronesian has an insular Southeast Asian presence and origins, it has famously extended quite far through Austronesian seafaring skill, making it necessary to include languages in this tremendous geographic range. Five of the papers are on issues of semantico-syntactic issues, with one on phonology, making this a substantive contribution to theoretical linguistics in general.

We are very pleased that JSEALS is able to contribute to the sharing of quality linguistic research in both mainland and insular Southeast Asia.

**Mark J. Alves**

December 1<sup>st</sup>, 2019

Montgomery College

Rockville, Maryland

# FORMOSAN SPEECH ACT MOOD IN COMPARATIVE SYNTAX<sup>1</sup>

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## Abstract

The study explores speech act moods, especially the declarative mood, in two Formosan languages—Tsou and C’uli’ Atayal—under a cartographic approach (Rizzi 1997, 2004; Cinque 1999). We discover that (i) in Tsou, the particle *’a* encodes emphatic affirmative mood and is incompatible with non-affirmatives (interrogatives, imperatives, exclamatives, and sentential negation), thereby heading a Speech Act Phrase (SAP) on the top of the whole sentence; (ii) in C’uli’, the particle *ay* represents assurance mood and is incompatible with non-declaratives; *ay* heads a SAP, topping the whole sentence; (iii) *’a* and *ay* respect the Main Clause Phenomenon (MCP, Haegeman 2010) in declaratives; (iv) *’a* surfaces sentence-initially, and *ay* sentence-finally. These findings imply that (i) SAP should be separated from and placed above  $F_{\text{orce}}P$ ; (ii) SAP is intended for speech act mood and exhibits the MCP, whereas  $F_{\text{orce}}P$  is intended for clause typing (contra Rizzi 1997, 2004) and does not exhibit the MCP.

**Keywords:** Tsou, C’uli’, speech act mood, declarative, affirmative, assurance, negation, MCP  
**ISO 639-3 codes:** tsu

## 1 Introduction

Speech act mood is concerned with the mood that encodes the speaker’s communicative intention in the grammar. Grammatically, speech act mood can be classified into two major categories, namely, declaratives versus non-declaratives (including interrogatives, imperatives, and expressives/exclamatives). This paper is focused on declarative mood in two Formosan languages, viz., Tsou and C’uli’ Atayal. While having received increasing attention in the generative literature (Rizzi 1997, Cinque 1999, Speas & Tenny 2003, Haegeman & Hills 2013, among many others), speech act mood is rarely studied in Formosan languages. This paper aims to fill the gap.

In the traditional generative view, speech act mood is considered as peripheral to the grammar and very much ignored accordingly (Chomsky 1981, 1995). However, recent studies have demonstrated that like other grammatical categories, speech act mood is subject to universal grammatical constraints and that it may be also part of the Universal Grammar (UG). Based on a large-scale investigation of adverbials across the world’s languages, Cinque (1999) proposes that adverbials encoding speech act mood such as the English adverb *frankly* should be merged in a dedicated projection in the left periphery, as schematized as in (1).

(1) The universal hierarchy of clausal functional projections (Cinque 1999:106)

$\left[ \textit{frankly} \text{Mood}_{\text{speech act}} \right] \textit{fortunately} \text{Mood}_{\text{evaluative}} \left[ \textit{allegedly} \text{Mood}_{\text{evidential}} \right]$   
 $\left[ \textit{probably} \text{Mod}_{\text{epistemic}} \right] \left[ \textit{once} \text{T(Past)} \right] \left[ \textit{then} \text{T(Future)} \right] \left[ \textit{perhaps} \text{Mood}_{\text{irrealis}} \right]$

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<sup>1</sup> This paper grew out of a keynote speech given at the annual meeting of the 24<sup>th</sup> Austronesian Formal Linguistics Association (AFLA 24), University of Washington, Seattle, 7-9 April 2017. I am grateful to the audience there, in particular, Edith Aldridge, Michael Erlewine, Eric Potsdam, and Martina Wiltschko, for their valuable comments. I am also thankful to my Tsou consultants (Mo’e Yakumangana, Sayu’e Yulunana, and Yangu’e Yasiungu) and C’uli’ consultants (Kumu Kagi and Sayta Pihaw). I am also indebted to two anonymous reviewers for their useful suggestions. I thank my research assistants Lushan Huang and Maochang Ku for their assistance of various kinds. This study is financially supported by the Taiwan Ministry of Science and Technology (MOST) and the institute of Linguistics, Academia Sinica.

Furthermore, Haegeman (2010) observes that speech act mood adverbs like *frankly* exhibit the Main Clause Phenomenon (MCP): that is, they are restricted to the main clause and not allowed in subordinate clauses. Consider (2).

(2) The Main Clause Phenomenon (Haegeman 2010)

a. *Frankly*, when he is unable to come, we will have to replace him.

b. \*When *frankly* he is unable to come, we will have to replace him.

It will be demonstrated in this paper that speech act mood in Tsou and C'uli' Atayal also conforms to the universal grammatical constraints proposed by Cinque and Haegeman, hence in line with the view that includes speech act mood in UG.

It is usually held that declarative mood is formally unmarked, as opposed to non-declarative moods (Sadock & Zwicky 1985, König & Siemund 2007). Nonetheless, it should be pointed out that a declarative mood is actually also characterized by certain special formal markers in many languages. In English, for example, the above-mentioned speech act mood adverb *frankly* is characteristic of declarative sentences. As shown in (3), *frankly* can pattern with a declarative mood but not with non-declaratives.

- (3) a. Frankly, I don't like Donald Trump. (declarative)  
 b. \*Frankly, what do you want? (interrogative)  
 c. \*Frankly, go away! (imperative)  
 d. \*Frankly, what a shame! (exclamative)

It is shown in this paper that a declarative mood entertains some special markings in Tsou and C'uli' Atayal as well.

This paper is organized as follows. Section 2 gives a detailed description of the affirmative mood marker 'a in Tsou. Section 3 offers a syntactic account for the affirmative mood marker 'a and explores its interactions with negation and evidentiality in the language. Section 4 presents the function, distribution, and syntactic behavior of the final particle *ay* in C'uli' Atayal and gives a cartographic account. Section 5 concludes the paper by discussing its typological and theoretical implications.

## 2 Affirmative mood in Tsou

### 2.1 The functions and distribution of the particle 'a

In Tsou, a declarative sentence may start with the particle 'a in a number of situations. First, the particle 'a appears when a speaker responds to the addressee's query in a rather positive mood. As in (4)<sup>2</sup>, the particle 'a precedes the entire sentence in a positive answer to the query 'Anyone there?', with the intonation falling rather than rising in the end of the sentence. This contrasts with a negative answer, where the sentence starts with the existential negator *uk'a*.

<sup>2</sup> Abbreviations in examples represent the following: ABS absolutive, AFF affirmative, ASR assuring, AV agent voice, CAUS causative, COMP complementizer, CONJ conjunction, COS change of state, CP complementizer phrase, DEM determiner, DT downtoner, ERG ergative, EXIS existential, GEN genitive, HAB habitual aspect, IMP imperative, INTF intensifier, INTR intransitive, IRR irrealis, LA locative applicative, Lnk linker, NA non-affirmative, NEG negative, Nom nominative, OBL oblique, Part particle, Past past tense, Perf perfective, PF perfect marker, PLN place name, PN personal name, POSS possessive, Q question, REL relativizer, RL realis, S singular, TOP topic, TR transitive.



## (4) Tsou

Q: *pano mo yonta emoo?* (rising intonation)  
 there.is.OBL RL.INTR be.at.OBL house  
 ‘Anybody there?’

A1: *'a panto mo yonta emoo.* (falling intonation)  
 ? there.is.OBL RL.INTR be.at.OBL house  
 ‘Surely, there is somebody in the house.’

A2: *uk'a ci mo yonta emoo.*  
 there.is.no OBL RL.INTR be.at.OBL house

Likewise, as in (5), the particle *'a* is applied when the speaker answers the addressee’s question ‘Do you speak Tsou?’ and reassures the addressee of his speaking capacity.

## (5) Tsou

Q: *lea-ko meelx bua cou?*  
 HAB-2S.ABS be.able.to speak Tsou  
 ‘Do you speak Tsou?’

A: *'a lea-'u.* (affirmative reply, emphasis on the truth)  
 ? HAB-1S.ABS  
 ‘Yes, I do.’

Second, the particle *'a* may be used when the speaker expresses his strong confidence in the truth of the information he provides. As in (6), the particle *'a* conveys an affirmative message, as opposed to the sentential negator *o'a*.

## (6) Tsou

Q: *zou a'mtx yoskx eni?* (rising intonation)  
 is real fish this.ABS  
 ‘Is this real fish?’

A1: *zou, 'a a'mtx yoskx eni.* (falling intonation)  
 yes ? real fish this.ABS  
 ‘Yes, this is undoubtedly real fish.’

A2: *o'a.*  
 NEG  
 ‘No. (This is not a real fish).’

Third, a speaker may employ the particle *'a* to express his determination on a certain business. In (7), the speaker intends the particle *'a* for his determined job assignment.

## (7) Tsou

*suu, 'a te-ko uh-ne maibayu.*  
 2.S ? IRR-2S get.to-OBL Chiayi  
 ‘As for you, undoubtedly, you should go to Chiayi.’

In brief, the particle *'a* may indicate the speaker’s communicative intention of giving a positive answer, reassuring the addressee, and stressing his determination. Grammatically, the particle *'a* occurs sentence-

initially, preceding the auxiliary that encodes the temporal mood of the sentence. The constructions led by the particle 'a stand in opposition to those led by the sentential negators *o'a* or *uk'a*.

## 2.2 'a as an affirmative mood marker

Based on the above observations, we propose to analyze the particle 'a as an affirmative declarative mood marker which heads a speech act phrase (SAP) and tops the whole sentence. The affirmative mood head analysis receives support from distributional, positional, as well as morphological evidence. Let us consider the distributional evidence first.

### 2.2.1 The distributional evidence

The particle 'a is restricted to affirmative declarative sentences. As in (8)-(9), it is incompatible with interrogatives, either yes-no questions or wh-questions.

#### (8) Yes-no question in Tsou

<u>(*'a )</u>	<i>te-ko</i>	<i>uh-ne</i>	<i>maibayu</i>	<i>hohucma?</i>
AFF	IRR-1S.ABS	get.to-OBL	Chiayi	tomorrow
'Will you go to Chiayi tomorrow?'				

#### (9) Wh-question in Tsou

<u>(*'a )</u>	<i>te-ko</i>	<i>uh-nenu?</i>
AFF	IRR-2S.ABS	get.to-where
'Where are you going?'		

Neither does it pattern with imperatives, as in (10).

#### (10) Imperatives in Tsou

a. <u>(*'a )</u>	<i>'ote</i>	<i>la</i>	<i>'aoko</i>	<i>m-imo</i>	<i>to</i>	<i>emi!</i>
AFF	NEG.IMP	HAB	continently	INTR-drink	OBL	alcohol
'Don't drink alcohol all the time!'						
b. <u>(*'a )</u>	<i>te-ko=n'a</i>	<i>yc 'x!</i>				
AFF	IRR-2S.ABS=DT	rise.INTR				
'Please rise!'						

Nor does it co-occur with exclamatives, as in (11).

#### (11) Exclamatives in Tsou

a. <u>(*'a )</u>	<i>mainci</i>	<i>na'no</i>	<i>nongonongo!</i>			
AFF	why	very	silly			
'How come you are so silly!'						
b. <u>(*'a )</u>	<i>ci</i>	<i>mo</i>	<i>na'no</i>	<i>pepe</i>	<i>'o</i>	<i>huphina-si!</i>
AFF	why	RL.INTR	very	high	ABS	price-3S.POSS
'How expensive it is!'						

It is evident that the particle 'a is characteristic of declarative sentences. In the meantime, the particle 'a exhibits the MCP on a par with the English *frankly*, as in (12) and (13).

## (12) Subordinates in Tsou

a. *ho* (*\*'a*) *ta-ko* *toyovcu,* *ta-'u* *pa-hafo*  
 when AFF IRR-2S.ABS go.downwards IRR-1S.ABS CAUS-bring  
*to macucuma.*  
 OBL something  
 ‘When you go to Chiayi, I’ll ask you to bring something along.’

b. *hoci-ko* (*\*'a*) *toyovcu,* *ta-'u* *pa-hafo*  
 if-2S.ABS AFF go.downwards IRR-1S.ABS CAUS-bring  
*to macucuma.*  
 OBL something  
 ‘If you go to Chiayi, I’ll ask you to bring something along.’

## (13) Complement clause in Tsou

*'a* *os-'o* *cohiv-i* *ho* (*\*'a*) *mi-ta* *avzovzo* *no* *peisu.*  
 AFF RL.TR-1S.ERG know-LA COMP AFF RL.INTR-1S.ABS be.lack.INTR OBL money  
 ‘I do know that he is short of money.’

This suggests that the particle *'a* represents a speech act mood, just like *frankly*.

In addition to its contrast with sentential negators in the discourse, as discussed above, the particle *'a* is not compatible with them in distribution either. Compare (14) and (15).

## (14) Tsou

(*\*'a*) *o'a* *te-'o* *uh-ne* *maibayx* *hohucma.*  
 AFF NEG IRR-1S.ABS get.to-OBL Chiayi tomorrow  
 ‘I will not go to Chiayi tomorrow.’

## (15) Tsou

(*\*'a*) *uk'a* *ci* *peisu-'u*  
 AFF there.is.no OBL money-1S.POSS  
 ‘I have no money.’

It becomes clear that the particle *'a* occurs as an affirmative mood marker.

## 2.2.2 The positional and morphological evidence

The speech act mood status of the particle *'a* is also evidenced by the fact that it is required to precede the rest of the elements in the sentence, and hence is structurally situated above the whole sentence. In (16), it is shown that the particle *'a* is merged above the temporal mood phrase (MoodP).

## (16) Tsou

a. *'a* *mo-'u* *uh-ne* *maibayx* *nehucma.*  
 AFF RL.INTR-1S.ABS get.to-OBL Chiayi yesterday  
 ‘I did go to Chiayi yesterday.’

b. *'a* *te-'o* *uh-ne* *maibayx* *hohucma.*  
 AFF IRR-1S.ABS get.to-OBL Chiayi tomorrow  
 ‘Surely, I will go to Chiayi tomorrow.’

The example in (17) indicates that the particle *'a* is merged above the topic phrase (TopP).

(17) Tsou

<i>'a</i>	<i>'e</i>	<i>yasiungu</i>	<i>moso</i>	<i>la</i>	<i>asonghoi yone</i>	<i>ca'hamu ci</i>	<i>cou.</i>
AFF	TOP	PN	RL.INTR	HAB	start.out stay	PLN	REL people

'As for the Yasiungu family, they started out from Tainan.'

Furthermore, the fact that the particle *'a* can attract clitics, as in (18), aligns it with functional heads like the auxiliary in the language, as in (19).

(18) Tsou

<i>'a=c'o</i>	<i>'e</i>	<i>tfuya</i>	<i>'o</i>	<i>mo</i>	<i>yaa</i>	<i>yavaiana.</i>
AFF=only	DEM	PLN	ABS	RL	have	PN

'Indeed, only the Tfuya village has the Yavaiana family.'

(19) Tsou

<i>mi-'o=c'o</i>	<i>boepuyu</i>	<i>ho</i>	<i>mi-'o</i>	<i>yxmexmx</i>	<i>ta</i>	<i>aemana.</i>
RL.INTR-1S.ABS=only	backward	CONJ	RL.INTR-1S.ABS	enter	OBL	inside

'I only did backward walking and entered the room.'

### 2.3 Summary

In brief, the particle *'a* surfaces as the head of an affirmative speech act mood and projects a speech act phrase (SAP) on the top of the whole sentence. Accordingly, the CP left periphery of a sentence in connection with the particle *'a* in Tsou can be schematized as in (20).

(20) Tsou CP left periphery (first approximation)

[<sub>SAP</sub> *'a* [<sub>TopP</sub> *'e* [<sub>MoodP</sub> *te ...* ]]]

In the next section, we demonstrate how the affirmative mood marker *'a* interacts syntactically with negators and evidentials.

## 3 Interactions with negators and evidentials

### 3.1 Sentential negation vs. lexical negation

In Tsou, there are six negators, namely, *o'a*, *'ote*, *teav'a*, *uk'a*, *o'te*, and *'oha*. The negator *o'a* is a sentential negator, occurring sentence-initially. The negators *'ote* and *teav'a* introduce imperative sentences; they are in complementary distribution—the former used in intransitives and the latter in transitives. The negator *uk'a* typically introduces an existential sentence, followed by a special oblique case marker *ci*. The negator *o'te* is normally used for the negation of a modal, occurring between the auxiliary and the main verb. The negator *'oha* negates only an adjectival verb, occurring between the auxiliary and the state verb. Among them, only *'oha* is compatible with the affirmative mood marker *'a*.

In the preceding section, we have shown that the affirmative mood marker *'a* cannot co-occur with the sentential negators *o'a* and *uk'a*, as already exemplified in (14)-(15), repeated as (21)-(22).

(21) Tsou

<i>(*'a)</i>	<i>o'a</i>	<i>te-'o</i>	<i>uh-ne</i>	<i>maibayx</i>	<i>hohucma.</i>
AFF	NEG	IRR-1S.ABS	get.to-OBL	Chiayi	tomorrow

'I will not go to Chiayi tomorrow.'

- (22) Tsou  
 (\*'a) *uk'a* *ci* *peisu-'u*  
 AFF there.is.no OBL money-1S.POSS  
 'I have no money.'

The incompatibility of the affirmative mood marker 'a with the negators 'ote, teav'a, and o'te is illustrated in (23) and (24).

- (23) Tsou  
 a. (\*'a) 'ote *la* 'aoko *m-imo* *to* *emi!*  
 AFF NEG.IMP HAB continently INTR-drink OBL alcohol  
 'Don't drink alcohol all the time!'  
 b. (\*'a) *teav'a=s'a* *ekuzkuzo-a* *na* *a'o!*  
 AFF NEG.IMP speak.ill.of-TR ABS 1S.ABS  
 'Don't speak ill of me!'

- (24) Tsou  
 (\*'a) *o'te* *meelx* *fiho*  
 AFF NEG be.able.to follow  
 'He cannot follow (it).'

This is not unexpected, given that the particle 'a is affirmative. What is really surprising is that the affirmative mood marker 'a has no problem with the adjectival negator 'oha. Consider (25).

- (25) Tsou  
 'a *mo* 'oha *mafe* *eni.*  
 AFF RL.INTR NEG delicious this.ABS  
 Lit. 'Surely, this is non-delicious.'

It is unclear at this moment why the negator 'oha stands out. Descriptively speaking, the adjectival negator 'oha contrasts with the other negators in that it induces a negation on the lexical rather than sentential level, comparable to the English prefixal negators such as *un-*, *in-*, and *a-*. One may account for the peculiarity in question by excluding a lexical negator from the category of negation. Nonetheless, this is not semantically well-motivated. We leave this for future investigation.

### 3.2 Evidentials

Yu (2015) observes that the affirmative particle *qi'* is incompatible with the evidentials in Mayrinax Atayal, as in (26).

- (26) Mayrinax Atayal (Yu 2015:135-141)  
 a. *m<in>'uwah* *ku'* *pa-quliq* *la.* *qi'*  
 AV<Perf>come Nom thief PF AFF-Part  
 'I'm sure that the thief has come.'  
 b. *\*asi<sup>Evi</sup>* *ga'* *q<um>ualax* *cu'* *sawni* *qi'*  
 seemingly Lnk rain<AV> Past today AFF-Part  
 Intended: 'I'm sure and remind you that it seems as if it rains today.'

However, this does not seem to be the case in Tsou. In Tsou, an evidential is fine with the affirmative mood marker 'a. Compare (27).

(27) Tsou

'a	mo	nana	mxchx	ne	ca'hamu	nehucma.
AFF	RL.INTR	reportedly	rain.INTR	OBL	PLN	yesterday

'Indeed, it was said that it rained in Tainan yesterday.'

Actually, a declarative mood has no difficulty in patterning with an evidential cross-linguistically. Take English for example. As in (28), the declarative adverb *frankly* can co-occur with the evidential adverb *obviously*.

(28) (Cinque 1999:175, Haumann 2007:354)

*Frankly, you obviously have no idea!*

This is predicted by Cinque's Universal Hierarchy of Functional Projections, where a SAP is merged above an EviP; they are not mutually exclusive, as in (29).

(29) SAP above EviP (Cinque 1999:106)

[Mood<sub>speech act</sub> ... [Mood<sub>evidential</sub> ... ]]

A similar account can carry over to the co-occurrence of the affirmative mood marker 'a with the evidential mood marker *nana* exemplified in (27).

### 3.3 Summary

It has been extensively demonstrated that in Tsou, (i) the particle 'a occurs sentence-initially and represents an affirmative speech act mood, heading a SAP, above the entire sentence; (ii) the particle 'a is characteristic of a declarative; (iii) the particle 'a is restricted to the main clause, displaying the MCP; (iv) the particle 'a does not pattern with all the negators except for the lexical negator 'oha; (v) unlike Mayrinax Atayal *qi*', the particle 'a is compatible with an evidential mood.

In the next section, we shall turn to another Formosan language, viz., C'uli' Atayal, for comparison.

## 4 Assurance Speech Act in C'uli' Atayal

### 4.1 A brief introduction to C'uli' Atayal

Atayal is usually divided into two major dialects, Sqliq and C'uli' (Li 1981). Sqliq Atayal is much more well-researched than C'uli' Atayal. In the C'uli' dialect group, the dialect spoken in Chinshui village, Miaoli county, known as Mayrinax Atayal, receives the heaviest attention in the literature (Huang 1995, 2000, Chen 2012, Wu 2013, Yu 2015, among many others). In contrast, the C'uli' Atayal spoken along the Ta'an River in the borders between Miaoli county and Taichung county is rarely studied. This study will fill the gap by looking into the speech act mood in this C'uli' dialect. We will show that the speech act mood in this dialect behaves differently from its Mayrinax counterpart.

Like most other Formosan languages, C'uli' Atayal is a predicate-initial language. The arguments of a predicate normally occur after the predicate and the subject appears sentence-finally, with the obliques intervening between the predicate and the subject. It will become clear shortly that speech act particles occur after the subject in the language.

### 4.2 Final speech act particles in C'uli' Atayal

Unlike other Formosan languages, C'uli' Atayal is rich in its inventory of sentence-final particles that encode various kinds of speech acts. Table 1 sums up their respective functions.

Table 1: The functions of final particles in C'uli' Atayal

discourse function		final particles
Assurance		<u>ay</u>
Informing/warning		<i>lo, yo</i>
Question	Double-checking	<i>ga</i>
	Asking for permission	<i>aw</i>
	Challenging	<i>pi</i>
Encouraging		<i>ki</i>
Miscellaneous		<i>ma, (l)rua, etc.</i>

In this paper, we concentrate on the particle *ay*, which encodes assurance in declarative sentences.

### 4.3 The final particle *ay*

#### 4.3.1 The function and distribution of the final particle *ay*

The final particle *ay* may be used by the speaker to cast out the addressee's doubts and indicate his guarantee of the truth of an utterance. For example, in (30), through the use of the final particle *ay*, the speaker gives a very positive answer to the addressee's concern over his health.

(30) C'uli' Atayal

Q: *lokah=su ga?*  
 strong=2S.ABS Q  
 'You are healthy, aren't you?'

A: *lokah=kung ay.*  
 strong=1S.ABS ASR  
 'Sure! I'm healthy.'

Like the Tsou particle 'a, the final particle *ay* is restricted to declarative sentences. It is not compatible with interrogatives, as in (31).

(31) C'uli' Atayal

a. *m-usa=su inu (\*ay)?* (Wh-question)  
 INTR-go=2S.ABS where ASR  
 'Where are you going?'

b. *asa la ga (\*ay)?* (Yes-no question)  
 so COS Q ASR  
 'That is all, isn't it?'

Neither is it compatible with imperatives, as in (32), nor with exclamatives, as in (33).

(32) C'uli' Atayal

a. *tl'ung (\*ay)! (Imperative)*  
 sit.down ASR  
 'Sit down!'

b. *laxi p-inbug-I (\*ay)! (NEG Imperative)*  
 IMP.NEG CAUS-drink-LA.NA ASR  
 'Don't let him drink (any more)!'

## (33) C’uli’ Atayal

a. *cyakin ba=su (\*ay)!* (Exclamative)  
 INTF know=2S.ABS ASR  
 ‘You’re so wonderful!’

b. *hwa=su ka yayih (\*ay)!* (Wh-exclamative)  
 how.come=2S.ABS bad ASR  
 ‘How bad you are!’

Furthermore, the final article *ay* displays the MCP as well. As in (34), a subordinate clause is typically fronted as a topic in the sentence-initial position and the final particle *ay* is not allowed to occur there.

## (34) C’uli’ Atayal

*m-usa’=su talan (\*ay) ga, bins-ani=kuzing riwan rawzi aw?*  
 INTR-go=2S.ABS PLN ASR TOP buy-BA.NA=1S.ABS glass eye Q  
 ‘If you go to Chuolan, could you buy me a pair of glasses?’

It is also observed that the final particle *ay* should be merged above the whole sentence, as evidenced by the fact that it scopes over all of the other elements in the sentence. Consider (35).

## (35) C’uli’ Atayal

*hal-ay=mu magan yamin ha ay.*  
 go-TR.PJ=1S.GEN take shoes first ASR  
 ‘Surely, I would first go to take my shoes (in a bid to prevent them from being taken away by a dog).’

4.3.2 The final particle *ay* as an assurance marker

Based on the above observations, one may treat the final particle *ay* on a par with the Tsou particle *’a* and take it as an affirmative mood marker. Nonetheless, the affirmative analysis is problematic. Note that unlike the Tsou particle *’a*, the final article *ay* can pattern with a sentential negator. (36) is an example.

## (36) C’uli’ Atayal

*ungat yaw=mu ay.*  
 NEG.EXIS thing=1S.GEN ASR  
 ‘I assure you that I have no other business. (I’m available now.)’

Accordingly, we propose that the final article *ay* occurs as an assurance mood marker rather than an affirmative mood marker, though like the Tsou particle *’a*, it heads a SAP above the entire sentence. Meanwhile, let us assume that like the Tsou particle *’a*, the final article *ay* originates as a SAP<sup>0</sup> and that it ends up in the sentence-final position because the sentence following it shifts to its specifier for pragmatic reasons (presumably for topicalization). The representation and derivation in connection with the final particle *ay* are schematized as in (37).

## (37) C’uli’ CP left periphery (first approximation)

a. [<sub>SAP</sub> *ay* [<sub>TopP</sub> ... ]]]  
 b. [ <sub>TopP</sub> ... [<sub>SAP</sub> *ay* [ <sub>t<sub>TopP</sub></sub> ]]] (TopP fronting)

This analysis conforms to the general pattern of topicalization attested in the language—as mentioned above, a subordinate clause can be fronted as the topic in the language.



## 5 Concluding remarks

We have shown that a declarative mood may receive a special marking in Tsou and C'uli' Atayal, contra the general observation that declarative sentences are normally unmarked (Sadock & Zwicky 1985, König & Siemund 2007). The special declarative marking may consist of an affirmative mood particle 'a in Tsou but an assurance mood particle *ay* in C'uli' Atayal. Table 2 summarizes how the two particles are similar to and different from each other grammatically.

*Table 2: A comparison: 'a vs. ay*

Declarative Particles	Affirmative 'a (Tsou)	Assuring ay (C'uli')
Is it restricted to declaratives?	Yes	Yes
Does it head a SAP?	Yes	Yes
Does it display MCP?	Yes	Yes
Is it incompatible with sentential negation?	Yes	No
Does it occur sentence-initially?	Yes	No

These findings have significant typological and theoretical implications, as detailed in what follows.

### 5.1 Typological implications

It is noteworthy that the two Formosan languages in question are distinct in their inventory of speech act mood particles. As discussed in section 4, speech act mood particles are numerous in C'uli' Atayal and the assurance mood particle *ay* is simply a member of the huge class. In contrast, speech act mood particles are highly limited in Tsou and the affirmative mood particle 'a is very outstanding in the language. This aligns C'uli' Atayal but not Tsou typologically with the speech-act-mood-prominent East Asian languages such as Chinese. Another noticeable typological difference between C'uli' Atayal and Tsou is that the former is characterized by sentence-final speech act mood particles but the latter by sentence-initial speech act mood particles. Still, these two Formosan languages contrast sharply with familiar languages like English. In English, special markings for declaratives are primarily concerned with adverbs such as *frankly* rather than particles. In Cinque's view, a declarative mood would surface as the head of an SAP in these two Formosan languages but as the specifier of an SAP in English. This is consistent with the realization of adverbial modifiers in Formosan languages versus in English—they occur as heads of higher functional projections in the former but as their specifiers in the latter (Chang 2009).

### 5.2 Theoretical implications

It has been demonstrated that the speech act mood particles in Tsou and C'uli' Atayal are governed by universal grammatical constraints such as Cinque's Universal Hierarchy of Functional Projections or Haegeman's MCP. It is also shown in Tsou that the speech act mood particle can attract clitics and interact closely with other sentence elements such as negators and evidentials. All of these suggest that a speech act mood should not be excluded from UG. It is in the CP periphery but not peripheral or irrelevant/trivial to the core grammar. This represents a great departure from the traditional generative view but accords nicely with the recent trends in syntax (Rizzi 1997, Cinque 1999, Speas & Tenny 2003, Haegeman & Hills 2013, among many others). In his split CP hypothesis, Rizzi (1997, 2013) claims that complementizers such as *that* and *whether* in English represent illocutionary force or speech acts and distinguish clause types and that they head a  $F_{\text{orce}}P$  on the top of the CP periphery, as illustrated in (38) and (39).

(38) a. I know that she will come.

b. I wonder whether she will come.

(39) The Split CP (Rizzi 1997:297)

$[_{\text{ForceP}} \text{Force}]_{\text{TopP}^*} \text{Top}^0 [_{\text{FocP}} \text{Foc}^0 [_{\text{TopP}^*} \text{Top}^0 [_{\text{FinP}} \text{Fin}^0$

The findings of this study do lend support to his split CP hypothesis, but do not support his taking  $F_{orce}P$  as representing speech acts on top of the whole sentence. Recall that in Tsou, the affirmative mood particle 'a exhibits the MCP and is ruled out from the complement clause, as already shown in (13), repeated as (40).

## (40) Complement in Tsou

'a os-'o cohiv-i ho (\*'a) mi-ta avzovzo no peisu.  
 AFF RL.TR-1S.ERG know-LA COMP AFF RL.INTR-1S.ABS be.lack.INTR OBL money  
 'I do know that he is short of money.'

It is true that complementizers such as *that* and *whether* do represent a  $F_{orce}P$  or a Clause-typing Phrase (CtP). However, it is dubious that a  $F_{orce}P/CtP$  construes a speech act and occupies the highest position in the sentential structure. Rather, it is more likely that the projection that really hosts a speech act and is structurally superior is what Cinque (1999) labels a speech act phrase (SAP). It becomes evident now that an SAP and a  $F_{orce}P/CtP$  should be distinguished, with the former merged above the latter. This analysis further split-up gives the CP gives a satisfactory account for the SAP- $F_{orce}P/CtP$  asymmetry with respect to the MCP; that is, an SAP is in accordance with the MCP, but a  $F_{orce}P/CtP$  exempt from it. The differences between an SAP and a  $F_{orce}P/CtP$  can be summarized in Table 3.

**Table 3:** SAP vs.  $F_{orce}P$

Phrase	SAP	$F_{orce}P/CtP$
Does it display MCP?	Yes	No
Does it encode a speech at?	Yes	No

It follows that the CP left periphery in UG might be roughly schematized as in (41).

## (41) The CP left periphery in UG

$[_{SAP} SA^0]$   $[_{ForceP} Force^0]$   $[_{TopP^*} Top^0]$   $[_{FocP} Foc^0]$   $[_{TopP^*} Top^0]$   $[_{FinP} Fin^0]$

This points to the conclusion that a sentence is structurally projected as a full-fledged SAP, whereas any embedded clause is reduced in nature, at least short of an SAP.

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# SUCCESSIVE-CYCLIC CASE ASSIGNMENT: AMIS MAIN CLAUSES AND GERUNDS\*

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## Abstract

This paper investigates the case patterns of main clauses and gerunds in Amis. I argue that the case alternation between Actor Voice clauses and non-Actor Voice clauses in Amis results from their aspectual differences. I propose a revised Dependent Case model in which realization of unmarked case is category-sensitive and case assignment applies successive-cyclically at each phase. I further illustrate that roots in Amis exhibit nominal properties that interact with case assignment. This allows for a uniform source of genitive case on possessors and agents in gerunds and non-Actor Voice clauses.

**Keywords:** case, perfective, root, category, Amis

**ISO 639-3 codes:** ami

## 1 Introduction

This paper investigates the case patterns of main clauses and gerunds in Amis.<sup>1</sup> Amis exhibits a four-way voice system that correlates with a case alternation. Observe first that the same genitive case marks both the possessor in (1)<sup>2</sup> and the agent of a Patient Voice (PV), Locative Voice (LV), and Instrumental Voice (IV) clause in (2a-b). In an Actor Voice (AV) clause, as in (3), the agent receives nominative case instead.

(1) *o*<sup>3</sup> 'orang no tawki  
O lobster GEN boss  
'the boss' lobsters'

(2a) *Tangtang-en/-an no tawki ko-ra 'orang.* (Patient Voice (PV) and Locative Voice (LV))  
cook-PV/-LV GEN boss NOM-that lobster  
'The boss cooked those lobsters.'

(2b) *Sa-pa-kaen no tawki to posi ko-ra 'orang.* (Instrumental Voice (IV))  
IV-CAUS-eat GEN boss ACC cat NOM-that lobster  
'Those lobsters are what the boss fed the cats with.'

(3) *Mi-tangtang ko tawki to-ra 'orang.* (Actor Voice (AV))  
IPFV.AV-cook NOM boss ACC-that lobster  
'The boss is cooking those lobsters.'

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<sup>1</sup> Amis is a VSO Formosan language spoken in eastern and southern Taiwan. The dialect reported in this paper is the Central dialect. Data were collected through in-person elicitations and online correspondences. All native speaker consultants come from Fuli Township, Hualien County.

<sup>2</sup> Glosses not included in the Leipzig Glossing Rules: LNK=linker, P=preposition, REDUP=reduplicant, STA=stative.

<sup>3</sup> By and large, *o* seems to mark nominal predicates. Its distribution is similar to *ko* in Niuean and Tongan and their counterpart in other Polynesian languages (Chung 1978; Otsuka 2000; Potsdam & Polinsky 2011, a.o.). See Chen (2018) for a description of the environments where *o* appears.

Much previous research on Amis and related languages claimed a direct link between voice morphology and case alternation (Kroeger 1993, V. Chen & Fukuda 2016, a.o.), and that the genitive case marking non-AV (NAV) agents is an inherent agentive case and is only homophonous with the genitive case on possessors (Aldridge 2004 et seq., a.o.). In this paper, I propose that case realization in Amis is sensitive to the category of the domain to which case assignment applies. I argue that genitive case on possessors and NAV agents has the same source: both are assigned in a nominal domain, which exists because roots in Amis are initially nominal. Moreover, I propose that case assignment applies at each phase and that nominative case on AV agents results from overwriting of genitive case assigned previously. I further argue that the absence of this overwriting in (2a-b) should be attributed to the perfective aspect associated with NAV clauses. That is, aspect, instead of voice morphology, is responsible for the case alternation in Amis.

The paper is organized as follows: in section 2, I illustrate the nominal properties of roots in Amis with a focus on case patterns in phrases headed by a bare root. In section 3, I apply the case assignment system developed in section 2 to AV main clauses and gerunds. In section 4, I show that NAV main clauses are perfective and how that interacts with case assignment. Before I conclude, in section 5, I discuss data that show movement of a nominal is not a prerequisite for multiple case assignment in Amis.

## 2 Bare roots

Bare (affixless) roots that denote entities and those that denote events behave alike in Amis in terms of distribution and case marking patterns. First, plural reduplication can apply to either type of root, as in (4), yielding either a plurality of entities or a plurality of events.<sup>4</sup> Next, voice morphology, such as AV *pi-* or PV *-en*, attaches directly to either type of root, as in (5). On the other hand, (6) shows that the immediate future reduplication (*Ca* reduplication) only applies to roots that are already inflected with voice, and cannot apply directly to a bare root. (4)-(6) suggest that the subcategorization requirement of some affixes treats bare roots, regardless of their meaning, as one category, and distinguishes them from roots that are inflected with voice.

- (4) *lopas* ‘peach’      *cefos* ‘spray’      (Plural reduplication)  
*lopa<lopa>s* ‘peaches’      *cefo<cefo>s* ‘spray repeatedly’
- (5) *pi-lopas* ‘pick peaches’      *pi-cefos* ‘spray’      (Subcategorization of voice morphology)  
*lopas-en*      *cefos-en*
- (6) *ma-mi-cefos* ‘about to spray’ (\**ca-cefos*)      (Immediate future reduplication)  
*ca-cefos-en*

Furthermore, case marking patterns within phrases headed by a bare root are identical whether the root denotes an entity, e.g. *codad* ‘book’ in (7a), or an event, e.g. *cefos* ‘spray’ in (7b). In both, the higher nominal, the possessor *tawki* ‘boss’ in (7a) or the agent *tawki* ‘boss’ in (7b), receives genitive case. If another nominal is present, such as *mama* ‘father’ in (7a) or *nanom* ‘water’ in (7b), it receives accusative case.

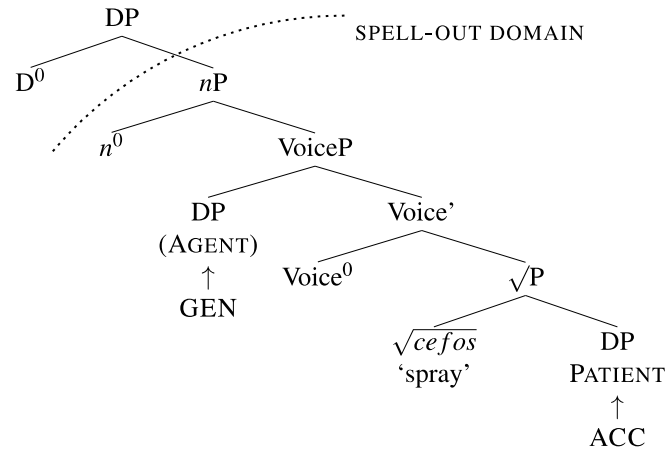
- (7a) *Mi-nengneng kako* [ *to codad no tawki (ci mama-an)* ]<sup>5</sup>.  
 IPFV.AV-watch NOM.1SG ACC book GEN boss ACC father-ACC  
 ‘I am reading the boss’ books (about fathers).’
- (7b) [ *O cefos no tawki (to nanom)* ] *ko sa-ka-cepa' no paenan*.  
 O spray GEN boss ACC water NOM IV-STA-wet GEN floor  
 ‘The boss’ spraying (water) is why the floor is wet.’

<sup>4</sup> I abstract over the phonological and semantic details of plural reduplication. See Lu 2003 for more discussion.

<sup>5</sup> Accusative on proper names and kinship terms is realized as *ci*-NOMINAL-*an*, instead of *to*, which occurs elsewhere.

Based on the data illustrated above and in anticipation of the discussion that follows, I propose that Amis roots uniformly lack a category in the lexicon. A root is merged with an internal argument first if it selects for one. Then the Root Phrase is nominalized by  $n^0$ , and may be further verbalized when a voice affix is attached, which I posit is merged at  $v^0$ .<sup>6</sup> (8) illustrates a simplified structure of the bare root phrase in (7b).<sup>7</sup>

## (8) Structure and case derivation of bare root phrases



Observe again that in the bare root phrase in (7b)-(8), the higher nominal receives genitive case and the lower nominal accusative case. (9a) in addition shows that the agent of (7b) can be null, but the patient must still surface with accusative case (cf. Sakha in Baker & Vinokurova 2010). This contrasts with bare root phrases headed by an intransitive root, such as (9b), where the single nominal must receive genitive case.

- (9a) *o cefos \*no/to nanom* (9b) *o leneng no/\*to tamina'*  
 O spray \*GEN/ACC water O sink GEN/\*ACC boat  
 'spraying water' 'the boats' sinking'

We see a similar distribution of case within gerunds.<sup>8</sup> Unlike the intransitive bare root phrase in (9b), gerunds where the (nominalized) verb is prefixed by the stative *ka-* can optionally have an overt agent, as in (10a). The agent receives genitive case and the patient accusative case. Without an overt agent, however, as in (10b), the patient receives genitive case instead. This suggests that stative-prefixed verbs do not inherently select for an agent, though they are compatible with one.

- (10a) *Faheka kako* [GERUND *to ka-'ari ni Mayaw to kaysing*].  
 surprised NOM.1SG ACC STA-break GEN PN ACC bowl  
 'I am surprised at the bowls' breaking by Mayaw.'

- (10b) *Faheka kako* [GERUND *to ka-'ari no/??to kaysing*].  
 surprised NOM.1SG ACC STA-break GEN/??ACC bowl  
 'I am surprised at the bowls' breaking.'

<sup>6</sup> I discuss the aspectual properties of main clauses in section 4. Besides aspect, voices in Amis each contribute semantically to the verbs derived. I put this aside in this paper and will treat voices simply as verbalizers. Besides voice morphology, stative *ka-* and causative *pa-* can also attach directly to bare roots, e.g., *kohaw* 'soup', *ka-kohaw* 'soup already eaten', *pa-kohaw* 'give soup to someone (to eat)'. I will treat both of these also as instances of Voice<sup>0</sup>.

<sup>7</sup> In (8), Voice<sup>0</sup> is the head that introduces the external argument. In a main clause, such as (13), VoiceP is merged below Voice<sup>0</sup>, which I posit is where voice morphology is added. Locating VoiceP below vP is supported by bare root phrases, such as (9a-b), which show that presence of the external argument does not depend on voice morphology. See Chen (2018) for more discussion on this issue.

<sup>8</sup> I discuss gerunds in more detail in section 3. It suffices for now to treat them as bare root phrases.

The case patterns in (7)-(10) are easily captured by the Dependent Case model (Marantz 1991), which holds that case assignment is based on the structural relationship among nominals that need case. A nominal that is c-commanded by another one is assigned dependent case; otherwise, it receives unmarked case.<sup>9</sup>

I propose that Amis assigns case by the ordered rules in (11a-c) and each time a phase head is merged, case assignment applies to the complement of the phase head (*Spell-Out domain*). I assume that  $D^0$ ,  $v^0$ , and  $C^0$  are phase heads in Amis and there are two category heads:  $n^0$  and  $v^0$ .

- (11a) If there are two distinct DPs in the same phase such that  $DP_1$  c-commands  $DP_2$ , and if  $DP_1$  is unmarked for case, assign accusative to  $DP_2$ .  
 (11b) If a DP does not receive dependent case, it is realized as genitive in a nominal domain, and nominative in a verbal domain.  
 (11c) A Spell-Out domain is nominal if the highest category head is  $n^0$  and it is verbal if the highest category head is  $v^0$ .

I illustrate with the transitive bare root phrase in (7b), with the corresponding structure in (8). Assuming bare root phrases are merged with  $D^0$  on top of  $nP$ , merger of  $D^0$  triggers Spell-Out of  $nP$ . By (11a), the patient receives accusative case. By (11b-c), the agent receives genitive case, given that  $n^0$  is the highest category head in the Spell-Out domain. This derives the case patterns observed.

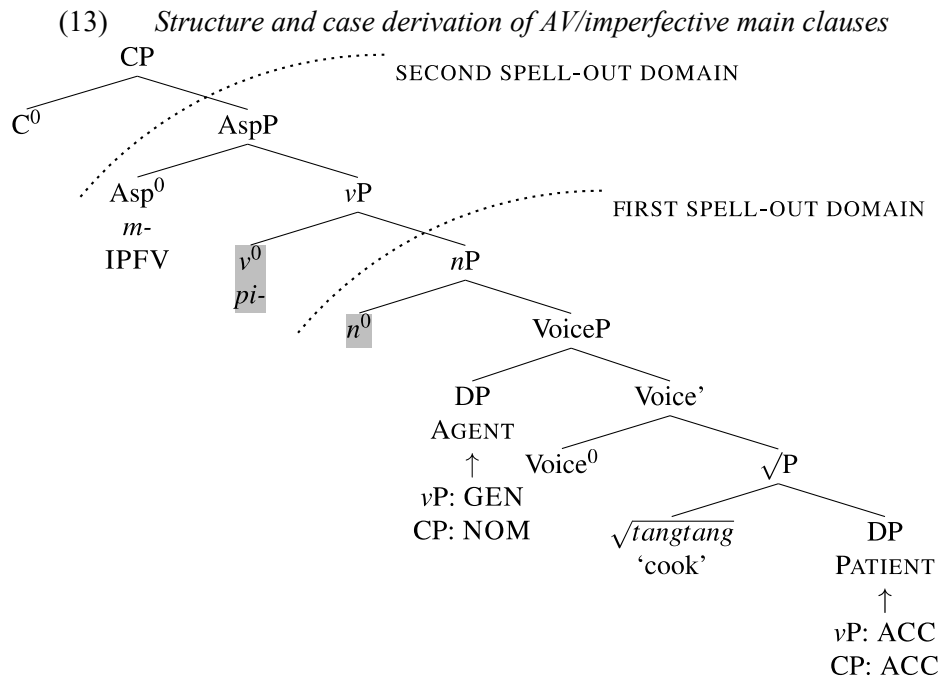
Before ending this section, I note that positing category-neutral roots and overt category-defining heads, as proposed above, allows us to have a uniform structure-based definition of Spell-Out domain categories throughout this paper. To account for the data here, however, alternatives where all arguments are visible in the first case assignment and where realization of unmarked case varies with the category of a case assignment domain will suffice. We will need independent evidence to justify the particular implementation adopted here, but this has no direct bearing on the main proposal of this paper.

### 3 Successive-cyclic case assignment

In the case assignment system developed in section 2, I proposed that each time a phase head is merged, case assignment applies. Accordingly, in a more complex structure that contains more than one phase head, such as a finite clause, case assignment applies more than once. That is, this proposal allows for phase-based successive-cyclic case assignment. Moreover, we also saw that in Amis, the first case assignment always applies to a nominal domain because roots in Amis are nominalized first. In addition, voice morphology is not required for case assignment, as the case patterns of bare root phrases show. In this section, I will show that the same system also derives the case patterns of AV main clauses and gerunds.

- (12) *Mi-tangtang ko tawki to-ra 'orang.*  
 IPFV.AV-cook NOM boss ACC-that lobster  
 ‘The boss is cooking those lobsters.’

<sup>9</sup> Amis does not have a clear example of lexical case, so I will leave this aside.



We start with AV main clauses, e.g. (12), repeated from (3), with the simplified structure in (13). AV main clauses in Amis are imperfective. I postpone discussion of aspect until section 4. For now, we only need to note that imperfective aspect does not interact with case assignment in Amis. In (13), the first case assignment applies when the AV voice *pi-* is merged at  $v^0$ . By Rule (11a), the patient receives accusative case. By Rules (11b-c), the agent receives genitive case, given that  $n^0$  (shaded) is the highest category head in the domain. The first case assignment in main clauses is identical to case assignment in bare root phrases (cf. (7b)), except that in a clause, the first phase head is  $v^0$  instead of  $D^0$ . Next, the second case assignment applies when  $C^0$  is merged. By Rule (11a), the patient receives accusative case again. However, this time, by Rules (11b-c), the agent receives nominative case, given that  $v^0$  is the highest category head in this domain.

In AV clauses, what surfaces are the results of the second case assignment. To account for this, I propose a variant of Pesetsky's (2014) *One-Suffix Rule* in (14). Due to (14), results of the final case assignment overwrite those of the previous case assignment.

(14) *One Case Constraint*: In an information-structurally neutral context, delete all but the outermost case.

The *One Case Constraint* only applies in an informational-structurally neutral context. Stacking two or more cases, each assigned at a different phase, on a single nominal is possible when the nominal is a contrastive topic, as in (15). I will not discuss overt case-stacking further in this paper. See Chen (2018, to appear) for more discussion.

(15) *Mi-tangtang ko-no tawki to-ra 'orang.*  
 IPFV.AV-cook NOM-GEN boss ACC-that lobster  
 '[The boss]<sub>CT</sub> is cooking those lobsters.'

We turn to gerunds now. Observe that, unlike in main clauses, case marking does not vary with voice morphology in gerunds, as (16a-b) show. Whether the verb is marked with AV *pi-*, PV *-en*, or LV *-an*, the agent receives genitive case and the patient accusative case. This suggests that voice morphology does not interact with case assignment in Amis. In section 4, I attribute the case alternation between AV and NAV main clauses to viewpoint aspect.

(16a) *Lipahak ko posi* [<sub>GERUND</sub> *to-(ya) pi-tangtang no tawki to-ra 'orang* ].  
 happy NOM cat ACC-(that) AV-cook GEN boss ACC-that lobster  
 'The cats are happy about the boss' cooking those lobsters.'

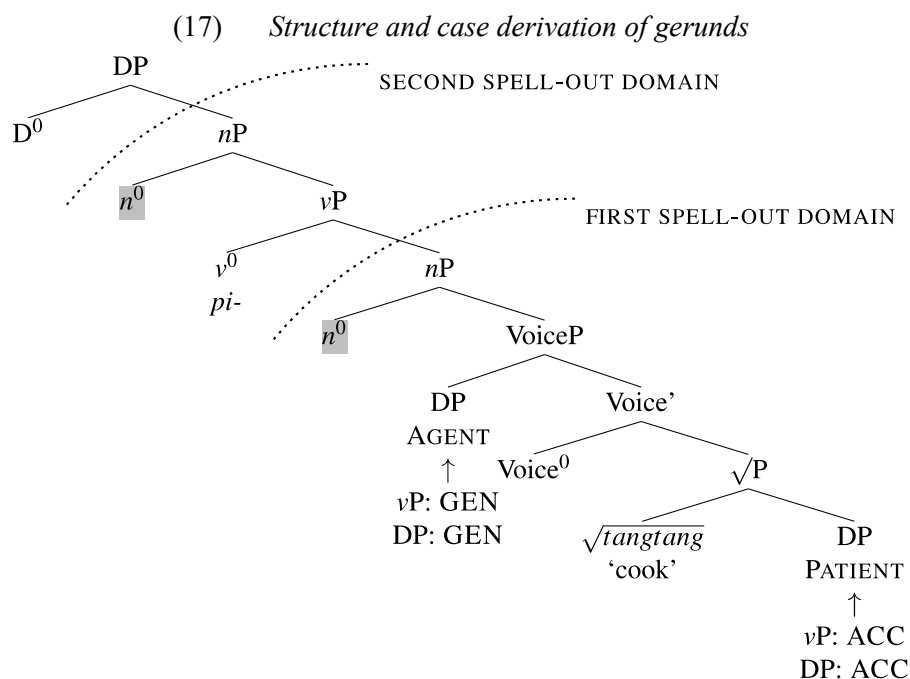


- (16b) *Lipahak ko posi* [GERUND *to(-ya) tangtang-en/-an no tawki to-ra 'orang* ].  
 happy NOM cat ACC-(that) cook-PV/LV GEN boss ACC-that lobster  
 ‘The cats are happy about the boss’ cooking those lobsters.’

In addition, in (16a-b), the gerunds themselves receive case and can be marked by a demonstrative. This shows that gerunds have the external syntax of a DP in Amis. I posit that gerunds contain  $vPs^{10}$  that are nominalized by another  $n^0$ . The higher  $nP$  is then merged with  $D^0$ , as in (17). Amis has at least two other types of gerund, based on case patterns and word order possibilities. I will not discuss these examples in this paper. Importantly, these other types of gerund are also possible with any voice morphology, and voice morphology again has no effect on the case marking of nominals.

In (17), the first case assignment applies when the lower  $n^0$  is merged. By Rule (11a), the patient receives accusative case. By Rules (11b-c), the agent receives genitive case, as (the lower)  $n^0$  is the highest category head in this domain. This assignment is completely identical to the first case assignment in main clauses or bare root phrases. Next, in a gerund, the second case assignment applies when  $D^0$  is merged, yielding identical results as the first case assignment, because (the higher)  $n^0$  is also the highest category head in the second Spell-Out domain. The *One Case Constraint* in (14) applies to this derivation vacuously, since the two rounds of case assignment result in identical case patterns.

Positing multiple case assignments might seem superfluous given the discussion so far, since the case patterns that surface always correspond to the results of the second case assignment, except in (15). I argue in the next section that NAV clauses support the presence of two rounds of case assignment.



#### 4 Perfective aspect and case assignment

I begin this section by presenting diagnostics that show NAV main clauses in Amis are perfective and AV main clauses are imperfective. I then argue that genitive marking on NAV agents is comparable to differential subject marking in perfective clauses in languages such as Hindi-Urdu. Based on Bjorkman (2011, 2015), I propose that perfective aspect requires additional licensing. This is achieved by Agree between the perfective aspect head and the highest  $\phi$ -bearing element, typically the agent in a transitive clause. I further posit that the agent becomes invisible to additional case assignment as a result of this Agree relation, and therefore, surfaces with genitive case. Moreover, I argue that the Agree relation between perfective aspect and the agent accounts for a word order restriction found only in NAV main clauses.

<sup>10</sup> Or imperfective AspP. Applying the rules in (11) yields identical results either way. I discuss a potential example of gerunds with perfective aspect at the end of section 4.2.

#### 4.1 Diagnostics of aspect

It has been noted in previous works on Amis, e.g. Wu (2006), that PV clauses are typically perfective whereas AV clauses are often interpreted as progressive.<sup>11</sup> Moreover, with some predicates, AV clauses have an additional reading sometimes described as future (Wu 2016). Below I apply three diagnostics to show that in Amis, NAV clauses in general are perfective and AV clauses are imperfective. Specifically, NAV clauses in Amis entail the initiation point of an event. In addition, LV *-an* clauses, but not PV *-en* clauses, often but not always entail culmination of an event. Moreover, the so-called future reading associated with AV clauses is only possible with Achievement and Accomplishment events and is similar to the preliminary stage reading found in English when we apply the progressive aspect to an Achievement event, e.g. *Annie is winning the game*. At the end of this section, I discuss properties of IV *sa-* that make the diagnostics used here not fully applicable to IV.

Two things to note before we discuss the diagnostics: first, for these diagnostics to work as intended, it is important that we control for the event type of the clauses. The aspectual contrast between AV and NAV clauses seems to be the sharpest with Accomplishment events. The examples were constructed accordingly. Second, it has often been reported that PV *-en* in Amis is associated with a future reading not found with the other NAV voices (Wu 2016). Adding a temporal adverbial indicating that the event has already taken place, as is done in the examples below, seems to make this reading less salient. In addition, based on my own elicitation, a futurate, planned event reading, similar to what is found with English *have*-causatives (Copley & Harley 2009), might be a more accurate description of this additional flavor of PV *-en* in Amis.

The first diagnostic we will use examines the temporal relation between an adjunct clause and a main clause. The same main clause presented in the perfective and the imperfective aspect receives different interpretations when it is modified by a temporal adjunct clause that describes an instantaneous event, e.g. *when Annie arrived*. In English, when the main clause event is presented without endpoints (*imperfective*), it is interpreted as occurring simultaneously with the adjunct clause event: e.g., *When Annie arrived, Clark was singing*. When the main clause event is presented with endpoints (*perfective*), hearers tend to interpret it as occurring or beginning after the adjunct clause event: e.g., *When Annie arrived, Clark sang the song*. We found a similar contrast between AV and NAV clauses in Amis. In (18a), the AV main clause event was in progress when the adjunct clause event took place, whereas in (18b) with PV *-en*, the main clause event started right after the adjunct clause event, and in (18b) with LV *-an*, the main clause event took place before the adjunct clause event. (18a-b) suggest that PV and LV clauses entail at least the initiation point of an event, whereas AV clauses present only an interval of an event.

(18) *Diagnostic 1: Interaction with ‘when’-clauses*

(18a) *Ya ma-padeng i honi ko-ya dingki i,*  
that IPFV.STA-go.off P moment NOM-that light TOP

*mi-'owak-to<sup>12</sup> ko tawki to-ya epah.*  
IPFV.AV-drink-TO NOM boss ACC-that wine  
'When that light went off just now, the boss was drinking that (glass of) wine.'

(18b) ..., *'owak-en/-an-to no tawki ko-ya epah.*  
drink-PV/LV-TO GEN boss NOM-that wine  
'When that light went off just now, the boss started to drink/already drank that (glass of) wine.'

<sup>11</sup> Amis does not have overt tense morphology. All four voices are compatible with adverbials that indicate different temporal specifications.

<sup>12</sup> The aspectual suffix *-to* is compatible with all four voices and is not restricted to either perfective or imperfective aspect. It seems to indicate change of state. For some speakers and in some of the examples, such as (18), presence or absence of *-to* changes the interpretation. The exact function of *-to* is beyond the scope of this paper.

Next, in an AV clause, as in (19a), a clause-initial temporal phrase<sup>13</sup> is interpreted as a durative adverbial, describing an interval of the event. In addition, AV clauses do not entail termination or completion of the event. Thus, it is coherent to continue (19a) with a clause asserting that the event is still in progress or the event (if telic) has not culminated. In (19b-c)<sup>14</sup>, the same clause-initial temporal phrase is interpreted as completive, describing the time it took for the event to terminate or complete. PV and LV clauses differ in whether or not termination or completion of an event is entailed. LV clauses typically suggest that it is and thus, continuing (19c) with a clause asserting that the event is still in progress or has not culminated is contradictory. There are exceptions to this, however. It seems that, for LV clauses, termination or culmination might only be a strong inference but not an entailment. On the other hand, PV clauses do not entail culmination, but speakers' judgment on whether or not PV clause events must have terminated varied. That is, they sometimes rejected continuing (19b) with a clause asserting that the event is still in progress.

(19) *Diagnostic 2: Interpretation of clause-initial temporal phrases*

(19a) *Tolo polo' a tatokian mi-sanga' ko tawki to cecay a sapad.*  
 three ten LNK hour IPFV.AV-make NOM boss ACC one LNK table

*Kirami taha-matini mi-sanga' ho cingra / caay ho ka-sanga'.*  
 but until-now IPFV.AV-make still NOM.3SG / NEG still STA-make  
 'The boss has been making a table for 30 hours. But until now, he's still making it/(it) isn't made yet.'

(19b) *I 'ayaw no cecay a lipay, tolo polo' a tatokian sanga'-en no tawki*  
 P front GEN one one week three ten LNK hour make-PV GEN boss  
*ko cecay a sapad.*  
 NOM one LNK table

*Kirami tahamatini %misanga' ho cingra / #caay ho kasanga'.*  
 'A week ago, the boss made a table in 30 hours. But until now, %he's still making it/#(it) isn't made.'

(19c) *Tolo polo' a tatokian sanga'-an no tawki ko cecay a sapad.*  
 three ten LNK hour make-LV GEN boss NOM one LNK table

*#Kirami tahamatini misanga' ho cingra / caay ho kasanga'.*  
 'The boss made a table in 30 hours. #But until now, he's still making it/(it) isn't made yet.'

More work is necessary for a better understanding of the relationship between voice and viewpoint aspect in Amis. The generalization at the moment is that AV clauses present only an interval of an event, whereas PV and LV clauses entail at least the initiation point of an event, and sometimes in addition strongly suggest the final endpoint of the event has occurred. This is consistent with (18a-b).

The third diagnostic we will apply examines whether the preliminary stage reading is available with a particular voice. The preliminary stage reading here refers to the interpretation found, for example, with English progressive aspect when it applies to an Achievement event, e.g., *Annie is winning the game*. In Amis, this reading is possible with AV clauses describing an Achievement or an Accomplishment event. Therefore, in (20a) it is consistent to continue the AV clause with another clause asserting that the event did not occur at all in the end. The preliminary stage reading is not available with AV clauses describing an Activity or a Semelfactive event, or with any PV/LV clauses, regardless of event type. Thus, following up any of these clauses with a clause claiming that the event did not occur in the end is contradictory. (20b-c) illustrate this

<sup>13</sup> Clause-internal temporal phrases are marked by either accusative case or the preposition *i*. They are interpreted differently from clause-initial temporal phrases. In addition, the clause-initial temporal phrase in (19a-c) can also have a punctual reading, e.g. at 8 o'clock. I use '30 hours' in these examples to rule out this reading.

<sup>14</sup> In (19b), without 'a week ago' at the beginning, the temporal phrase '30 hours' receives an inceptive reading: 'The boss is starting to make a table in 30 hours.' This might have to do with the futurate reading often found with PV -en clauses.

with a PV and LV clause. The preliminary stage reading is common for imperfective aspect across languages for Achievement events (Smith 1997). AV main clauses in Amis offer another example of this pattern.

(20) *Diagnostic 3: (Un)availability of the preliminary stage reading*

(20a) *I 'ayaw no cecay a tatokian, mi-tangtang ko tawki to-ra 'orang.*  
 P front GEN one LNK hour IPFV.AV-cook NOM boss ACC-that lobster

*Kirami taha-matini, caay pi-tefing-tefing cingra.*  
 but until-now NEG AV-REDUP-touch NOM.3SG

‘An hour ago, the boss was planning to cook that lobster. But until now he hasn’t even touched (it).’

(20b) *I 'ayaw no cecay a tatokian, tangtang-en/-an no tawki ko-ra 'orang.*  
 P front GEN one LNK hour cook-PV/-LV GEN boss NOM-that lobster

*#Kirami, tahamatini caay pitefingtefing cingra.*

‘An hour ago, the boss cooked that lobster. #But until now, he hasn’t even touched (it).’

In fact, the AV clauses in (18a), (19a), and (20a) are all ambiguous between the progressive reading and the preliminary stage reading. For interpreting these diagnostics, what matters is that for (18) and (19), the progressive reading is only possible with AV clauses, and for (20), the preliminary stage reading is also only possible with AV clauses (for some event types). When one applies these diagnostics in Amis, it is also important to try to control for the temporal specification whenever possible. As discussed at the beginning of this section and in footnote 14, having an adverbial indicating explicitly that the event has already taken place makes the futurate reading associated with PV *-en* less salient. This futurate reading can shift the interpretation of the same PV clause and obscure the similarity between PV *-en* and LV *-an*.

The results of these diagnostics support the claim that AV main clauses are imperfective in Amis and NAV clauses are perfective. Moreover, the imperfective interpretation associated with AV main clauses does not depend on what I have been glossing as AV, the prefix *pi-*. Instead, the interpretation correlates with the prefix *m-*. *Pi-* surfaces in this form in negatives, imperatives, gerunds, and on verbs with more than one voice affix (e.g. (21b)). Many of these do not have the imperfective interpretation found in AV main clause declaratives. Similarly, presence of PV *-en* or LV *-an* in contexts other than main clause declaratives also does not clearly have the perfective interpretation discussed above. Based on these observations, I propose that in Amis, the imperfective aspect is realized as *m-* and the perfective aspect is morphologically unmarked.<sup>15</sup> *M-* attached to AV *pi-* surfaces as *mi-*, and relatedly, *m-* attached to stative *ka-* surfaces as *ma-*.

Note that the diagnostics above only show that PV clauses entail the initiation point of an event. This is not the most common definition of perfective aspect, which includes both the initial and the final points of an event, and typically entails culmination. In fact, the interpretation we found with PV clauses seems most similar to what Smith (1997) refers to as *neutral aspect*, which includes only the initiation point of an event. However, given that culmination is in fact not entailed in the perfective in many languages (Altshuler 2013), I will refer to the aspectual contrast between AV and NAV clauses simply as a contrast between imperfective and perfective.

I end this section with a brief discussion of IV clauses. I included only PV and LV examples in the illustration above because IV clauses in Amis exhibit properties that make them not immediately comparable to other voices. First, IV *sa-* rarely attaches directly to a bare root. Instead, it attaches to a stem that is already modified by some other morphology: e.g., causative *pa-* in (21a), repeated from (2b), or AV *pi-* in (21b), among other possibilities. In (21a-b), attaching IV *sa-* directly to a bare root, as in *sa-kaen* or *sa-nengneng*, is ruled out. In addition, both (21a-b) are associated with a pseudocleft-like reading, as the translation indicates. Applying the aspectual diagnostics above, in particular (18) and (20), to (21a-b) returns infelicitous sentences, possibly because of this extra reading associated with IV. To the extent that the diagnostic in (19) is acceptable when applied to (21b), the clause-initial temporal phrase is interpreted as completive, similar to what we found with PV and LV clauses. In addition, IV clauses do not seem to have the progressive interpretation found in AV clauses. Thus, the behavior of IV clauses does parallel PV and LV clauses. This is consistent with the

<sup>15</sup> I limit this proposal to matrix declaratives for now and put aside how this can be extended to other clause types. I discuss, however, in Appendix A, a potential counterexample to the claim, which involves the prefix *ma-*.

claim that NAV clauses in Amis are perfective in general, although we will need to examine IV clauses in more detail to verify this.

(21a) *Sa-pa-kaen no tawki to posi ko-ra 'orang.*  
 IV-CAUS-eat GEN boss ACC cat NOM-that lobster  
 ‘Those lobsters are what the boss fed the cats with.’

(21b) *Sa-pi-nengneng ni Panay to tilift ko-ra dadingo.*  
 IV-AV-watch GEN PN ACC TV NOM-that glasses  
 ‘Those glasses are what Panay watched TV with.’

#### 4.2 Perfective aspect requires additional licensing

Differential subject marking conditioned by aspect is not uncommon across languages. For example, in Northern Russian and Hindi-Urdu, subjects of perfective clauses receive genitive case and ergative case, respectively, as in (22a-b). On the other hand, subjects of imperfective clauses typically receive nominative case. This is reminiscent of the contrast between AV and NAV clauses. I showed in the previous section that AV clauses are imperfective and NAV clauses are perfective. In addition, we also saw that the agent of AV clauses receives nominative case, whereas that of NAV clauses receives genitive case.

(22a) *U traktora tut proexano.* (N. Russian: Bjorkman 2015:14)  
 at tractor.GEN here passed.by.PTCP.N.SG  
 ‘A tractor has passed by here.’

(22b) *Rahul-ne kitaab parh-ii th-ii.* (Hindi-Urdu: Bjorkman 2015:31)  
 Rahul-ERG book(F) read-F.SG(PFV) be.PST-F.SG  
 ‘Rahul had read the book.’

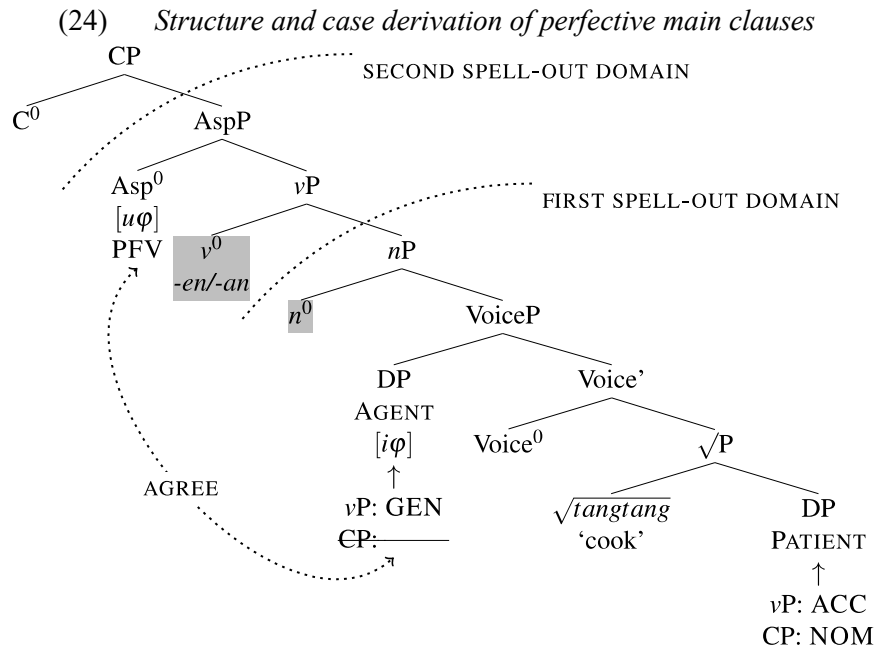
Following Bjorkman (2011, 2015), who proposed that perfective aspect contains a prepositional or  $\phi$ -feature that needs to be licensed, I posit that in Amis, perfective aspect contains an uninterpretable  $\phi$ -feature that needs to be valued, whereas imperfective aspect is unspecified and is realized as *m-*. The  $[\text{u}\phi]$  feature of perfective aspect is valued by agreeing with the highest element containing an  $[\text{i}\phi]$  feature, typically the external argument of a transitive clause. In addition, I propose that, due to this Agree relation, the external argument becomes invisible to further case assignment.<sup>16</sup> I illustrate below how this interacts with the proposed case assignment system to derive the case patterns of perfective (NAV) clauses. In section 4.3, I show that the Agree relation also affects word order possibilities in perfective clauses.

(23) *Tangtang-en/-an no tawki ko-ra 'orang.*  
 cook-PV/-LV GEN boss NOM-that lobster  
 ‘The boss cooked those lobsters.’

I illustrate with the simplified structure in (24) for the PV/LV main clause in (23), repeated from (2a). In (24), the first case assignment applies when  $v^0$  is merged. By Rule (11a), the patient receives accusative case. By Rules (11b-c) and given that  $n^0$  is the highest category head in this Spell-Out domain, the agent receives genitive case. Next, the perfective aspect head  $\text{Asp}^0$  is merged, which contains an  $[\text{u}\phi]$  feature. The perfective  $\text{Asp}^0$  values its  $[\text{u}\phi]$  feature by agreeing with the agent, the highest element that bears an  $[\text{i}\phi]$  feature in (24). As a result of this Agree relation, the agent becomes invisible to further case assignment. In (24), the strikethrough indicates that the agent is inactive for case assignment at the CP phase. Next, when  $C^0$  is merged, another round of case assignment applies. This time Rule (11a) does not apply because there is only one

<sup>16</sup> The idea that the external argument of perfective clauses is rendered inactive in some way as a result of a defective or needy aspect head (or  $v^0$ ) that requires additional licensing is not new (e.g., Anand & Nevins 2006, Kalin 2014, 2018, a.o.). In section 4.3 I attribute a word order restriction found only with perfective clauses to the Agree relation between the perfective  $\text{Asp}^0$  and the external argument. However, given that Amis does not have overt agreement morphology, direct proof for this Agree is more elusive. I leave this for future research.

nominal, namely, the patient, that remains visible at this stage. By Rules (11b-c), the patient receives nominative case, as  $v^0$  is the highest category head in this domain. Finally, by the *One Case Constraint* in (14), the patient surfaces with nominative case and the agent with genitive case, which is the only case the agent has received throughout the derivation. This derives the case patterns found in (23).



Conceivably, gerunds may also contain a perfective  $Asp^0$ . The current proposal predicts for a perfective (di)transitive gerund, two nominals will surface with genitive case. The first is assigned to the agent in the first case assignment. The agent is later removed from case competition after the perfective  $Asp^0$  agrees with it. As a result, the next highest nominal will also receive genitive case when the second case assignment applies. Gerunds with this case pattern exist in Amis, as (25a-b) show, and their word order possibilities are consistent with we will see in section 4.3. However, speakers' judgments on these examples varied<sup>17</sup> and their aspectual properties are unclear at the moment. Therefore, I remain agnostic as to whether (25a-b) instantiate gerunds that contain a perfective  $Asp^0$ .

(25a) % *Cecay a tatokian [GERUND ko pi-tangtang no tawki no 'orang ]*.  
 one LNK hour NOM AV-cook GEN boss GEN lobster  
 'The boss' cooking the lobsters took an hour.'

(25b) % *Pa-sowal-en no tawki ko sito [GERUND to pi-pa-rakat no*  
 CAUS-word-PV GEN boss NOM student ACC AV-CAUS-walk GEN  
*ising no-ra wawa to codad ]*.  
 Doctor GEN-that child ACC book  
 'The boss told the students about the doctor's sending those children the books.'

#### 4.3 Word order restrictions in perfective main clauses

In addition to voice morphology and case patterns, AV and NAV main clauses also differ in word order possibilities for their arguments. The order of arguments in AV clauses is rather unrestricted. In transitive clauses, such as (26), the agent can either precede or follow the patient. For ditransitive clauses (data not included for reasons of space), all six word order possibilities are attested.

<sup>17</sup> This is true even for the same speaker. Gerunds with this case pattern, however, have been volunteered multiple times, in writing even, and are most likely a genuine phenomenon in Amis.

- (26) *Mi-tangtang* { *ko tawki to-ra 'orang / to-ra 'orang ko tawki*}.  
 IPFV.AV-cook NOM boss ACC-that lobster ACC-that lobster NOM boss  
 ‘The boss is cooking those lobsters.’

The order of arguments in NAV clauses is more restricted. Descriptively, the agent cannot be separated from the verb by another argument. For example, (27a) is ungrammatical when the patient precedes the agent. This restriction does not apply to nominative arguments only. (27b), a ditransitive clause, is degraded when the accusative patient precedes the agent.

- (27a) *Tangtang-en* { *no tawki ko-ra 'orang / \* ko-ra 'orang no tawki*}.  
 cook-PV GEN boss NOM-that lobster NOM-that lobster GEN boss  
 ‘The boss cooked those lobsters.’
- (27b) *Pa-feli-en* { *ni tawki ko wawa to codad / ?? to codad no tawki ko wawa*}.  
 CAUS-give-PV GEN boss NOM child ACC book ACC book GEN boss NOM child  
 ‘The boss gave the children the books.’

Moreover, this restriction differs from the linear adjacency requirement found in Malagasy (Pearson 2005) or Balinese (Erlewine et al. 2017). As (28) shows, adjuncts can precede the agent in an NAV clause.

- (28) *Tangtang-en* { *inacila / i loma' / to cecay a tatokian*} *no tawki ko-ra 'orang*.  
 cook-PV yesterday / P house / ACC one LNK hour GEN boss NOM-that lobster  
 ‘The boss cooked those lobsters yesterday / at home / for an hour.’

I propose that the word order restriction found in NAV clauses in Amis should be attributed to the Agree relation between the perfective Asp<sup>0</sup> and the agent. Specifically, the perfective Asp<sup>0</sup> agrees with the agent to value its [uφ] feature. An intervening element containing an [iφ] feature, such as another nominal argument in (27a-b), bleeds this Agree. The adjuncts in (28), however, do not bear an (accessible) [iφ] feature and therefore do not act as an intervener.

Moreover, the gerunds we saw in section 3, repeated in (29a-b), do not contain an Asp<sup>0</sup> to begin with. Therefore, we predict that the word order restriction found with NAV clauses should not apply to these gerunds. (29a-b) show that this is true. In both, regardless of voice morphology on the gerund verb, the agent can either precede or follow the patient.<sup>18</sup>

- (29a) ... *to(-ya) pi-tangtang* { *no tawki to-ra 'orang / to-ra 'orang no tawki*}.  
 ACC-(that) AV-cook GEN boss ACC-that lobster / ACC-that lobster GEN boss  
 ‘(The cats are happy about) the boss’ cooking those lobsters.’
- (29b) ... *to(-ya) tangtang-en/-an* { *no tawki to-ra 'orang / to-ra 'orang no tawki*}.  
 ACC-(that) cook-PV/LV GEN boss ACC-that lobster / ACC-that lobster GEN boss  
 ‘(The cats are happy about) the boss’ cooking those lobsters.’

Based on the data introduced so far, a potential alternative generalization of the case patterns could be this: the agent receives nominative case whenever the verb is prefixed with *m-*; otherwise, the agent receives genitive case. I discuss this alternative in Appendix A.

<sup>18</sup> I suggested above that (25) might be perfective gerunds. If this is true, then we expect that in (25), no argument can intervene between the agent and the verb. Speakers’ judgments indeed support this. However, as mentioned above, judgments on gerunds like (25), where two arguments receive genitive case, varied, and their aspectual properties are unclear at this point, so I will not try to draw any conclusion from these data.

## 5 Movement is not a prerequisite for successive-cyclic case assignment

I proposed above that in Amis, case assignment occurs each time a phase head is merged. The current proposal departs from recent proposals of successive-cyclic case assignment in one major respect. Levin (2017), for example, observes that in Korean, a nominal with case-stacking must be specific, whereas the same nominal without case-stacking is ambiguous. In (30a), the dative subject can be either specific or non-specific. In (30b), however, the subject is marked with two cases: dative and nominative, and it only has a specific interpretation. Levin (2017) assumes that movement of a nominal outside of  $\nu$ P forces a specific interpretation of the nominal. He argues that the correlation between case-stacking and obligatory specific interpretation indicates that in (30b), the outer nominative case is assigned outside of  $\nu$ P, and is stacked on top of the dative case, assigned within  $\nu$ P.<sup>19</sup> He proposes that this is a general requirement on successive-cyclic case assignment: a nominal must move into the next higher phase to undergo another case assignment.

(30a) *Etten-salam-hanthey Yenghi-ka coha.* (Levin 2017:20a)  
 some-person-DAT PN-NOM likes  
 ‘Some person likes Yenghi.’

(30b) *Etten-salam-hanthey-ka Yenghi-ka coha.* (Levin 2017:20b)  
 some-person-DAT-NOM PN-NOM likes  
 ‘Some person likes Yenghi.’

In the current proposal, however, movement is not a necessary condition for multiple case assignment. Below, I present data on Condition C and pronominal variable binding that supports this claim. In transitive NAV clauses, genitive case on the agent is assigned at the  $\nu$ P phase, whereas nominative case on the patient is assigned at the CP phase. If movement into the CP phase is necessary for the patient to receive nominative case, we expect that in NAV clauses, the patient should c-command the agent.<sup>20</sup> What we found in Amis is in fact the opposite: in NAV clauses, the agent still c-commands the patient. Moreover, this is identical to AV clauses. That is, in Amis, the case alternation between AV and NAV clauses does not correlate with different structural relationships between arguments within the same clause.

I start with Condition C. (31a-b) show that coreference between *tawki* ‘boss’ and the pronoun is possible only when *tawki* ‘boss’ is the agent. To see whether the unavailability of coreference in (31b) results from the pronoun c-commanding *tawki* ‘boss’ (a Condition C violation) or *tawki* ‘boss’ c-commanding the pronoun (a Condition B violation), we first embed the pronoun in a relative clause, as in (31c). Here, coreference becomes possible again. Next, we embed *tawki* ‘boss’ in a relative clause, as in (31d), but coreference remains impossible. (31a-d) together suggest that coreference in (31b) is ruled out because the agent c-commands the patient, even though the agent is marked with genitive case, assigned at the  $\nu$ P phase. Moreover, the AV counterpart of (31) illustrates exactly the same pattern (data omitted for reasons of space).

(31a) *Pohpoh-en no tawki cingra.* (Coreference ✓)  
 touch-PV GEN boss NOM.3SG  
 ‘The boss<sub>7</sub> touched herself<sub>7</sub>/her<sub>8</sub>.’

(31b) *Pohpoh-en ningra ko tawki.* (Coreference X)  
 touch-PV GEN.3SG NOM boss  
 ‘She\*<sub>7/8</sub> touched the boss<sub>7</sub>.’

(31c) *Pohpoh-en* [<sub>AGENT</sub> *no-ya mi-pa-kaen-an ningra a posi*] *ko tawki.*  
 touch-PV GEN-that IPFV.AV-CAUS-eat-LV GEN.3SG LNK cat NOM boss  
 ‘That cat that she<sub>7/8</sub> fed touched the boss<sub>7</sub>.’ (Coreference ✓)

<sup>19</sup> The dative subject in (30a) is ambiguous because according to Levin (2017), the outer case, assigned only when the subject moves into the CP phase, does not need to be pronounced.

<sup>20</sup> An alternative would be that both nominals move into the CP phase and maintain the same c-command relationship. The agent is not assigned another case for independent reasons. This alternative requires two movements that are not clearly motivated and do not seem to have any interpretational consequences, unlike the Korean examples in (30a-b). Without additional evidence, the current proposal is more parsimonious.



- (31d) *Pohpoh-en ningra* [<sub>PATIENT</sub> *ko-ya mi-pa-kaen-an no tawki a posi*].  
 touch-PV GEN.3SG NOM-that IPFV.AV-CAUS-eat-LV GEN boss LNK cat  
 ‘She\*<sub>7/8</sub> touched that cat that the boss<sub>7</sub> fed.’ (Coreference X)

We found the same pattern with pronominal variable binding. In (32a), the quantified agent can bind a pronoun inside the patient, whereas reversing the position of the quantified nominal and the pronoun, as in (32b), makes the bound reading unavailable. Again, the AV counterpart of (32a-b) behaves in the same way.

- (32a) *Nengneng-en no ha-cecay-ay a ina ko wawa ningra.* (Bound reading ✓)  
 watch-PV GEN DISTR-one-AY LNK mother NOM child GEN.3SG  
 ‘Every mother<sub>7</sub> looked at her<sub>7/8</sub> child.’
- (32b) *Nengneng-en ni ina ningra ko ha-cecay-ay a wawa.* (Bound reading X)  
 watch-PV GEN mother GEN.3SG NOM DISTR-one-AY LNK child  
 ‘Her/his\*<sub>7/8</sub> mother looked at every child<sub>7</sub>.’

I illustrated above that in NAV clauses in Amis, the genitive agent c-commands the nominative patient, even though genitive case is assigned at the vP phase and nominative case is assigned at the CP phase. This supports the current proposal in which movement is not necessary for multiple case assignment.<sup>21</sup>

Besides the alternative I discussed in footnote 20, another possible account of (31)-(32) is that the patient does move into the CP phase and this is how it can be assigned nominative case. In addition, the nominative patient obligatorily reconstructs and the reconstruction explains (31)-(32).

A wider-scale investigation of the scope relations in Amis is yet to be carried out. However, examples such as (33) show that the nominative patient of a PV clause can scope above or below the negation. This is shown by (33)’s compatibility with either of the two contexts listed below. I assume that negation is merged outside of vP and that wide scope over negation is derived by quantifier raising at LF. If instead, according to the alternative outlined above, the nominative patient moves but obligatorily reconstructs, the scope ambiguity in (33) is unexpected.

- (33) *Caay nengneng-en no sito ko ha-cecay-ay a codad.*  
 NEG watch-PV GEN student NOM DISTR-one-AY LNK book  
 ‘The student did not read every book.’ (NEG > every; every > NEG)

Context 1: The student was assigned a reading list for the summer. It was a really long list. He read a few books on the list but did not get to finish the entire list.

Context 2: The student was assigned a reading list for the summer, but he was lazy and did not like to read, so at the end of summer, he did not even read one single book on the list.

The alternative account in which the nominative argument moves has been proposed for related languages. For example, Richards (2000) and Pearson (2005) showed that nominative arguments in Tagalog or triggers in Malagasy are similar to V2 topics in German or Icelandic. Specifically, a fronted V2 topic that moves across a co-indexed pronoun, such as *sein* in (34a-b), creates a new binding relation. Similarly, in the Tagalog example in (34c)<sup>22</sup>, the nominative patient, though merged lower than the genitive agent, can nevertheless bind into the agent. Crucially, we saw above that, in (32b), the Amis counterpart of (34b-c), the bound reading is not available. In addition, nominative arguments in Amis can be either definite or indefinite. This differs from Tagalog, where nominative arguments must be definite (Collins 2018, a.o.). Given these differences and the scope ambiguity in (33), an alternative account in which the nominative argument moves (to receive nominative case) and then reconstructs for interpretation is not motivated for Amis.

<sup>21</sup> I assume that the verb-initial word order is derived by head movement of the verb.

<sup>22</sup> The original glosses have been modified to make comparison with Amis more transparent.

- (34a) \* *Sein Vater hat gestern jeden Studenten besucht.* (German: Pearson 2005:65a)  
 his.NOM father has yesterday every.ACC student.ACC visited  
 ‘His<sub>7</sub> father visited every student<sub>7</sub> yesterday.’
- (34b) *Jeden Studenten hat gestern sein<sub>7</sub> Vater besucht.* (German: Pearson 2005:65b)  
 every.ACC student.ACC has yesterday his.NOM father visited.  
 ‘Every student<sub>7</sub>, his<sub>7</sub> father visited yesterday.’
- (34c) ? *Minamahal ng kanyang ama ang bawat anak,* (Tagalog: Richards 2000:28b)  
 PV-love GEN his father NOM every child  
 ‘His<sub>7</sub> father loves every child<sub>7</sub>.’

## 6 Conclusion

This paper proposed an analysis of case patterns in main clauses and gerunds in Amis. I implemented the analysis in a Dependent Case model revised with two additions. First, realization of unmarked case is sensitive to the category of the case assignment domain. Second, case assignment happens once at each phase. In addition, I illustrated that Amis roots, regardless of meaning, exhibit nominal properties. As a result, the first case assignment domain in Amis is nominal. Under this analysis, genitive case on possessors and genitive case on agents of gerunds and NAV clauses have the same source. They are all at some point the highest nominal in a nominal case assignment domain. In addition, I argued that the case alternation between AV and NAV main clauses and absence of this alternation in gerunds should be attributed to the aspectual contrast between AV and NAV clauses.

## Appendix A

A potential alternative generalization of the case patterns discussed in this paper could be this: the agent receives nominative case whenever the verb is prefixed with *m-*; otherwise, the agent receives genitive case.<sup>23</sup> I give examples below that show neither part of this generalization holds, although I will not attempt to extend the proposal in this paper to account for these data.

First, neither verb in (35a-b) is prefixed with *m-*. Nevertheless, the external argument, an experiencer in both examples, receives nominative case. Second, both verbs in (36a-b) are prefixed with *m-*, but the agent receives genitive case.

- (35a) *Faedet-en ko tawki to-ra sala.*  
 hot-PV NOM boss ACC-that plate  
 ‘The boss feels that those plates are hot.’
- (35b) *Sa-pi-nengneng-an kako to-ra codad.*  
 IV-AV-watch-LV NOM.1SG ACC-that book  
 ‘I feel like reading/want to read those books.’
- (36a) *O titi ko mi-kaen-an no lokedaw.*  
 O meat NOM IPFV.AV-eat-LV GEN tiger  
 ‘Tigers eat meat.’ (lit. ‘What tigers eat is meat.’)
- (36b) *Ma-kaen (no lokedaw) ko siraw.*  
 IPFV.STA-eat GEN tiger NOM cured.meat  
 ‘The cured meat was eaten (by the tigers).’

Examples such as (36b) do pose a challenge to this paper’s proposal. I proposed that *m-* realizes imperfective aspect. In (36b), *ma-* is derived from *m-* attaching to stative *ka-*. However, (36b) and other examples where *ma-* attaches to an eventive root always entail culmination. Therefore, continuing (36b) with a clause

<sup>23</sup> Thanks to Edith Aldridge for pointing out this possibility at the AFLA24 meeting.

asserting that the cured meat has not been eaten is contradictory. This seems to be inconsistent with treating *m-* as indicating imperfective aspect. In fact, in previous works on Amis, e.g. Wu (2006), Y. Chen (2008), based on case patterns, *ma-* in examples such as (36b) is often referred to as another PV.<sup>24</sup> At the same time, *ma-* in examples such as (37), which involve cognitive or psych-predicates, is often treated as another AV. In (37), the external argument, an experiencer, receives nominative case.

- (37) *Ma-fana'/ma-keter*                                  *kako*                  *to-ra*                  *demak*.  
 IPFV.STA-know/IPFV.STA-anger    NOM.1SG    ACC-that    thing  
 ‘I know/am angry about that thing.’

The so-called PV *ma-*<sup>25</sup> differs from PV *-en* in several respects, however. First, PV *ma-* is not subject to the agentivity constraint found with PV *-en*. As (38) shows, the genitive nominal of PV *ma-* clauses can be an agent—e.g., *tawki* ‘boss’—but it can also be an inanimate causer—e.g., *fadisaw* ‘boiled water’—or even a gerund describing the cause of the event—e.g., *caay pina'on no tawki* ‘the boss’ not paying attention’. Relatedly, even with roots that do not select for an external argument, such as *tolo'* ‘trip over and fall’ in (39), a genitive nominal is still possible, and it refers to the cause of the event.

- (38) *Ma-cedet*                  (*no tawki/fadisaw/caay pi-na'on no tawki*) *ko kamay ako*.  
 IPFV.STA-burn    GEN boss/boiled.water/NEG AV-attention    GEN boss    NOM hand    GEN.1SG  
 ‘My hands were burned by the boss/boiled water/the boss’ not paying attention.’

- (39) *Ma-tolo'*                  (*no fokeloh*) *kako*.  
 IPFV.STA-fall    GEN rock    NOM.1SG  
 ‘I tripped over and fell because of the rock.’

Second, even though Amis is a *pro*-drop language, the genitive nominal of PV *ma-* clauses seems to be genuinely optional and is not just dropped when it is not pronounced. PV *ma-* clauses without a genitive nominal are complete without contextual support for *pro*-drop.

Third, in PV *ma-* clauses, a clause-internal temporal phrase marked by accusative case (e.g., *to pangkiw a tatokian* ‘half an hour’ in (40)) is ambiguous. The temporal phrase in (40) describes either the time it took the boss to finish braiding the child’s hair or the period of time for which the state resulting from the braiding event held. With PV *-en*, the resultant state reading is unavailable.

- (40) *Ma-'opir*                  *no tawki to pangkiw a tatokian ko fokes no-ra wawa*.  
 IPFV.STA-braid    GEN boss    ACC half          LNK hour          NOM hair          GEN-that child  
 Reading 1: ‘The boss braided that child’s hair in half an hour.’  
 Reading 2: ‘The boss braided that child’s hair and the hair stayed braided for half an hour.’

The discussion above suggests that PV *ma-* might be comparable to adjectival passives in languages that explicitly distinguish verbal passives from adjectival passives. Under this treatment, PV *ma-* is still stative and is in this respect not different from the so-called AV *ma-* in (37). It is also not a counterexample to the claim that *m-* realizes imperfective aspect in Amis. Nevertheless, how to derive genitive case in PV *ma-* clauses remains to be solved.

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<sup>24</sup> Both studies distinguish only Actor Voice from Undergoer Voice. The latter includes PV, LV, and IV in this paper.

<sup>25</sup> I refer to *ma-* in examples such as (36b) as PV *ma-* pre-theoretically, for easier reference. I do not commit to any analysis of *ma-* at the moment.

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# BALINESE AND OTHER *WH*-IN-SITU LANGUAGES

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## Abstract

Adverbial and nominal *wh*-phrases in Balinese show a very different distribution. While nominal *wh* must occur in situ, adverbial *wh* must undergo movement. We explore the contrasting distributions of *wh*-forms in Balinese and compare them with those found in related Austronesian languages of Java and Sumatra, and further afield, with the distribution of *wh*-forms in unrelated East Asian languages. These languages present a varied picture with regard to which *wh*-elements are available in which in-situ positions, but a generalization emerges from comparing the distributions of *wh*-forms across languages: The cross-linguistic pattern appears to fall out from a hierarchy ranging from nominal to adverbial. The current paper is primarily descriptive: We present evidence for the existence of the hierarchy and show that the facts are not predicted by current theories of *wh*-movement and *wh*-in-situ. While we are able to characterize the hierarchy descriptively, we have not, so far, been able to provide an explanation of the pattern based on current linguistic theory.

**Keywords:** Balinese, syntax, questions, typology

**ISO 639-3 codes:** ban, cmn, jax, jav, jpn, kor, mad, msa, sun, vie

## 1 Introduction

Balinese exhibits a unique distribution of *wh*-forms. Adverbial *wh*-phrases (i.e., *dija* ‘where’, *pidan* ‘when’, *kénkénange* ‘how’, and *adi* ‘why’) must be fronted (1), whereas *wh*-nominals must stay in situ (2):

(1a) *Pidan ci naar poh?*  
when you eat mango  
‘When did you eat mangoes?’

(1b) \**Ci naar poh pidan?*  
you eat mango when  
‘When did you eat mangoes?’

(2a) *Ci naar apa?*  
you eat what  
‘What did you eat?’

(2b) \**Apa ci naar?*  
what you eat  
‘What did you eat?’

The ill-formedness of postverbal *pidan* ‘when’ in (1b) contrasts with (1a), in which *pidan* occurs at the beginning of the sentence. A similar contrast is observed in the embedded setting. In (3), *pidan* ‘when’ must occur clause-initially within the clause in which it originates, whereas *apa* ‘what’ in (4) occurs only in situ.

(3a) *Madé metakon [pidan Koming naar poh].*  
Madé ask when Koming eat mango  
‘Madé asked when Koming ate mangoes.’

- (3b) \**Madé metakon [Koming naar poh pidan].*  
 Madé ask Koming eat mango when  
 ‘Madé asked when Koming ate mangoes.’
- (4a) *Madé metakon [Koming naar apa].*  
 Madé ask Koming eat what  
 ‘Madé asked what Koming ate.’
- (4b) \**Madé metakon [apa Koming naar].*  
 Madé ask what Koming eat  
 ‘Madé asked what Koming ate.’

We claim that the Balinese choice between in-situ and movement is dependent on whether *wh*-phrases are +/-N (nominal or adverbial). Languages spoken near Bali (e.g., Java) show a variety of patterns different from Balinese. When venturing further away geographically (e.g., Sumatra and Singapore) even more variation can be found in the local Malay varieties. Furthermore, examining the pattern in unrelated East Asian languages like Mandarin Chinese, the choice between which in-situ *wh*-elements can occur inside islands with matrix scope and which *wh*-elements cannot seems to show similar variation. While we are as yet unable to propose a unified theoretical account for the distributions that occur, especially when taking into account a wider range of in-situ languages, including Traditional Jambi Malay and Singaporean Malay, the distribution in all the languages examined appears to be subject to a hierarchy, which, as we shall show below, appears not to be derivable from current theories of *wh*-in-situ.

## 2 The Behavior of *Wh*-elements in Balinese

Balinese shows a sharp contrast in distribution between nominal and adverbial *wh*-phrases. Nominal *nyén* ‘who’ and *apa* ‘what’ must stay in situ; they pattern with their non-interrogative counterparts.

- (5a) (\**Nyén*) *poh-é daare ajak \*(nyén)*  
 who mango-DEF eat.PASS by who  
 ‘By who was the mango eaten?’
- (5b) (\**Koming*) *poh-é daare ajak \*(Koming).*  
 Koming mango-DEF eat.PASS by Koming  
 ‘The mango was eaten by Koming.’
- (6a) (\**Apa*) *Koming maca \*(apa)?*  
 what Koming read what  
 ‘What did Koming read?’
- (6b) (\**Buku*) *Koming maca \*(buku).*  
 book Koming read book  
 ‘Koming read a book.’

In contrast, adverbial *wh*-phrases in Balinese (i.e., *dija* ‘where’, *pidan* ‘when’, *kénkénange* ‘how’ and *adi* ‘why’) must be fronted. The questions become ungrammatical when these adverbial *wh*-forms occur in situ, as in the (a) sentences of (7)-(10). This is in contrast to non-*wh* adverbials, the distribution of which is relatively free, as shown in the (b) sentences of (7)-(10).

- (7a) (\**Dija*) *Madé naar bé-é \*(dija)?*  
 where Madé eat fish-DEF where  
 ‘Where did Madé eat the fish?’
- (7b) (*Jumah*) *Madé naar bé-é (jumah).*  
 at.home Madé eat fish-DEF at.home  
 ‘Madé ate the fish at home.’

- (8a) *\*(Pidan) Madé naar poh (\*pidan)?*  
when Madé eat mango when  
'When did Madé eat mangoes?'
- (8b) *(Dibi) Madé naar poh (dibi).*  
yesterday Madé eat mango yesterday  
'Madé ate the fish yesterday.'
- (9a) *\*(Kénkénange) Koming naar poh (\*kénkénange)?*  
how Koming eat mango how  
'How did Koming eat mangoes?'
- (9b) *(Adéng-adéng) Koming naar poh (adéng-adéng).*  
slowly Koming eat mango slowly  
'Madé ate mangoes slowly.'
- (10a) *\*(Adi) Koming lega (\*adi)?*  
why Koming happy why  
'Why was Koming happy?'
- (10b) *(Ulian Madé ngoyong jumah) Koming lega (ulian Madé ngoyong jumah).*  
because Madé stay at.home Koming happy because Madé stay at.home  
'Koming was happy because Madé stayed at home.'

The pattern shown by *nyén* 'who' and *apa* 'what' is clearly that of *wh*-in-situ, and it is distinguished from the pattern shown by adverbial *dija* 'where', *pidan* 'when', *kénkénange* 'how', and *adi* 'why'. We claim the latter to be instantiations of 'wh-movement' because movement to scopal position is obligatory for adverbial *wh*-forms but not for non-interrogative forms or for nominal *wh*-forms, as is shown in the (b) sentences of (7)-(10). To summarize:

- (11) +N *wh*-elements must be in situ and –N *wh*-elements must be fronted in Balinese.<sup>1</sup>

The representation of Balinese *wh*-questions is as follows:

- (12a) [CP<sub>[+WH]</sub> ... [ ... wh<sub>[+N]</sub> ... ]]

- (12b) [CP<sub>[+WH]</sub> wh<sub>[–N]i</sub> ... [ ... t<sub>i</sub> ... ]]

(12a) makes the claim that there exists a relationship between a scopal C<sub>[+WH]</sub> head and a +N *wh*-element which can be (indefinitely) far away. This is shown (13a) and (13b).

- (13a) *Polisi-é inget [Koming naar apa]?*  
policeman-DEF remember Koming eat what  
'What did the policeman remember Koming ate?'

- (13b) *Koming ngorahang [apa daare ajak ia]?<sup>2</sup>*  
Koming say what eat.PASS by 3sg  
'What did Koming say was eaten by him?'

<sup>1</sup> It is often difficult to distinguish whether a given requirement refers to grammatical category like [+/- N] rather than a semantic category like referentiality. In the case of Balinese, it would be difficult to characterize the distinction as referentiality because both e.g. 'who' and 'where' pick out specific individual entities. We will discuss how the appropriate distinction is to be characterized in greater detail after we have introduced the pattern found in other *wh*-in-situ languages.

<sup>2</sup> Balinese allows *wh*-phases to occur in the subject position regardless of their D-linking.

(12b) reflects the fact that –N *wh*-phrases must move to a scopal position. This accounts for why the sentences in (14) are ungrammatical.

- (14a) \**Polisi-é inget [Koming naar poh pidan ]?*  
 policeman-DEF remember Koming eat mango when  
 Intended: ‘When<sub>i</sub> did the policeman remember Koming ate mangoes t<sub>i</sub>?’
- (14b) \**Polisi-é inget [Koming naar poh kénkénange]?*  
 policeman-DEF remember Koming eat mango how  
 Intended: ‘How<sub>i</sub> did the policeman remember Koming ate mangoes t<sub>i</sub>?’
- (14c) \**Polisi-é inget [Koming naar poh adi ]?*  
 policeman-DEF remember Koming eat mango why  
 Intended: ‘Why<sub>i</sub> did the policeman remember Koming ate mangoes t<sub>i</sub>?’

However, the ungrammaticality of the sentences in (15) is not predicted so far by the observations in (11)-(12). As shown in sentences (15a-c), –N *wh*-phrases that originate within embedded clauses cannot undergo long distance movement.

- (15a) \**Pidan polisi-é inget [Koming naar poh \_\_\_]?*  
 when policeman-DEF remember Koming eat mango  
 Intended: ‘When<sub>i</sub> did the policeman remember Koming ate mangoes t<sub>i</sub>?’
- (15b) \**Kénkénange polisi-é inget [Koming naar poh \_\_\_]?*  
 how policeman-DEF remember Koming eat mango  
 Intended: ‘How<sub>i</sub> did the policeman remember Koming ate mangoes t<sub>i</sub>?’
- (15c) \**Adi polisi-é inget [Koming naar poh \_\_\_]?*  
 why policeman-DEF remember Koming eat mango  
 Intended: ‘Why<sub>i</sub> did the policeman remember Koming ate mangoes t<sub>i</sub>?’

The issue then is: Why are –N *wh*-elements not only ungrammatical in situ but they also do not seem to permit interclausal movement? The (a) sentences in (16)-(18) show that they cannot occur within syntactic islands, and the (b) sentences in (16)-(18) show that they cannot be extracted from islands overtly:

- (16a) \**Miong-é [né [pidan<sub>i</sub> [naar bé-é t<sub>i</sub>]] melaib?*  
 cat-DEF COMP when eat fish-DEF run  
 Intended: ‘When<sub>i</sub> did the cat [that ate the fish t<sub>i</sub>] run?’
- (16b) \**Pidan<sub>i</sub> miong-é [né [naar bé-é t<sub>i</sub>]] melaib?*  
 when cat-DEF COMP eat fish-DEF run  
 Intended: ‘When<sub>i</sub> did the cat [that ate the fish t<sub>i</sub>] run?’
- (17a) \**Koming gedeg [ulian pidan<sub>i</sub> [Putu maling poh t<sub>i</sub>]]?*  
 Koming angry because when Putu steal mango  
 Intended: ‘When<sub>i</sub> was Koming angry [because Putu stole mangoes t<sub>i</sub>]?’
- (17b) \**Pidan<sub>i</sub> Koming gedeg [ulian Putu maling poh t<sub>i</sub> ]?*  
 when Koming angry because Putu steal mango  
 Intended: ‘When<sub>i</sub> was Koming angry [because Putu stole mangoes t<sub>i</sub>]?’
- (18a) \**Koming naar poh [dibi lan pidan]?*  
 Koming eat mango yesterday and when  
 Intended: ‘Yesterday and when did Koming eat mangoes?’



- (18b) \**Pidan<sub>i</sub> Koming naar poh [dibi lan t<sub>i</sub>]?  
 when Koming eat mango yesterday and  
 Intended: ‘Yesterday and when did Koming eat mangoes?’*

There is no way to express directly matrix scope for an adverbial *wh* that originates in any embedded clause. This suggests the need for an additional constraint over and above those posited earlier.

- (19a) +N (nominal) *wh*-elements in Balinese must stay in situ and can be interpreted as taking scope over the other part of *wh*-questions.  
 (19b) –N (adverbial) *wh*-elements in Balinese must be fronted to indicate their scope but the movement cannot cross a clausal boundary.

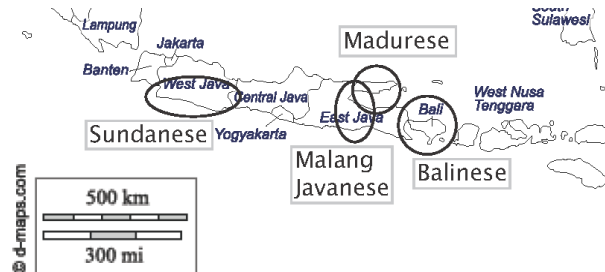
Constraint (19b) is, in fact, familiar from the work of Davies (2003, 2010) as “Extreme Locality”, a principle first proposed for Madurese that states that in Madurese movement cannot cross a clause boundary. Constraints (19a-b) claim that +N (nominal) *wh*-phrases are interpreted via a process of in situ interpretation (instantiated, perhaps, by Unselective Binding (Pesetsky 1987) or by Choice Functions (Reinhart 1998)). In contrast, –N (adverbial) *wh* cannot be interpreted in this way and the movement is overt to Spec of CP, the head of the chain is pronounced rather than the tail, and the movement is “extremely” local.

### 3 Expanding to *Wh*-questions in Neighboring Languages

Is the same pattern found in other neighboring languages that look superficially similar to Balinese?

We shall now broaden our domain of inquiry to *wh*-phrases in three of the languages spoken on the nearby island of Java: Madurese, Javanese (represented by Malang Javanese in our work), and Sundanese. To what extent do these structurally similar neighboring languages show the same pattern as Balinese?

**Figure 1:** *Distribution of Sundanese, Madurese, Malang Javanese, and Balinese speakers*



#### 3.1 Nominal *Wh*-phrases in Madurese, Malang Javanese, and Sundanese

Nominal (+N) *wh*-phrases in Madurese, Malang Javanese, and Sundanese exhibit the same general pattern as in Balinese. The expressions referring to ‘who’ and ‘what’ must occur in the place where their non-interrogative counterparts would occur. The expressions used for ‘where’ (i.e., *endi* in Javanese, *mana* in Sundanese, and *dhimma* in Madurese) appear to be nominal as well in that they require a preposition *edik/di/e* ‘in’. These occur in situ as well. (20), (21), and (22) respectively contain data in Malang Javanese, Sundanese, and Madurese.

- (20a) *Pande mangan apa?* Malang Javanese  
 Pande eat what  
 ‘What is Pande eating?’
- (20b) *Sapa maca buku iki?* Malang Javanese  
 who read book this  
 ‘Who read this book?’

- (20c) *Pande mlayu ndik endi?*  
Pande run in where  
'Where did Pande run?'  
Malang Javanese
- (21a) *Amir meuli naon?*  
Amir buy what  
'What did Amir buy?'  
(Gumir 2009: (1))  
Sundanese
- (21b) *Amir nepungan saha?*  
Amir meet who  
'Who did Amir meet?'  
(Gumir 2009: (2))  
Sundanese
- (21c) *Amir indit ka mana?*  
Amir go to which  
'Where did Amir go to?'  
(Gumilar 2009: (3))  
Sundanese
- (22a) *Ali e-pokol sapa?*  
Ali OV-hit who  
'Who hit Ali?'  
(Davies 2010: p. 447, (35a))  
Madurese
- (22b) *Bapa' ngerem apa dha' Bibbi?*  
father AV.send what to aunt  
'What did father send to auntie?'  
(Davies 2010: p. 445, (26a))  
Madurese
- (22c) *Siti nyaba' buku e dhimma?*  
Siti AV.put book at where  
'Where did Siti put the book?'  
(Davies 2010: p. 446, (29b))  
Madurese

### 3.2 Adverbial Wh-phrases in Madurese, Malang Javanese, and Sundanese

In contrast to Balinese, the expressions for 'when' and 'how' in Madurese, Malang Javanese, and Sundanese occur both in situ and sentence initially. *Lahopo* 'why' in Malang Javanese (25) and *naha* 'why' in Sundanese (28) can only occur sentence initially and cannot occur in situ, whereas Madurese *arapa* 'why' is possible in situ, as in (31).

- (23) *(Kapan) awakmu masak (kapan)?*  
when you cook when  
'When did you cook?'  
Malang Javanese
- (24) *(Yaopo) awakmu masak pitik-e (yaopo)?*  
how you cook chicken-DEF how  
'How did you cook the chicken?'  
Malang Javanese
- (25) *(Lahopo) awakmu masak (\*lahopo)?*  
why you cook why  
'Why did you cook?'  
Malang Javanese
- (26) *(Iraha) Hasan rék datang (iraha)?*  
when Hasan will come when  
'When will Hasan come?'  
(Davies and Kurniawan 2013: (70a,b))  
Sundanese
- (27) *Manuk disadana kumaha?*  
Bird sounds how?  
'How does the bird sound?'  
(Gumilar 2009: (5))  
Sundanese

- (28) *(Naha) Amir meuli buku (\*naha)?* Sundanese  
 Amir buy book why  
 ‘Why did Amir buy books?’ (Gumilar 2009: (16),(11))
- (29) *(Bila) ana'-na Lukman entar ka Sorbaja, (bila)?* Madurese  
 when child-DEF Lukman go to Surabaya when  
 ‘When did Lukman’s child go to Surabaya?’ (Davies 2010: pp. 449-50, (43b),(44b))
- (30) *(Dha'ramma) Ali ma-tepp a' komputer, (dha'ramma)?* Madurese  
 how Ali AV.CS-right computer how  
 ‘How did Ali fix the computer?’ (Davies 2010: pp. 449-50, (43c),(44c))
- (31) *(Arapa) Ita ma' mole, (arapa)?* Madurese  
 why Ita EMPH go.home why  
 ‘Why did Ita go home?’ (Davies 2010: pp. 449-50, (43a),(44a))

It appears, then, that Balinese has a more constrained system than the neighboring languages: In Balinese, all nominal *wh*-phrases must stay in situ while all adverbial *wh*-phrases must move locally.

When we examine adverbial *wh*-phrases that originate inside complement clauses, a further difference emerges in terms of locality conditions. The Madurese examples in (32) show adverbial *wh*-phrases that appear in clause initial position in a complement clause and have matrix scope.

- (32a) *Wati ngera dha'ramma Ali ma-becce' komputer-ra?* Madurese  
 Wati AV.think how Ali AV.CS-good computer-DEF  
 ‘How<sub>i</sub> does Wati think that Ali fixed the computer t<sub>i</sub>?’ (Davies 2010: p. 455 (71))
- (32b) *Ina yaken bila Rokip mangkad-a ka Jakarta?* Madurese  
 Ina sure when Rokip leave-IRR to Jakarta  
 ‘When<sub>i</sub> is Ina sure Rokip will leave for Jakarta t<sub>i</sub>?’ (Davies 2010: p. 455 (72))

In contrast, Balinese adverbial *wh*-phrases can only take scope over the clause in which they occur, as shown in (33):

- (33a) *\*Polisi-é inget [pidan Koming<sub>i</sub> naar poh t<sub>i</sub>]?*  
 policeman-DEF remember when Koming eat mango  
 Intended: ‘When<sub>i</sub> did the policeman remember Koming ate mangoes t<sub>i</sub>?’
- (33b) *\*Polisi-é inget [kénkénange<sub>i</sub> Koming naar poh t<sub>i</sub>]?*  
 policeman-DEF remember how Koming eat mango  
 Intended: ‘How<sub>i</sub> did the policeman remember Koming ate mangoes t<sub>i</sub>?’
- (33c) *\*Polisi-é inget [adi<sub>i</sub> Koming naar poh t<sub>i</sub>]?*  
 policeman-DEF remember why Koming eat mango  
 Intended: ‘Why<sub>i</sub> did the policeman remember Koming ate mangoes t<sub>i</sub>?’

We conclude that in Balinese the locality condition is even more extreme than in Madurese. Not only does it affect all adverbial *wh*-questions, but it also affects abstract movement or the equivalent in current theory, the ability to link the scopal position with a *wh*-word moved to an intermediate Spec of CP.<sup>3</sup>

<sup>3</sup> We suspect that this difference between Balinese and Madurese may constitute an argument for the claim that in Madurese (but not in Balinese) adverbial *wh*-phrases are generated in an adjoined sentence-initial position rather than moved to Spec CP, and are hence interpretable via Unselective Binding.

### 3.3 Interim Summary

Sections 3.1 and 3.2 showed that while the characteristics of Balinese nominal *wh*-phrases carry over to nominal *wh*-phrases of Madurese, Malang Javanese and Sundanese, the behavior of Balinese adverbial *wh*-phrases is different from that of adverbial *wh*-phrases in Madurese, Malang Javanese, and Sundanese. This is summarized in Table 1:

**Table 1:** *Variation in the distribution of in-situ wh-elements*

Category	In situ 'what'/'who'	In situ 'where'	In situ 'when'	In situ 'how'	In situ 'why'	Reference
Balinese	OK	X	X	X	X	Elicitation
Malang Javanese	OK	OK	OK	OK	X	Elicitation
Sundanese	OK	OK	OK	OK	X	Gumilar 2009
Madurese	OK	OK	OK	OK	OK	Davies 2010

How can we account for this distribution theoretically? There are two widely used mechanisms for in-situ interpretation of *wh*: Choice Functions (Reinhart 1982) and Unselective Binding (Pesetsky 1987). Choice Functions (CF) are claimed by Reinhart to only apply to referential entities while non-referential adverbials cannot be interpreted this way. But 'where' and 'when' refer to locations and times and should be interpretable in situ (bound by the Choice Function, CF-operator). Thus, applying Reinhart's version of CF to predict this dichotomy will not work for Balinese.

Unselective Binding (UB), on the other hand, could in principle bind any *wh*-indefinite but again would not explain the Balinese dichotomy. It may predict the facts for Madurese, because any *wh* can be in situ. Thus, UB seems to have no predictive power to explain the distribution found in any language in which certain *wh*-phrases are interpreted in situ while others are forced to move. Choice Functions force a division, but only between 'how' and 'why' and the rest. None of the languages we have discussed so far show that division.

For Balinese, the correct generalization seems to be a distinction in morpho-syntactic category (if we assume that 'where' and 'when' are morpho-syntactically adverbial in Balinese): Nominal (+N) *wh* stays in situ while Adverbial (–N) *wh* must move. The nominal versus adverbial distinction does not generalize to other languages we discuss: it cannot explain the distribution of the other languages we surveyed, nor does it explain the differences in degree of locality seen in Madurese/Sundanese versus Balinese. (We do not have similar information on Javanese.) There is a tendency across languages not to allow 'why'-adverbials in situ, but it is merely a tendency, since Madurese allows in-situ 'why'. There is, however, an implicational hierarchy observed: If a language allows 'why'-adverbials in situ, then it allows all other adverbial and nominal *wh*-phrases in situ. The hierarchy can be expressed as follows:

- (34) *Wh*-Hierarchy:  
 Nominal *wh* > where/when/how > why

It is not obvious what theoretical machinery can explain this hierarchy, a topic to which we shall return below.

## 4 Venturing Further Away Geographically

Jambi Malay dialects in Sumatra and Singaporean Malay offer additional variation. In Traditional Jambi Malay (Tanjung Raden Malay), all *wh*-phrases can stay in situ including the –N adverbials 'how' and 'why' (Yanti 2010). In Educated Singaporean Malay, 'how' and 'why' move obligatorily, while the other *wh*-words can remain in situ (Cole and Hermon 1998).

Figure 2: Distribution of Educated Singaporean Malay and Traditional Jambi Malay



Table 2: Additional variation in the distribution of in-situ wh-elements

Category	In situ ‘what’/‘who’	In situ ‘where’	In situ ‘when’	In situ ‘how’	In situ ‘why’	Reference
Traditional Jambi Malay (TJM)	OK	OK	OK	OK	OK	Yanti (2010)
Educated Singaporean Malay (ESM)	OK	OK	OK	X	X	Cole and Hermon (1998)

While the distribution in TJM is similar to that found in Madurese, ESM adds a new dimension. This is the first example we have seen of a language in which the division between the forms that must be moved and those that must remain in situ groups ‘how’ and ‘why’ together. This would naturally fall out if *wh*-in-situ is licensed by Reinhart’s version of CF, but it would not fall out from UB.

To summarize, even if we allow each language to be governed by one or more of the principles listed in the Table 3, not all the variation can be explained:

Table 3: Principles explaining the variation in the distribution of in-situ wh-elements

Category	In situ ‘what’/‘who’	In situ ‘where’	In situ ‘when’	In situ ‘how’	In situ ‘why’	Principles
Balinese	OK	X	X	X	X	Grammatical category (+/-N)
ESM	OK	OK	OK	X	X	Choice Functions
Malang Javanese	OK	OK	OK	OK	X	???
Sundanese	OK	OK	OK	OK	X	???
Madurese	OK	OK	OK	OK	OK	Unselective Binding
TJM	OK	OK	OK	OK	OK	Unselective Binding

Even just examining a few fairly closely related languages, and even with multiple principles, we have seen distributions which cannot be accounted for. However, there is a robust generalization in terms of a hierarchy:

- (35) *Wh*-Hierarchy (refined from (34)):  
 Nominal *wh* > where/when > how > why

All languages fall at some point on the hierarchy and, for instance, there is no language that groups ‘what’ together with ‘how’ to the exclusion of ‘where’ and ‘when’.

## 5 Islandhood in East Asian Languages

The hierarchy observed in (35) appears to also have explanatory power with regard to the distribution of *wh*-in-situ languages spoken in other parts of Asia. Unlike the Austronesian languages discussed in sections 3 and 4, East Asian languages do not vary in terms of the overt fronting of *wh*-expressions since these languages require all *wh*-phrases to be pronounced in situ; however, a similar pattern of contrasts is observed with respect to the sensitivity of *wh*-forms to syntactic islands. Table 4 provides a general sketch of whether *wh*-elements can appear within syntactic islands. The inability of a *wh*-form to occur in a syntactic island is generally taken in the literature to indicate that this form undergoes obligatory movement that is blocked by the island. The languages are consistent in allowing nominal +N *wh*-phrases in situ in addition to ‘where/ when’ and prohibiting ‘why’ within islands. Languages vary as to whether they allow ‘how (method)’ and ‘how (manner)’ within islands. Subtle differences in the variations make it challenging to come up with principles covering the patterns.

**Table 4:** *Grammaticality of in-situ wh-phrases within syntactic islands*

Category	Nominal <i>Wh</i>	‘how’ (method)	‘how’ (manner)	‘why’ (reason)	Reference	Principles
Mandarin Chinese	OK	OK	X	X	D. Tsai 1994, Huang 1982	Categorial (Huang 1982)
Japanese/Korean	OK	OK	OK	X	Fujii and Takita 2007	UB, with constraint on ‘why’
Vietnamese	OK(*?)	OK(*?)	OK(*?)	X	C. Tsai 2009, (Bruening and Tran 2006 <sup>4</sup> )	UB, with constraint on ‘why’
Traditional Jambi Malay (TJM)	OK	OK	OK	OK	Yanti 2010	Unselective Binding

One approach is to account for the variation by differentiating between clausal adverbials and lower level adverbials (Tsai 1999). This approach claims that ‘why’ modifies the entire clause and hence cannot fit within islands. Other researchers have viewed the asymmetry in the behavior of *wh*-elements in a specific language in terms of categorial difference: adverbial *wh*-phrases are island-sensitive but nominal *wh*-phrases are not (Huang 1982, Murasugi and Saito 1992). The latter view is similar to our account for Balinese *wh*-elements but note that in our view of Balinese ‘where’ and ‘when’ are assumed to be adverbial.

Just like the variation in Tables 3, it is difficult to explain the cross-linguistic variation illustrated in Table 4 by appealing to any single principle. While Choice Functions and Grammatical Category seem to make similar correct predictions for Chinese (but not for Korean or Vietnamese), when we consider islandhood facts in Jambi Malay and Singaporean Malay, it is clear that no single mechanism can account for the patterns in all these languages.

The distributional constraints on which *wh*-elements can occur inside an island and which *wh*-elements can occur in situ seem to be similar. It is not immediately apparent what general principle these distributions follow from. The hierarchy for *wh*-phrases within syntactic islands can be stated as follows:

- (36) Hierarchy of In-situ *Wh*-questions inside islands:  
Nominal *wh*/where /when > how > why

This is in fact nearly identical to the *wh*-hierarchy for in-situ *wh* which we discussed earlier. There is only one exception: ‘Where’ and ‘when’ seem to always be possible inside an island in Chinese, while in some Indonesian languages, like Balinese, they cannot occur in situ.

<sup>4</sup> Bruening and Tran (2006) reported that nominal *wh*-phrases such as ‘who’ in Vietnamese are ungrammatical within islands without an overt particle in a scopal position.

## 6 Conclusion

We have illustrated the fact that Balinese presents an example of a language that limits in-situ *wh* to what can be characterized as +N expressions. We saw that Balinese also observes strict locality. However, different options regarding which *wh*-elements can occur in situ are observed in other languages across Indonesia. In a similar fashion, consistently in-situ languages such as Mandarin Chinese and Korean allow a variety of different options for which *wh*-phrases can occur within islands. It does not seem possible to explain these similar distributions by any single principle that has been proposed in the literature. However, all the distributional patterns discussed conform to an implicational hierarchy with +N on one end and ‘why’-expressions on the other end. This suggests that the pattern observed is a unified phenomenon; however, it is one that we have not yet succeeded in explaining fully.

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# THE TEMPORAL INTERPRETATION OF COMPLEMENT AND RELATIVE CLAUSES: CONTRASTING ENGLISH AND SAMOAN

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## Abstract

Based on data from original fieldwork, this paper investigates the temporal interpretation of two subordinate constructions in Samoan, an aspect-prominent language. We show that both relative and complement clauses are interpreted as temporally dependent on the matrix sentence. Embedding a past perfective under a past perfective always yields a backward shifted interpretation, while embedding an imperfective yields a simultaneous interpretation. We derive this pattern by positing lambda abstraction over a temporal proform in the embedded constituent, which in the case of the past perfective is its presupposition.

**Keywords:** Semantics, tense, aspect, subordination, presupposition binding

**ISO 639-3 codes:** smo, eng, jpn

## 1 Introduction and background

### *1.1 The temporal interpretation of subordinate constructions*

The temporal interpretation of subordinate constructions across languages is a very active area of research in semantics (see, e.g., Kusumoto 1999, Hataw 2012, and Ogihara and Sharvit 2012 for overviews and further references) and is generally considered a touchstone for the adequacy of any theory of tense and aspect (von Stechow 2009). So far, however, the majority of the research on the topic has focused on languages like English, which morphologically encode tense (but see Mucha 2015; Bochnak 2016; Mucha and Fominyam 2017). In this paper, we offer an overview of the temporal interpretation of two types of subordinate constructions in Samoan, an aspect-prominent Polynesian language, together with a compositional semantic analysis. The interpretative pattern that we find is uniform across constructions: Simultaneous readings require an embedded imperfective aspect, while backward shifted readings only arise with the embedded past perfective. We derive this pattern by lambda abstraction over a temporal proform in the embedded constituent.

The structure of the paper is as follows: The next subsection provides a concise introduction to the temporal interpretation of relative and complement clauses in English, along with a standard analysis. Against this background, section 2 provides the view from Samoan: Subsection 2.1 sets up the basic architecture of tense and aspect in the language. Subsection 2.2 discusses the interpretative possibilities of complement and relative clauses. These data are then analysed in section 3. Section 4 concludes with a discussion of the structural and lexical differences between English and Samoan that lead to the observed variation, and with some remarks regarding the broader cross-linguistic picture.

### *1.2 The view from English*

In English, a past tense embedded under a past tense in a complement clause like (1) may have two readings, a backward shifted and a simultaneous reading. Under the same configuration, relative clauses also allow for those two types of readings, as shown in (2). They do however additionally license a forward-shifted interpretation, illustrated in (3). We are thus confronted with “. . . the puzzling fact that most, but not all, occurrences of past tense convey a meaning of anteriority” (Heim 1994, p. 143).



- (1) *Susan said [that Mary was pregnant].*  
 Susan said: ‘Mary was pregnant.’ (BACKWARD SHIFTED, BACKWARD)  
 Susan said: ‘Mary is pregnant.’ (SIMULTANEOUS, SIM)
- (2) *Susan talked to a boy [who was crying].*  
 ‘The running time of the boy crying precedes the running time of Susan talking to him.’ (BACKWARD)  
 ‘The running time of the event of Susan talking to the boy overlaps with his crying.’ (SIM)
- (3a) *Hillary married a man [who became President of the United States].*  
 ‘Hillary’s marriage pre-dates her husband’s inauguration.’ (LATER-THAN-MATRIX, LATER)  
 (Kusumoto 1999, p. 14, no. (12a))
- (3b) *Who hired the person [who wrote this article]?*  
 ‘The girl was hired before the time of writing.’ (LATER)  
 (Kusumoto 1999, p. 14, no. (12b))

Note that the availability of these readings in English interacts with eventuality type: In complement clauses, embedded stative predicates generally allow for simultaneous readings. For eventive predicates, however, the simultaneous interpretation is easily available only with the progressive, as is illustrated in (4). This observation goes back to Enç (1987) and Ogihara (1989).

- (4a) *Susan said [that Peter was crying].* (BACKWARD, SIM)  
 (4b) *Susan said [that Peter cried].* (BACKWARD only)

Kusumoto (1999, pp. 78-80) provides the counterexample in (5), attributed to Barbara Partee, which readily allows for the simultaneous interpretation. Relative clauses appear not to be subject to these restrictions, as is evident from the examples in (3) above.

- (5) (I thought the glass fell by itself.) *I didn’t know [that you pushed it].*

While we will not pursue an analysis of the interaction between eventuality type and the availability of the different interpretations in English here, these observations serve as a reminder to be aware of the eventuality type of the embedded predicate when investigating the temporal interpretation of subordinate constructions.

How can we account for these different readings then? Under structural approaches (Ogihara 1989, 1995, 1996; Abusch 1997; Kratzer 1998; Kusumoto 1999, 2005; Stowell 2007; von Stechow 2009; Grønn and von Stechow 2010), the different readings of past-under-past in attitude complements derive from two distinct Logical Forms.<sup>1</sup> (The readings available for past-under-past in relative clauses, however, do not, as we will see in a moment.) I present below an implementation of such a structural approach for which I adopt a quantificational analysis of tense (but see Partee 1973 and Kratzer 1998), in addition to a standard analysis of aspectual meaning (e.g., Krifka 1989, Klein 1994, Kratzer 1998). For reasons of simplicity, we assume here that the English progressive encodes the imperfective (but see, e.g., Dowty 1977, 1979, and refinements thereof).

A simple matrix sentence like (6) will then, somewhat informally, require that there is a contextually salient time before the utterance time (= the contribution of past tense) at which Peter was crying. The running time of the crying event must include this reference time (= the contribution of the imperfective aspect). The denotations of the temporal and aspectual operators that derive this interpretation are in (7). The Logical Form for the sentence is in (8); we assume that the utterance time is syntactically represented in the topmost layer of the clause.

<sup>1</sup> Altshuler and Schwarzschild (2013) and Altshuler (2016) question in how far SIM and BACKWARD are really truth-conditionally distinct readings that derive from two LFs, and propose a pragmatic approach to sequence of tense.

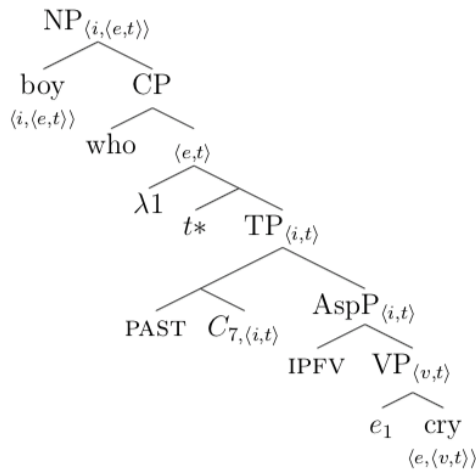


- (13) Past-under-Past Deletion Rule:  
 A past tense operator  $\alpha$  may be deleted if and only if  
 $\alpha$  is locally  $c$ -commanded by another past tense operator  $\beta$ .

Under a somewhat refined view of the syntax-morphology interface (where the past morphology that we see on the verb is distinct from the PAST-operator that sits in the LF structure), generating this LF structure can however also be thought of as the result of some licensing mechanism (Stowell 2007; Kusumoto 1999, 2005). In the case of the simultaneous reading, the PAST-operator upstairs licenses the tense morphology both on the matrix verb and on the embedded verb. Kratzer (1998) suggests thinking of this relationship in terms of agreement.

Whatever the technical implementation, this mechanism must not apply in relative clauses. I follow Kusumoto (1999, 2005)’s analysis here, under which the three different temporal readings that relative clauses allow for (i.e., the backward shifted, the simultaneous, and the later-than-matrix interpretation) are a result of under-specification. More specifically, unlike in complement clauses, the tense variable that the embedded PAST-operator combines with is stipulated to be the utterance time, which is syntactically represented in the CP-layer of the clause, as in (14a).<sup>2</sup> The noun phrase then receives the interpretation in (14b), which requires that the run time of the crying event be contained with a time which is prior to the utterance time.

- (14a) Logical Form for relative clause:



- (14b)  $\llbracket \text{NP} \rrbracket = \lambda t. \lambda x. x \text{ is a boy at } t \ \& \ \exists t' [C(t') = 1 \ \& \ t' < t^* \ \& \ \exists e [\tau(e) \supset t' \ \& \ e \text{ is an event of } x \text{ crying}]]$

The truth conditions we derive for the sentence are in (15). Both the matrix and the embedded past are interpreted relative to the utterance time  $t^*$ . The truth conditions do thus however not specify an ordering between the matrix reference times  $t''$  and the relative clause reference time  $t'$ .

- (15) Truth conditions for past-under-past in relative clauses:  
 $\llbracket (2) \rrbracket = 1$  iff  $\exists t'' [C'(t'') = 1 \ \& \ t'' < t^* \ \& \ \exists x [x \text{ is a boy at } t''] \ \& \ \exists t' [C(t') = 1 \ \& \ t' < t^* \ \& \ \exists e [\tau(e) \supset t' \ \& \ e \text{ is an event of } x \text{ crying}]] \ \& \ \exists e' [\tau(e') \supset t'' \ \& \ e' \text{ is an event of Mary talking to } x]]$  (independent)

Under this analysis for English, relative clauses are thus temporally independent of their matrix clause. As a result, all three temporal readings are possible (BACKWARD, SIM, LATER).

To sum up this concise introduction to the temporal interpretation of past-under-past in complement and relative clauses in English: In complement clauses, this configuration allows for SIM and BACKWARD. (Certain

<sup>2</sup> Here, the noun combines with the relative clause via Extended Predicate Modification #1: If  $\alpha$  is a branching node and  $\beta$  and  $\gamma$  its daughters,  $\llbracket \beta \rrbracket \in D_{\langle i, \langle e, t \rangle \rangle}$  and  $\llbracket \gamma \rrbracket \in D_{\langle e, t \rangle}$ , then  $\llbracket \alpha \rrbracket = \lambda t. \lambda x. \llbracket \beta \rrbracket(t)(x) = 1 \ \& \ \llbracket \gamma \rrbracket(x) = 1$ .

restrictions pertaining to eventuality type apply.) In relative clauses, this configuration additionally may license LATER-THAN-MATRIX. This pattern is summarized in Table 1.

**Table 1:** *The temporal interpretation of past-under-past in complement and relative clauses in English*

	complement clauses	relative clauses
SIMULTANEOUS	✓	✓
BACKWARD SHIFTED	✓	✓
LATER-THAN-MATRIX	#	✓

While the available readings are the result of a structural ambiguity under attitude complements, they arise from under-specification in the case of relative clauses, which—by means of an utterance time variable in the relative clause—is analysed as temporally independent of the superordinate structure. Temporally dependent readings are thus restricted to complement clauses (that is, to intensional contexts), a core hypothesis of Kusumoto (1999). So, how does Samoan compare to English when it comes to the temporal interpretation of these constructions and the composition behind them?

## 2 The view from Samoan

### 2.1 Background

Samoan is a Polynesian language with approximately 300,000 speakers worldwide, the majority of whom live on the Pacific islands that constitute American Samoa and the Independent State of Samoa.<sup>3</sup> Basic word order is VSO. Tense and aspect are encoded in pre-verbal free functional morphemes (see also Marsack 1975, Hunkin 1992, Mosel and Hovdhaugen 1992, Mosel 2000, Hohaus 2017). In a restricted number of environments, these markers are optional (see Mosel and Hovdhaugen 1992, pp. 371-374). Apart from generic *e*, prospective *'o le 'ā* and inchoative *'ua*, the inventory of temporal-aspectual markers (TAM) comprises the past perfective *na* and *sā*<sup>4</sup>, and the imperfective *'o lo 'o*. The evaluation time of an imperfective may be in the present, the past or the future, as shown in (16)–(18). (In this respect, the imperfective patterns with the inchoative; see Hohaus 2017 for the data and an analysis.) Out of the blue, however, the imperfective will always be evaluated with respect to the utterance time; past and future readings are marked, but appear to be possible.

(16) Imperfective/ utterance time as evaluation time:

(16a) Your friend Malia tells you the latest news about your friend Sina:

(16b) *'O lo 'o tō Sina*  
 TAM(ipfv) pregnant Sina  
 ‘Sina is pregnant.’

(16c) What is Ioane currently doing?

(16d) *'O lo 'o siva Ioane*  
 TAM(ipfv) dance John  
 ‘John is dancing.’

<sup>3</sup> Unless otherwise indicated, all data come from work with Samoan native speakers conducted in Germany, Hawai‘i and Samoa over the past ten years. Elicitation material was designed following Matthewson (2004) and Matthewson (2011). The original orthography of the examples has been preserved, resulting in some variation in the use of diacritics, e.g., *sā* versus *sa* for the past perfective.

<sup>4</sup> “There are two particles for the past [which we analyse as past perfective here], *sā* and *na*, which are more or less interchangeable, but *na* is preferred for events that happened unexpectedly and had a short duration.” (Mosel and So‘o 1997, p. 21).

(17) Imperfective/ evaluation time prior to utterance time:

(17a) Esa has a job as a receptionist at the Samoan Outrigger hotel. Yesterday, her shift was from 11:00pm to 6:00am. A taxi arrived at 11:30pm.

(17b) *'O lo'o faigaluega pea Esa ae taunu'u mai loa isi malo*  
 TAM(ipfv) work still Esa but arrive DIR then other guest  
 'Esa was still working when the other guests arrived.'

(18) Imperfective/ utterance time prior to evaluation time:

(18a) This is a drawing<sup>5</sup> of a *fiafia* night that one of the hotels has planned for Wednesday night. Here's what they have in mind for tomorrow:



(18b) *'O lo'o sisiva teine ma tama i le fa'afiafiaga taeao*  
 TAM(ipfv) dance(pl) girl and boy PREP the entertainment tomorrow  
 'The girls and boys are dancing at tomorrow's entertainment show.'

Perfective-marked predicates, however, are restricted in their interpretation. The examples in (19) must be interpreted with a past evaluation time. The sentence in (19a) is thus only acceptable if, in the words of one speaker, "Sina had a baby; she already gave birth". If context forces the evaluation time to follow the utterance time (that is, a future interpretation), as in (20), the use of the past perfective is unacceptable.

(19) Imperfective/ utterance time as evaluation time:

(19a) *Sā tō Sina*  
 TAM(past.pfv) pregnant Sina  
 'Sina was pregnant.'

(19b) *Sā siva le teine*  
 TAM(past.pfv) dance the girl  
 'The girl danced.'

(20a) Epe is sewing a new dress for her sister. She still has some work left to do when I visit her. She tells me to come back tomorrow, when she has more time. Here's the reason:

(20b) *#Sau taeao, sā uma ai le ofu lea*  
 come tomorrow TAM(past.pfv) whole PRN the dress DEM(sg)  
 'Come tomorrow, the dress will be done.'

<sup>5</sup> Illustration by Zahra Kolagar.

Despite this restriction to past reference times, the marker cannot be plausibly analysed as a past tense: It cannot combine with the imperfective to yield a past imperfective, as shown in (21), even though Samoan syntactically allows TAM-stacking in the case of the inchoative and the imperfective (see Hohaus 2017).

- (21) \**Sā*                      ‘o lo ‘o        siva    le    teine  
          TAM(past.pfv)    TAM(ipfv)    dance   the   girl  
          (Intended) ‘The girl was dancing.’

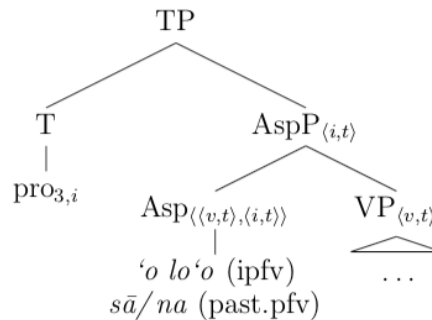
Neither can *sā* and *na* be used for ongoing events in the past: The unacceptability of (22) in the context described illustrates that the use of the marker requires the event to be contained in the reference time. One speaker comments, “Then she already bought a coconut.”

- (22a) Drawing of Tupe yesterday at a roadside stall that was selling coconuts for three tala each, showing her in the process of picking up a coconut:

- (22b) #*Sa*                      faatau    e        Tupe    i        le        niu  
          TAM(past.pfv)    buy        ERG    Tupe    PREP    the     coconut  
          (Intended) ‘Tupe was in the process of buying a coconut.’

Building on these observations, we suggest that the imperfective and the past perfective are aspectual operators, which at Logical Form combine with a morphologically null, free temporal variable in T, which receives its interpretation from the utterance context, as in (23).

- (23) The LF architecture of tense and aspect in Samoan:



While we assume a standard lexical entry for the Samoan imperfective, in (24a), we suggest that the perfective not only relates the running time of the event to the reference time, but also introduces a relational presupposition on its first argument, as in (24b): The evaluation time is required to be in the past. The operator thus fuses aspectual meaning with temporal meaning. Foreshadowing the analysis required for the embedded case, this evaluation time *t* is required to be past relative to some other time *t'*, rather than just the utterance time.

- (24a)  $\llbracket \text{'o lo 'o (ipfv)} \rrbracket = \lambda p_{\langle v, t \rangle}. \lambda t. \exists e [\tau(e) \supset t \ \& \ p(e) = 1]$   
 (24b)  $\llbracket \text{sā (past.pfv)} \rrbracket = \lambda t'. \lambda p_{\langle v, t \rangle}. \lambda t : t < t'. \exists e [\tau(e) \subseteq t \ \& \ p(e) = 1]$

Let’s apply this analysis to a minimal pair of examples: For the imperfective sentence in (16d), we derive the truth conditions in (25), namely that there is an event of John dancing whose running time includes a contextually provided time *t<sub>c</sub>*. By default, that time is going to be the utterance time, but as we have seen in (17) and (18) above, it can also be a time prior or preceding the time of utterance. This is an interesting finding of its own, especially in the light of data from other languages: While tenseless clauses in Washo (isolate; United States), an optional tense language, do not permit future interpretations (Bochnak 2016), they do in Medumba (Niger-Congo; Cameroon), which is a tenseless language (Mucha 2013).

(16d) ‘O lo ‘o siva Ioane  
 TAM(ipfv) dance John  
 ‘John is dancing.’

(25) Truth conditions for matrix imperfective:  
 $\llbracket (16d) \rrbracket = 1$  iff  $\exists e [\tau(e) \supset t_c \ \& \ e$  is an event of Ioane dancing in  $w_{@}$ ]

For the past perfective case in (19b), we derive (26). The sentence is only defined if context makes available an evaluation time  $t_c$  that precedes the utterance time. (The latter is a stipulation: In the matrix case, the past presupposition of the perfective has to be anchored to the utterance time.)

(19b) *Sā* siva le teine  
 TAM(past.pfv) dance the girl  
 ‘The girl danced.’

(26) Truth conditions for matrix past perfective:  
 $\llbracket (19b) \rrbracket = 1$  iff  $\exists e [\tau(e) \subseteq t_c \ \& \ e$  is an event of the girl dancing in  $w_{@}$ ]  
 $\llbracket (19b) \rrbracket$  is defined iff  $t_c < t^*$

We now have all the pieces of the analysis in place to be able to turn to the interpretation of complement and relative clauses. Crucially, under the analysis presented so far, Samoan is an aspect-prominent language. It is tenseless in the sense that, in the cases that we have discussed, there is no temporal operator in T, but just a free proform over times, which receives its interpretation from the utterance context.

We find that when embedded, this context dependency is replaced by a dependency on the evaluation time of the superordinate structure. We thus confirm an observation from the descriptive literature: “None of the Samoan TAM particles exclusively relates the reported event to the time of the speech event. ... In subordinate clauses such as relative and complement clauses, the point of reference is not the speech event, but the event reported by the main clause...” (Mosel and Hovdhaugen 1992, pp. 338-39)

## 2.2 The Data

### 2.2.1 Complement clauses

In Samoan, a past perfective embedded under a past perfective in a complement clause must receive a shifted reading, irrespective of the eventuality type encoded by the embedded predicate: The context in (27) is set up for a simultaneous reading, but the example sentence is unacceptable if the TAM in the complement clause is the past perfective. In the words of one speaker: “The sentence is still okay, but not with the story.” The desired simultaneous interpretation is however available with the imperfective in the complement clause.

(27a) You have not seen your friends Malia and Sina in a long time because they live in New Zealand now. Last week, however, you met Malia who is in Samoa visiting her family. She tells you: “Sina is expecting a baby!” You later tell your sister:

(27b) #*Sa* ta‘u mai e Malia [*sā* tō Sina]  
 TAM(past.pfv) tell DIR ERG Mary TAM(past.pfv) pregnant Sina  
 ‘Mary told me that Sina was pregnant’ (SHIFT only)

(27c) *Sa* ta‘u mai e Malia [*‘o lo ‘o* tō Sina]  
 TAM(past.pfv) tell DIR ERG Mary TAM(ipfv) pregnant Sina  
 ‘Mary told me that Sina was pregnant.’ (SIM only)

As in English, a past-perfect marked eventive predicate embedded under a past-perfect marked attitude in Samoan also only allows for a shifted reading, as shown in (28). The sentence can be used, for instance, to

report the reason why Heidi won't join us for dinner. However, it cannot be used to explain—say, after getting off the phone with Laura—why Heidi didn't take the call (= because of an ongoing dinner-eating event).

- (28) *Sa ta'u mai e Laura [sa 'ai e Heidi le mea'ai o le aftafi]*  
 TAM(pst.pfv) tell DIR ERG Laura TAM(pst.pfv) eat ERG Heidi the thing.eat of the evening  
 'Laura told me that Heidi had dinner.'<sup>6</sup> (SHIFT only)

The pattern extends to verbs of perception like *iloa* ('to see, to notice'), which generally exhibit a strong preference for simultaneous readings (see, e.g., Kusumoto 1999, pp. 78-79; Dickey 2001, pp. 192, 194). The embedded past perfective in (30a) is only acceptable in the context in (29b), which forces a shifted reading. The embedded imperfective in (30b) is unacceptable in that context, but acceptable in (29a), which allows only for a simultaneous reading.

- (29a) Today is October 8, 2015. Three days ago, Tigilau looked at his calendar and saw a note saying that Sina was staying in Apia that day. (SIM)

- (29b) Today is October 8, 2015. Yesterday, Tigilau looked at his calendar and saw that Sina was staying in Apia on October 5, 2017. (BACKWARD)

- (30a) *Na iloa e Tigilau [sā nofo Sina i Apia]* # (29a), ✓ (29b)  
 TAM(pst.pfv) notice ERG Tigilau TAM(pst.pfv) stay Sina in Apia  
 'Tigilau noticed that Sina had been in Apia.'  
 Comment from a speaker: "Sina has gone back already."

- (30b) *Na iloa e Tigilau [o lo'o nofo Sina i Apia]* ✓ (29a), # (29b)  
 TAM(pst.pfv) notice ERG Tigilau TAM(ipfv) stay Sina in Apia  
 'Tigilau noticed that Sina was in Apia.'

Before we turn to the temporal interpretation of relative clauses, let me summarise: For complement clauses in Samoan, we find the pattern in Table 2 below.

**Table 2:** *The temporal interpretation of complement clauses in Samoan*

	past perfective-under-past perfective	imperfective-under-past perfective
SIMULTANEOUS	#	✓
BACKWARD SHIFTED	✓	#

### 2.2.2 Relative clauses

This is also the pattern we find in relative clauses: With the past perfective and the imperfective, the temporal interpretation of the relative clause is always dependent on the superordinate tense (unlike in English, see also section 4.1 below). A past perfective in a relative clause embedded under a past perfective may only receive a shifted interpretation, (31). In a context that is set up for a simultaneous reading like (32), the past perfective in the relative clause is unacceptable. As one speaker explains: "They are talking after he's finished." In this context, the embedded imperfective is acceptable, however. Embedded under a past perfective, it yields the simultaneous interpretation. A further example is in (33).

- (31) *Sa talanoa Malia ma se tama [sa ita]*  
 TAM(pst.pfv) talk Mary with a boy TAM(pst.pfv) angry  
 'Mary talked to a boy who was angry.' (SHIFT only)

<sup>6</sup> I would like to thank Heidi Quinn (p.c.) for this example.



(32a) A drawing with Mary trying to talk to a performer at a *fiafia* night while he is dancing.

(32b) #*Sa talanoa Malia i le tama [sa siva]*  
 TAM(past.pfv) talk Mary PREP the boy TAM(past.pfv) angry  
 ‘Mary talked to the boy who danced.’ (SHIFT only)

(32c) *Sa talanoa Malia i le tama [‘o lo‘o siva]*  
 TAM(past.pfv) talk Mary PREP the boy TAM(ipfv) angry  
 ‘Mary talked to the boy who was dancing.’ (SIM only)

(33a) A drawing depicting Mary trying to comfort a crying boy.

(33b) *Sa talanoa Malia ma se tama [‘o lo‘o tagi]*  
 TAM(past.pfv) talk Mary with a boy TAM(ipfv) cry  
 ‘Mary talked to a boy who was crying.’ (SIM only)

This simultaneous interpretation also arises if the imperfective is embedded under future ‘*o le ‘ā*, as in (34).

(34a) A picture of Sina at the fish market. She will go there again on Sunday.

(34b) ‘*O le ‘ā fa‘atau Sina le i‘a [‘o lo‘o ola pea]*  
 TAM(prosp) buy Sina the fish TAM(ipfv) alive still  
 ‘Sina will buy a fish that is still alive.’

Recall that relative clauses in English not only allow for simultaneous and backward shifted readings, but also for the later-than-matrix interpretation. Relative clauses in Samoan do not: The sentence in (35) is only acceptable if Cillia married the minister of tourism (and not if her husband was appointed at some point after her marriage).

(35) *Sa fa‘aipoipo Cillia i le tamaloa [sa pitia]*  
 TAM(past.pfv) marry Cillia PREP the man TAM(past.pfv) become  
*fa‘aministā o turisi mo Samoa]*  
 minister of tourism for Samoa  
 ‘Cillia married a man who became the Samoan minister for tourism.’

We summarise our findings regarding the temporal interpretation of relative clauses in Table 3. Unlike in English, relative clauses in Samoan are not temporally independent of the matrix clauses that host them. They pattern just like complement clauses in that their interpretation is always relative to the superordinate structure.

**Table 3:** *The temporal interpretation of relative clauses in Samoan*

	past perfective-under-past perfective	imperfective-under-past perfective
SIMULTANEOUS	#	✓
BACKWARD SHIFTED	✓	#
LATER-THAN-MATRIX	#	n/a

The data can straightforwardly be accounted for when extending the analysis of the matrix cases to the embedded cases: In a nutshell, we derive this pattern by lambda abstraction over (one of) the time arguments of the embedded aspectual operators.

### 3 Analysis

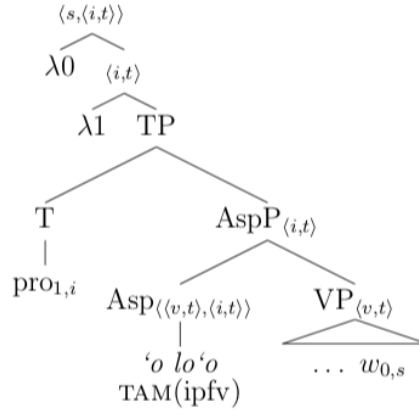
#### 3.1 Simultaneous readings

Complement clauses denote tensed propositions of type  $\langle s, \langle i, t \rangle \rangle$ . In the absence of an operator in the T-head, the simultaneous interpretation of the embedded imperfective is a result of lambda abstraction over the covert

temporal proform that we have posited in this syntactic position, as sketched in (36). For our example sentence from (27) above, the complement clause then denotes the tensed proposition in (37), namely that in the evaluation world, there is an ongoing state at the evaluation time of Sina being pregnant.

- (27) *Sa ta'u mai e Malia ['o lo' o tō Sina]*  
 TAM(past.pfv) tell DIR ERG Mary TAM(ipfv) pregnant Sina  
 ‘Mary told me that Sina was pregnant.’

- (36) Logical Form for complement clause with imperfective:



- (37) Denotation of complement clause with imperfective:  
 $\lambda w. \lambda t. \exists s [\tau(s) \supset t \ \& \ s \text{ is the state of Sina being pregnant in } w_{@}]$

As composition proceeds, the attitude verb, for which we assume the same lexical entry as in English, in (10a), fills the time argument slot of this tensed proposition with the running time of the matrix saying event, and—under our simplified analysis here—the world argument slot with the actual world. We derive the truth and definedness conditions in (38) for imperfective-under-past perfective.

- (10a)  $\llbracket say_{(\text{simplified})} \rrbracket = \lambda w. \lambda p_{\langle s, \langle i, t \rangle \rangle}. \lambda x. \lambda e. e \text{ is an event of } x \text{ saying in } w \text{ that } p(w)(\tau(e)) = 1$

- (38) Truth and definedness conditions for imperfective-under-past perfective in complement clause:  
 $\llbracket (27) \rrbracket = 1 \text{ iff } \exists e [\tau(e) \subseteq t_c \ \& \ e \text{ is an event of Mary saying in } w_{@} \text{ that}$   
 $\exists s [\tau(s) \supset \tau(e) \ \& \ s \text{ is the state of Sina being pregnant in } w_{@}]]$   
 $\llbracket (27) \rrbracket \text{ is defined iff } t_c < t^*$

The sentence is true if and only if there is an event of Malia saying in the actual world  $w_{@}$  that there is a state of Sina being pregnant in that world. The running time of the saying event must be contained in or equal to a contextually provided evaluation time  $t_c$ , and it must be included in the running time of the pregnancy state. At the time of Mary’s utterance, Sina thus had to have been pregnant (= the simultaneous reading). The presupposition of the past perfective in the matrix clause requires that context provide an evaluation time that is prior to the utterance time  $t^*$ .

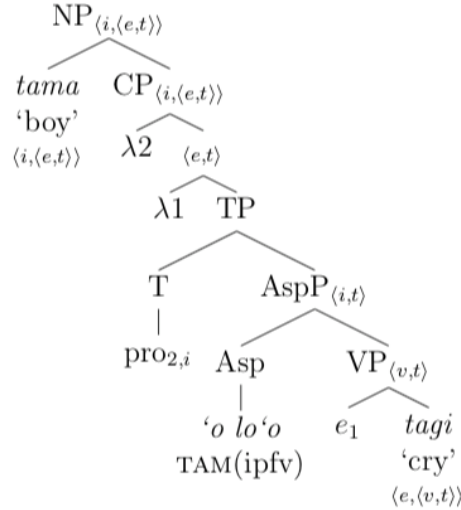
The derivation of the simultaneous reading of relative clauses works in a similar fashion. Relative clauses in Samoan denote tensed properties (type  $\langle i, \langle e, t \rangle \rangle$ ), a result of lambda abstraction over the time variable in T. In the case of the example from (33) above, the noun phrase that contains the relative clause has the structure in (39a) at LF.<sup>7</sup> Its interpretation is in (39b).<sup>8</sup> The dependent interpretation is incompatible with positing an utterance time variable in the CP-layer clause, as we have done in English. As a consequence, relative clauses in Samoan receive a temporally dependent interpretation (see below for further discussion).

<sup>7</sup> Here, the noun combines with the relative clause via Extended Predicate Modification #2: If  $\alpha$  is a branching node and  $\beta$  and  $\gamma$  its daughters,  $\llbracket \beta \rrbracket \in D_{\langle i, \langle e, t \rangle \rangle}$  and  $\llbracket \gamma \rrbracket \in D_{\langle i, \langle e, t \rangle \rangle}$ , then  $\llbracket \alpha \rrbracket = \lambda t. \lambda x. \llbracket \beta \rrbracket(t)(x) = 1 \ \& \ \llbracket \gamma \rrbracket(t)(x) = 1$ .

<sup>8</sup> Just like for English above, we use an extensional semantics here for ease of exposition.

- (33) *Sa talanoa Malia ma se tama* [‘o lo’o tagi]  
 TAM(past.pfv) talk Mary with a boy TAM(ipfv) cry  
 ‘Mary talked to a boy who was crying.’

(39a) Logical Form for relative clause with embedded imperfective:

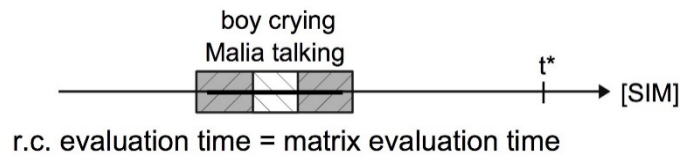


- (39b) Denotation of relative clause with embedded imperfective:  
 $\lambda t. \lambda x. x$  is a boy at  $t$  &  $\exists e [\tau(e) \supset t$  &  $e$  is an event of  $x$  crying]

Modulated by the weak determiner, which we assign a standard analysis, in (40), the matrix clause and the relative clause end up having the same evaluation time. The resulting truth and definedness conditions for (33) are in (41). We derive a simultaneous reading: The (past) evaluation time for the relative clause is also the evaluation time for the matrix clause.

(40)  $\llbracket se$  (‘a, some’)  $\rrbracket = \lambda P_{\langle i, \langle e, t \rangle \rangle}. \lambda Q_{\langle i, \langle e, t \rangle \rangle}. \lambda t. \exists x [P(t)(x) = 1 \ \& \ Q(t)(x) = 1]$

- (41) Truth and definedness conditions for imperfective-under-perfective in relative clause:  
 $\llbracket (33) \rrbracket = 1$  iff  $\exists x [x$  is a boy at  $t_c$  &  $\exists e [\tau(e) \supset t_c$  &  $e$  is an event of  $x$  crying] &  
 $\exists e' [\tau(e') \subseteq t_c$  &  $e'$  is an event of Mary talking to  $x]$   
 $\llbracket (33) \rrbracket$  is defined iff  $t_c < t^*$



### 3.2 Shifted readings

We suggest that in the case of the embedded past perfective, binding does not target the covert temporal proform in T, but rather the presupposition introduced by the aspectual operator (which ultimately determines which time the past is relative to). Let us look at an example, (27). We want to derive that the embedded evaluation time (= to which aspect relates Sina’s pregnancy event) is prior to the matrix evaluation time (= to which aspect relates the talking event). Under our analysis of the past perfective, repeated in (24b), this is going to be a presupposition. In order to relativise the presupposition to the matrix evaluation time, we will have to bind it, as sketched in the Logical Form for (27) in (42).





the purpose of creating the right semantic type for the interpretation of the embedded structure, type  $\langle s, \langle i, t \rangle \rangle$  in the case of the complement clause and type  $\langle i, \langle e, t \rangle \rangle$  in the case of the relative clause.

Why abstract over the temporal presupposition of the perfective in the first place, though? For the sentence from (27), an alternative Logical Form might suggest itself, as sketched in (50). Here, lambda abstraction is over the temporal proform in T, and the first time argument of the perfective is a free variable (here, indexical to the utterance time). The truth and definedness conditions that we would then derive are in (51). Crucially, they require the running time of the embedded eventuality  $\tau(s)$  to overlap with or be contained in the running time of the matrix event  $\tau(e)$ , the duration of Mary’s utterance. This is implausible assuming that communication is instantaneous (and even impossible in this particular case), of course.

- (27) *Sa ta’u mai e Malia [sā tō Sina]*  
 TAM(past.pfv) tell DIR ERG Mary TAM(past.pfv) pregnant Sina  
 ‘Mary told me that Sina was pregnant.’

- (50) An alternative Logical Form for perfective-under-perfective in complement clause?

$$[\text{TP} [\text{T} \text{pro}_{9,i}] [\text{AspP}_{\langle i, t \rangle} [\text{Asp TAM(past.pfv)} t^*] [\text{VP Malia} [\text{say}_{w@} [\text{TP} [\text{T} \text{pro}_{7,i}] [\text{AspP} [\text{Asp TAM(past.pfv)} t^*] [\text{VP Sina pregnant}_{w_0,s}]]]]]]]]]$$

- (51)  $\llbracket (50) \rrbracket = 1$  iff  $\exists e [\tau(e) \subseteq t_c \ \& \ e$  is an event of Mary saying in  $w@$  that  
 $\exists s [\tau(s) \subseteq \tau(e) \ \& \ s$  is the state of Sina being pregnant in  $w@$ ]]  
 $\llbracket (50) \rrbracket$  is defined iff  $t_c < t^*$  and  $\tau(e) < t^*$

The Logical Form in (50) might therefore be ruled out. We will have to leave it open here, though, in how far implausibility is enough to explain why lambda abstraction may only target the time variable related to the presupposition in the case of an embedded past perfective. For discussion of a related question for English, see von Stechow, Heim, and Schwarzschild (2017, pp. 35-40), who point out that if plausibility is decisive here, we might be able to manipulate it in our favour in scenarios where the running time of the embedded eventuality is really short. We will leave this question for further research.

### 3.3 Interim summary

We find that in Samoan, for the two TAM that we have investigated here, the temporal interpretation of relative and complement clauses always depends on the superordinate structure, as summarised in Table 4. The interpretation of an imperfective embedded under an imperfective thus yields a simultaneous reading in both complement and relative clauses. Embedding a past perfective under a past perfective in either construction yields a backward shifted interpretation.

**Table 4:** The temporal interpretation of complement and relative clauses in Samoan

	imperfective-under-past perfective	past perfective-under-past perfective
complement clauses	SIMULTANEOUS	BACKWARD SHIFTED
relative clause		

The simultaneous interpretation of imperfective-under-past perfective falls out right away from the architecture that we have proposed for Samoan tense and aspect, under which ‘*o lo’o*’ encodes the imperfective aspect and there is just a proform over times in T, which gets abstracted over when embedded. (This analysis also correctly predicts that imperfective-under-prospective receives a simultaneous interpretation, although this has not been our focus here.) The backward shifted interpretation of the embedded past perfective comes with a twist, as this is an aspectual operator which also introduces a presupposition that the evaluation time (= provided by the temporal proform in T) must be past relative to another time. It is this time argument that we abstract over in order to get a relative past interpretation in embedded environments, the backward shifted reading.

## 4 Concluding remarks

### 4.1 *Contrasting English and Samoan*

Let us briefly point out some lexical and structural differences between English and Samoan when it comes to the composition of temporal meaning in subordinate constructions. In English, past-under-past in complement clauses is structurally ambiguous (by virtue of a sequence-of-tense deletion rule, or the like). Samoan can be characterised as tenseless in that the language lacks temporal operators in T. As a consequence, any type of sequence-of-tense rule cannot apply, as should be particularly clear in the case of imperfective-under-imperfective. We might however want to ask whether the mechanisms that derive simultaneous readings of past-under-past in complement clauses in English may apply to past perfective-under-past perfective in Samoan. Given the nature of the Samoan past perfective, we believe that it cannot either: To put it naively, deletion would have to target the aspectual head. If the lower past perfective were to be deleted, the aspectual meaning would be deleted along with the temporal presupposition, resulting in a type mismatch, as sketched in (52).

(52) [TP [T  $pro_{9,i}$ ] [<sub>AspP</sub> [<sub>Asp</sub> past.pfv  $t^*$ ] ... [TP [T  $pro_{7,i}$ ] ~~[<sub>AspP</sub> [<sub>Asp</sub> past.pfv] [VP ... ]]]]]]~~

Samoan thus does not seem to create the right kind of structural environment in complement clauses for a sequence-of-tense rule to apply (and thus differs from languages in which such a rule does not apply, despite the right kind of LF configuration; see the next subsection below).

How do English and Samoan relative clauses compare? Under the analyses presented here, English relative clauses differ from their Samoan counterpart in semantic type (type  $\langle e, t \rangle$  versus type  $\langle i, \langle e, t \rangle \rangle$ ). This variation derives from the stipulation that English relative clauses host a temporal pronoun indexical to the utterance time, which the tense operator is interpreted in relation to. Under the analysis presented here, the CP-layer of the Samoan relative clause does not host such a temporal indexical, and the evaluation time variable in a Samoan relative clause is abstracted over. We have yet to understand the reasons underlying this variation.

### 4.2 *The broader cross-linguistic picture*

As far as the broader cross-linguistic picture is concerned, Samoan contributes a new pattern to the interpretation of embedded tenses (see, e.g., Kusumoto 1999, Grønn and von Stechow 2010, Ogihara and Sharvit 2012, Ogihara 2015). In Samoan, both attitude complements and relative clauses are necessarily interpreted as temporally dependent on the superordinate structure. All of the languages that have featured prominently in the research literature on embedded tenses (English, German, Japanese and Russian, in particular) appear to allow temporally independent interpretations of relative clauses, even though they vary with respect to the interpretative possibilities for complement clauses. Japanese (53), unlike its English counterpart, only allows for the backward shifted interpretation, for instance:

(53) *Bernhard-wa Junko-ga byooki-dat-ta to it-ta* (Japanese)  
 Bernhard-TOP Junko-NOM sick-be-PAST COMPL say-PAST  
 ‘Bernhard said that Junko was sick.’ (BACKWARD only)  
 (Kusumoto 1999, p. 84, no. (118))

The latter variation is often couched as parametric variation in the availability of a sequence-of-tense rule [ $\pm$ SoT]. While Samoan has the appearance of  $[-$ SoT], the variation we observe falls outside of the scope of the parameter: As we have seen in the previous subsection, even if a sequence-of-tense rule would exist for Samoan, it might not be able to apply. Vice versa, the simultaneous readings for which we require such a mechanism in English, in Samoan come about by a different structural configuration, the embedded imperfective aspect. The view from Samoan thus not only highlights the importance of aspectual meaning for the temporal interpretation of subordinate constructions, it also raises interesting questions regarding the different components of the grammar that are involved in the composition of temporal meaning (and of variation therein). Only the in-depth study of a larger sample of typologically diverse languages will be able address these questions.

### Abbreviations used in glosses

COMPL = complementiser, DEM = demonstrative, DIR = directional particle, ERG = ergative, ipfv = imperfective, NOM = nominative, pfv = perfective, pl = plural, PREP = preposition, prosp = prospective, sg = singular, TAM = temporal-aspectual marker, and TOP = topicalisation.

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# THE SYNTAX OF MALAGASY AUXILIARIES: INITIAL OBSERVATIONS\*

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## Abstract

This paper examines the class of auxiliaries in Malagasy, as defined by Rajaona (1972). Data from morphology and syntax indicate that auxiliaries are distinct from both verbs/adjectives and adverbs. Preliminary data from VP ellipsis show that auxiliaries can be further sub-divided into those that license ellipsis (modals) and those that do not.

**Keywords:** Auxiliaries, Malagasy, VP ellipsis, word order.

**ISO 639-3 codes:** mlg, ind, jav

## 1 Introduction

Rajaona (1972) describes a class of “auxiliaries” in Malagasy, which he defines based on their form and their position. The goal of this paper is to present some initial data about these elements, with the long-term goal being to determine their category and position in the clause. For the purposes of this paper, I will continue to use Rajaona’s terminology and refer to them as auxiliaries.

The auxiliaries according to Rajaona are presented in table 1. Auxiliaries are claimed to be distinct from predicates in the following ways. First, they cannot be the main predicate of a clause. Second, they are morphologically invariant. And third, they appear before the main predicate. Auxiliaries are also to be distinguished from adverbs, based on their position preceding the main predicate. Rajaona further sub-classifies the auxiliaries based on the tense of their complement, as shown in Table 1.

**Table 1:** *Auxiliaries according to Rajaona (1972).*

FUTURE		PRESENT AND PAST		ALL TENSES		ALL TENSES	
<i>tokony</i>	should	<i>sendra</i>	by accident	<i>efa</i>	already	<i>toa</i>	seem
<i>te</i>	want	<i>avy</i>	before	<i>vao</i>	just	<i>tsy maintsy</i>	must
<i>ila</i>	going to	<i>azo</i>	can	<i>saika</i>	almost	<i>mbola</i>	still
<i>diva</i>	going to	<i>lasa</i>	become	<i>somary</i>	a little	<i>mba</i>	in spite
<i>ndeha</i>	going to	<i>tonga</i>	become	<i>mody</i>	pretend	<i>tena</i>	really
<i>aoka</i>	optative						

A quick glance at this table clearly shows that these auxiliaries are semantically heterogeneous. There are typical TAM markers (tense, aspect, modality), but also intensifiers, raising predicates and adverbial-like elements that mark notions such as volitionality. This heterogeneity thus raises the following questions. Do auxiliaries indeed form a class distinct from verbs, adjectives and adverbs? Are there sub-groupings of auxiliaries not identified by Rajaona? Where are these elements located in the syntactic structure?

To answer my research questions, I will look at the morphological and syntactic properties of a subset of the auxiliaries from Table 1 and I show that they do not pattern with verbs (or other predicates) or adverbs. I discuss two possible syntactic positions for auxiliaries and suggest that the auxiliary is merged in a high position in the clause, above the position of the predicate. Some preliminary data suggest that it is possible to further subdivide the auxiliaries into two classes: those that license VP ellipsis and those that do not.

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## 2 Background on Malagasy

Malagasy is an Austronesian language spoken in Madagascar, with VOS word order. Malagasy is known for its rich “voice” system, as illustrated in (1). Simplifying somewhat, the verbal morphology indicates the role of the clause-final subject (underlined in the examples in (1)).<sup>1</sup>

- (1) a. Actor Topic (AT) – Subject is agent  
 Nanapaka ity hazo ity tamin’ ny antsy i Sahondra.  
 PST.AT.cut this tree this PST.PREP DET knife Sahondra  
 ‘Sahondra cut this tree with the knife.’
- b. Theme Topic (TT) – Subject is theme  
 Notapahin’ i Sahondra tamin’ ny antsy ity hazo ity.  
 PST.TT.cut Sahondra PST.PREP DET knife this tree this  
 ‘This tree was cut by Sahondra with the knife.’
- c. Circumstantial Topic (CT) – Subject has some other role  
 Nanapahan’ i Sahondra ity hazo ity ny antsy.  
 PST.CT.cut Sahondra this tree this DET knife  
 ‘The knife was used by Sahondra to cut the tree.’

The derivation of VOS word order and the nature of the voice system has been the source of much debate in the literature. I refer the interested reader to Guilfoyle, Hung and Travis (1989), Rackowski and Travis (2000), and Pearson (2001, 2005). Voice morphology is available for all verbs in Malagasy and, as we will see below, this morphology allows us to distinguish auxiliaries from verbs.

## 3 Morphology

In this section, I look at clues from morphology that auxiliaries are distinct from verbs.

### 3.1 Voice

As mentioned by Rajaona (1972:306-308), true verbal predicates (*mikasa* ‘intend’, *afaka* ‘can’, etc.) have voice alternations and can take pronominal clitics (in non-active voices). In (2)a, the main verb *mikasa* appears with the prefix *mi-*, which indicates Actor Topic. In (2)b, the same verb root (*kasa*) is in the Theme Topic, as marked by the suffix *-ina* and it also takes the second person pronominal clitic *-nao*.

- (2) a. Mikasa hamaky ilay boky aho  
 PRS.AT.intend FUT.AT.read DEF book 1SG  
 ‘I intend to read the book.’
- b. Kasainao ve ny hamaky ilay boky?  
 TT.intend.2SG Q DET FUT.AT.read DEF book  
 ‘Do you intend to read the book?’

If auxiliaries are verbs, they should take voice morphology and host pronominal clitics. This test, however, is not without complications. Some of the auxiliaries have what look like non-auxiliary use and meaning. In other words, there appears to be some homophony. For example, *efa* ‘already’ is homophonous with *efa* ‘finished’. The latter, but not the former, allows voice morphology and pronominal clitics. In the case of *te* ‘want’, there is a non-reduced form *tia* that takes voice markers and clitics.

<sup>1</sup> I use the Leipzig glossing conventions, as well as the following:

AT – actor topic	CONJ - conjunction	CT – circumstantial topic	PREP - preposition
REDUP - reduplication	TT – theme topic		

- (3) Tiako            hohanina    ilay    voankazo  
 TT.want.1SG    FUT.TT.eat    DEF    fruit  
 ‘I want to eat the fruit.’

Setting aside these cases, most auxiliaries do not, as shown by the impossibility of the examples in (4).

- (4) a. \*tokoninao  
 should.2SG  
 b. \*saikako  
 almost.1SG

However, a few auxiliaries do appear to take voice and allow for pronominal clitics. In (5)a, *azo* ‘can’ takes the pronominal clitic *ko* and in (5)b, it carries circumstantial topic voice marking (and the clitic). More research is necessary to determine if clitics and voice marking always pattern together.

- (5) a. Azonao                    idirana    ny    efitra  
 can.2SG                    CT.enter    DET    room  
 ‘You can go into the room.’  
 b. Izao                    no            tsy    nahazoako    nandefitra    izany  
 this                    FOC            NEG    CT.can.1SG    NEG.AT.endure    that  
 ‘This is why I wasn’t able to endure that.’

Thus, while most auxiliaries are morphologically invariant, some are not.

### 3.2 Reduplication

Malagasy has a very productive process of (partial) reduplication that can apply to most lexical categories (Keenan and Polinsky 1998). The examples in (6)a,c illustrate reduplication of *be* ‘big’ and *mena* ‘red’, respectively. As the data in (6)b,c show, the auxiliaries *te* ‘want’ and *tena* ‘really’ do not permit reduplication, despite their phonological similarity.

- (6) a. bebe                                    c. menamena  
 big.REDUP                                    red.REDUP  
 ‘somewhat big’                                    ‘somewhat red’  
 b. \*tete                                    d. \*tenatena  
 want.REDUP                                    really.REDUP

Given that reduplication does not target functional categories in Malagasy, the absence of reduplication suggests that auxiliaries are functional in nature.

### 3.3 Interim summary

Summing up, auxiliaries do not pattern morphologically with predicates in terms of voice, pronominal clitics and reduplication. The pattern, however, is complicated by two facts. First, as we saw in (5) some auxiliaries allow voice and clitics. Second, as noted above, many auxiliaries appear to have non-auxiliary uses and meanings. An important question is therefore whether these are the same lexical items that can be inserted in different positions (e.g., a lexical position and a functional position) or whether there are two distinct vocabulary items (true homophony). This is not a question that I will resolve here, but it is obviously an important one for future research.

#### 4 Syntax

I now turn to the syntactic distribution of the auxiliaries. Much like control predicates (e.g., *mikasa* ‘intend’ in (7)a), auxiliaries appear pre-verbally, as seen in (7)b. Their position is fixed: they cannot appear after the predicate, as illustrated by the ungrammaticality of (7)c.

- (7) a. Mikasa            hilalao            baolina            ianao.  
 PRS.AT.intend    FUT.AT.play        ball                2SG  
 ‘You intend to play ball.’
- b. Te                    hilalao            baolina            ianao.  
 want                FUT.AT.play        ball                2SG  
 ‘You want to play ball.’
- c. \*Hilalao            baolina            te                    ianao.  
 FUT.AT.play        ball                want                2SG

The fixed position of auxiliaries distinguishes them from certain adverbs that can appear before and after the predicate (e.g., *angamba* ‘perhaps’).

- (8) a. Angamba          hamaky            boky            ianao.  
 perhaps            FUT.AT.read        book            2SG  
 ‘You are possibly going to read a book.’
- b. Hamaky            boky            angamba          ianao.  
 FUT.AT.read        book            perhaps          2SG

Otherwise, as noted by Rajaona (1972:308), most adverbs appear after the predicate (see Rackowski 1998 and Rackowski and Travis 2000 for discussion). This position distinguishes auxiliaries from adverbs.

Given their pre-predicate position, auxiliaries can also precede the focused element in a cleft. Malagasy has a cleft construction where the focused element appears clause-initially, followed by an invariable particle *no*, as illustrated in (9). There is evidence that the focused element is the main predicate (Dahl 1986, Paul 2001); for example, the focused element can take negation (unlike arguments), as seen in (9)b.

- (9) a. Ny            mpianatra            no            miteny.  
 DET    student                            FOC    PRS.AT.speak  
 ‘It is the students who are speaking.’  
 Lit. ‘The ones who are speaking are the students.’
- b. Tsy    ny            mpianatra            no            miteny.  
 NEG    DET    student                            FOC    PRS.AT.speak  
 ‘It isn’t the students who are speaking.’  
 Lit. ‘The ones who are speaking are not the students.’

As shown in (10), auxiliaries can precede the focused element.

- (10) a. Efa            ny            mpianatra            no            miteny.  
 already    DET    student                            FOC            PRS.AT.speak  
 ‘It is already the students who are speaking.’  
 Lit. ‘The ones who are speaking are already the students.’
- b. ?Azo            ny            efitranoko            no            idiranao.  
 can            DET    house.1SG            FOC    TT.enter.2SG  
 ‘You can enter my house.’  
 Lit. ‘The thing you enter can be my house.’

The pre-focus position is expected, given that auxiliaries precede the main predicate and the focus is the main predicate. Of the auxiliaries that I have tested, only *te* ‘want’ does not appear in this position. I do not explain this restriction here, but I direct the reader to the conclusion for some discussion.

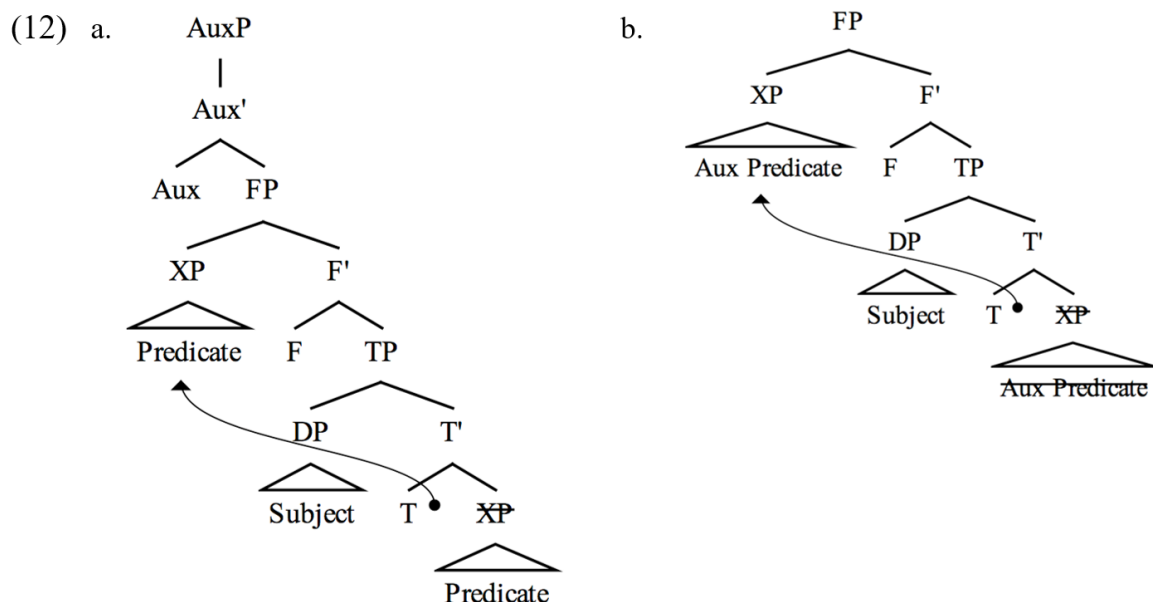
Finally, as noted by Rajaona (1972:307), auxiliaries cannot be the main predicate (but see section on VP ellipsis).

- (11) \*Te (boky) aho.  
 want book 1SG  
 ‘I want (a book).’

Thus, we see that auxiliaries do not pattern syntactically with adverbs or verbs/predicates. In the next section, I provide some tentative suggestions for the syntactic position of auxiliaries.

## 5 Preliminary structure

For the purposes of this paper, I assume that the derivation of VOS involves predicate fronting to a position above the subject (see e.g., Rackowski and Travis 2000, Pearson 2001). Given the clause-initial position of auxiliaries there are (at least) two plausible structural positions. A first possible structure is shown in (12)a, where the auxiliaries are merged in a high Aux head above the position of the fronted predicate. In the second structure, the auxiliaries are merged lower and front along with the predicate, as illustrated in (12)b.



The two structures make different claims concerning the constituency of a sentence with an auxiliary. In (12)a, the predicate phrase (XP) forms a constituent independent from the auxiliary, while in (12)b, the auxiliary and the predicate together form a constituent.

Initial data from coordination suggest that the structure in (12)b is not plausible. Malagasy has two coordinating conjunctions, *sy* and *ary*. The former is used for coordinating constituents that are smaller than a clause; the latter is for clauses. We see in (13)a that it is possible to coordinate two predicate phrases under a single auxiliary with *sy*. The example in (13)b, however, shows that coordinating two predicate phrases along with an auxiliary requires *ary*.

- (13) a. Tokony [hamaky boky] sy  
 should FUT.AT.read book CONJ  
 [hanoroitra taratasy] i Koto  
 FUT.AT.write letter Koto  
 ‘Koto should read books and write letters.’
- b. [Tokony hamaky boky] ary/\*sy  
 should FUT.AT.read book CONJ  
 [tsy maintsy hanoroitra taratasy] i Koto  
 must FUT.AT.write letter Koto  
 ‘Koto should read books and must write letters.’

The impossibility of *sy* in (13)b suggests that the auxiliary and the predicate phrase do not form a constituent independent of the subject, contrary to what is shown in (12)b. To account for the presence of *ary*, the clausal coordinator, I suggest that (13)b involves clausal conjunction with topic drop (Koto should read books and Koto must write letters).<sup>2</sup> Further investigation is clearly required – for example, as pointed out by a reviewer, the two structures make different predictions about the scope of the auxiliary with respect to the subject: if (12a) is the correct structure, we expect to find evidence that the auxiliary scopes over the subject.

## 6 VP ellipsis

I now turn to another syntactic property of auxiliaries: the ability to license VP ellipsis. Travis (2005) argues that Malagasy has V-stranding VP ellipsis (Goldberg 2005). She shows that examples such as (14)b involve ellipsis and not argument drop. Note that the ~~strike through~~ is used in the examples to indicate the identity of the elided material, not an analysis.

- (14) a. Nametraka ny boky teo ambonin’ny latabatra ve Rakoto?  
 PST.AT.put DET book PST.there top DET table Q Rakoto  
 ‘Did Rakoto put the book on the table?’
- b. Nilaza Rasoafa ...  
 PST.AT.say Rasoafa that  
 nametraka ~~ny boky teo ambonin’ny latabatra~~ izy.  
 PST.AT.put det book PST.there top DET table 3  
 ‘Rasoafa said that he did.’

Turning now to auxiliaries, ellipsis is licensed by *te* ‘want’ and the modals (*tokony* ‘should’, *azo* ‘can’, *tsy maintsy* ‘must’). In (15), I provide an example of VP ellipsis in a subordinate clause while (16) illustrates VP ellipsis in a coordinate structure.

- (15) a. Te hilalao i Koto nefa mino i Soa...  
 want FUT.AT.play Koto but PRS.AT.believe Soa  
 ‘Koto wants to play but Soa thinks...’
- b. fa tsy tokony ~~hilalao~~ izy  
 COMP NEG should FUT.AT.play 3  
 ‘...that he shouldn’t.’
- (16) a. Tokony hamaky boky i Koto...  
 should FUT.AT.read book Koto  
 ‘Koto should read books...’
- b. ary tokony ~~hamaky boky~~ koa i Soa.  
 CONJ should FUT.AT.read book also i Soa  
 ‘...and Soa should too.’

<sup>2</sup> Note that *ary* is possible in (13)a for some speakers. These speakers allow *ary* for coordination of all categories, but they nevertheless restrict *sy* to categories smaller than a clause. Therefore *sy* remains ungrammatical in (13b) even for these speakers.

Other auxiliaries, however, do not allow VP ellipsis, whether in subordinate clauses or coordinate structures. This restriction is shown for *efa* ‘already’ in (17) and (18).

- (17) \*Efa nody i Koto nefa mino  
 already PST.AT.go.home Koto but PRS.AT.believe  
 i Soa fa tsy efa ~~nody~~ iza  
 Soa comp NEG already PST.AT.go.home 3  
 ‘Koto has already gone home but Soa thinks he hasn’t yet.’
- (18) a. Efa nivity fanomezana Rabe...  
 already PST.AT.buy present Rabe  
 ‘Rabe has already bought presents ...’  
 b. \*ary efa nivity fanomezana koa Rakoto  
 CONJ already PST.AT.buy present also Rakoto  
 (intended) ‘...and Rakoto already has too.’

Table 2 lists the auxiliaries that I have tested for VP ellipsis.

**Table 2:** VP ellipsis

	VPE embedded clause	VPE coordinated CP
<i>te</i> ‘want’	*	√
<i>tokony</i> ‘should’	√	√
<i>azo</i> ‘can’	√	√
<i>tsy maintsy</i> ‘must’	√	*
<i>vao</i> ‘just’	*	*
<i>efa</i> ‘already’	*	*
<i>saika</i> ‘almost’	*	*

It should be noted that the data are preliminary and many questions remain. For example, I have not shown that these are in fact instances of VP ellipsis (see e.g., Fortin 2007 on Indonesian).

## 7 Conclusion

As stated at the beginning of this paper, the present project is an initial investigation into auxiliaries. It is not clear what the syntactic category and position of these elements are. On the one hand, Rajaona’s initial observations are valid: auxiliaries differ both morphologically and syntactically from predicates and adverbs. On the other hand, they do not all pattern uniformly and may therefore not be a natural class. The emerging pattern is presented in Table 3, where the grey cells represent an absence of data. The first three vocabulary items are traditionally treated as verbs (or adjectives in the case of *afaka* ‘can’). The next element is *te* ‘want’, which differs from the others in not being possible in the pre-cleft position and only licensing VP ellipsis in coordinated CPs. The three modals pattern as a group, except for the fact that *azo* is more verb-like in allowing voice and clitics. Finally, *vao* ‘just’, *efa* ‘already’ and *saika* ‘almost’ form a group.

**Table 3:** Summary of properties

		voice	pre-cleft	VPE embedded	VPE coord CP
<i>mikasa</i>	intend	√	*		
<i>mety</i>	accept	*	√		
<i>afaka</i>	can	√	√		
<i>te</i>	want	*	*	*	√
<i>tokony</i>	should	*	√	√	√
<i>tsy maintsy</i>	must	*	√	√	*
<i>azo</i>	can	√	?	√	√
<i>vao</i>	just	*	√	*	*
<i>efa</i>	already	*	√	*	*
<i>saika</i>	almost	*	√	*	*



Further research into these auxiliaries will be necessary to tease apart the differences. Several issues remain to be investigated, including the force and flavour of the modals (see e.g., Vander Klok 2012 on Paciran Javanese) and the connection, if any, to restructuring and complex predicates more generally.

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# EMERGENCE OF THE FAITHFUL BY CONSONANT COPYING IN A TAGALOG LANGUAGE GAME

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## Abstract

The Tagalog language game Tadbaliiks transposes the last syllable to the beginning of the word (*tagálog* → *logtága* ‘Tagalog’, N). Suffixed words exhibit ‘consonant copying’ (*palit-án* → *tànpalít* ‘exchange [object focus]’, V); while corresponding root words do not (*palít* → *litpá* ‘exchange’, V). Suffixation is the conditioning factor, not number of syllables, consonant versus vowel finality, or stress. Where previous analyses of Tadbaliiks (Bagemihl 1989; Sanders 2000) do not speak to consonant copying, and previous research on language games (Ito, Kitagawa & Mester 1996; Borowsky & Avery 2009) has identified cases of The Emergence of the Unmarked (TETU) (McCarthy & Prince 1995), this paper offers an Optimality Theory (Prince & Smolensky 1993) analysis of Tadbaliiks consonant copying where emergent faithfulness to the root is the driving force.

**Keywords:** Tagalog, language game, phonology, The Emergence of The Faithful, The Emergence of The Unmarked

**ISO 639-3 codes:** tgl

## 1 Introduction

Tadbaliiks<sup>1</sup> is one of a number of language games (Garcia 1934; Conklin 1956) – or ‘ludlings’ (Laycock 1972) – played by speakers of Tagalog (Austronesian, Philippines). The game transposes the last syllable to the beginning of the word, as underlined in (1), and schematised in (2).<sup>2, 3</sup>

(1) tagálog → logtága Tagalog, N

(2)  $\sigma_1 \dots \sigma_{n-1} \sigma_n \rightarrow \sigma_n \sigma_1 \dots \sigma_{n-1}$

Suffixed words exhibit ‘consonant copying’ of the final consonant of the root, exemplified in (3). In words suffixed with either of Tagalog’s two suffixes, *-in* or *-an*, the final consonant of the root is syllabified with the suffix. Descriptively, when the game is played on suffixed words, the final consonant of the root moves along with its syllable to the beginning of the word, as expected; but in addition, a copy of the consonant remains in the original root-final position:

(3) (a) palit → litpá \*litpál exchange, V

(b) palit-án → tánpalít \*tánpalí exchange (object focus), V

The Tadbaliiks data reported in this article were collected by the author from two native speakers of Tagalog.<sup>4</sup> Both speakers were born and raised in the Philippines and played Tadbaliiks as children. They

<sup>1</sup> The name *Tadbaliiks* is derived from *baligtad* ‘reverse’ by (2), plus optional game *-s* and voicing assimilation; cf. the similar French language game *Verlan* (Lefkowitz 1991; Plénat 1995; i.a.) from *l’envers* ‘the reverse’.

<sup>2</sup> Tagalog words → Tadbaliiks words; transposed syllables underlined; copied consonants in **bold**; part of speech abbreviations: A = adjective, N = noun, Num = number, P = preposition, V = verb.

<sup>3</sup> See Treiman and Danis (1988) for experimental results of a last-to-first syllable game in (2) in English.

<sup>4</sup> Many of the data points in this paper were inspired by Tagalog data in French (1992), Sabbagh (2004), and Zuraw (2012).

subsequently emigrated – one to Singapore, the other to the United States – and are now in their mid-20s. Following some variation in early elicitation, the stable pattern is reported here.

In outline, §2 demonstrates that it is suffixation that conditions consonant copying, rather than number of syllables, consonant versus vowel finality, or stress. §3 offers an Optimality Theory (Prince & Smolensky 1993) analysis of Tadbaliiks consonant copying where emergent faithfulness to the root is the driving force. Emergence of the faithful is compared with The Emergence of the Unmarked (TETU) (McCarthy & Prince 1995) in §4. Previous analyses and other alternatives are considered in §5, one of which precipitates a more precise characterisation of root faithfulness in §6. §7 concludes.

## 2 Suffixation conditions consonant copying

§3 will put forward an Optimality Theory analysis of consonant copying in Tadbaliiks as motivated by emergent faithfulness to the root. The root faithfulness analysis of consonant copying will correctly predict that copying applies in suffixed words, and not root words. But before concluding that suffixation is the conditioning factor, we should rule out other possibilities: (i) the number of syllables in the word; (ii) whether the word ends in a consonant or a vowel; and (iii) the position of stress.

First, the number of syllables. It could be that consonant copying is only possible in words beyond a certain length, perhaps due to a pressure against repetition over shorter distances. However, in (4) consonant copying applies to suffixed words regardless of whether they are three (a) or two (b) syllables in length; but not to root words, regardless of whether they are three (c) or two (d) syllables in length. Note additionally the contrast between suffixal *-an* in (a) and root *-an* in (c), which shows that consonant copying is not conditioned by the phonological form *-an*.

(4) Number of syllables? No.

- |     |                                 |   |   |
|-----|---------------------------------|---|---|
| (a) | 3 syllables, suffixed, ✓copying |   |   |
|     | <u>hawák-an</u>                 | → | <u>kanháwak</u> take hold of something, V   |
| (b) | 2 syllables, suffixed, ✓copying |   |   |
|     | <u>tren-ín</u>                  | → | <u>níntrén</u> travel somewhere by train, V |
| (c) | 3 syllables, root, ✗copying     |   |   |
|     | <u>tahánan</u>                  | → | <u>nantáha</u> home, N                      |
| (d) | 2 syllables, root, ✗copying     |   |   |
|     | <u>háwak</u>                    | → | <u>wákha</u> grip, N                        |

Second, whether the word ends in a consonant or a vowel. It could be that consonant copying is motivated by the desire to maintain word shape, such that a consonant-final Tagalog word remains consonant-final in Tadbaliiks. However, while copying applies in (5) to consonant-final suffixed (a), it does not apply to consonant-final root (b) or vowel-final root (c).<sup>5</sup> Thus the C/V nature of the final segment does not condition consonant copying.

(5) Consonant or vowel finality? No.

- |     |  |   |   |
|-----|--|---|---|
| (a) | C-final, 3 syllables, suffixed, ✓copying |   |   |
|     | <u>hawák-an</u>                          | → | <u>kanháwak</u> take hold of something, V |
| (b) | C-final, 3 syllables, root, ✗copying     |   |   |
|     | <u>tahánan</u>                           | → | <u>nantáha</u> home, N                    |

<sup>5</sup> There are no vowel-final suffixed words in Tagalog.

- (c) V-final, 3 syllables, root, \*copying  
 doséna → nadóse dozen, N

Third, the position of stress. In Tagalog, primary stress can fall on the final or penultimate syllable (French 1988). It could be that words with final stress trigger consonant copying, since stressed syllables are more prominent for triggering phonological processes (Beckman 1998: ch.3). However, in (6) consonant copying applies to suffixed words, regardless of whether the moving syllable was unstressed (a) or stressed (d); but not to root words, again without regard to unstressed (b, c) versus stressed (e, f). Thus, stress does not condition consonant copying.

(6) Position of stress? No.

- (a) Unstressed, 3 syllables, suffixed, ✓copying  
 hawák-an → kanháwak take hold of something, V
- (b) Unstressed, 2 syllables, root, \*copying  
 háwak → wákha grip, N
- (c) Unstressed, 3 syllables, root, \*copying  
 tahánan → nantáha home, N
- (d) Stressed, 3 syllables, suffixed, ✓copying  
 takip-án → pántakíp cover, V
- (e) Stressed, 2 syllables, root, \*copying  
 takíp → kiptá cover, N
- (f) Stressed, 3 syllables, root, \*copying  
 mabilís → lismabí quick, A

Rather, the correct conditioning factor is suffixation. As seen in (4)-(6), but more explicitly in the pairs in (7), root words (i) do not exhibit consonant copying, but corresponding suffixed words (ii) do. Note also that the type of consonant does not condition copying: the broad range of consonants that are copied in the (ii) examples in (7) – [t, k, p, y, l, n] – do not form a natural class smaller than that of consonants.

(7) Suffixation – Yes!

- (a) (i) palít → litpá exchange, V  
 (ii) palit-án → tánpalít exchange (object focus), V
- (b) (i) háwak → wákha grip, N  
 (ii) hawák-an → kanháwak take hold of something, V
- (c) (i) takíp → kiptá cover, N  
 (ii) takip-án → pántakíp cover, V
- (d) (i) ʔáway → wáyʔa fight, N  
 (ii) ʔaway-án → yánʔaway fighting (one another), N
- (e) (i) sampál → palsám slap on the face, N  
 (ii) sampal-ín → linsampál slap someone, V

(f)	(i) <sup>6</sup>	trén	→	trén	train, N
	(ii)	tren-ín	→	níntrén	travel somewhere by train, V

In sum, consonant copying is conditioned by suffixation. The rest of this paper argues that consonant copying is motivated by the desire to remain faithful to the root. Descriptively, consonant copying in suffixed words allows a faithful representation of the root to appear in the output, since the moved syllable is mostly an affix. Taking (7a) as an example, the root form *palít* appears in the suffixed game form *tànpalít* by virtue of copying the final consonant of the root. By contrast, root faithfulness is hopelessly violated when the game applies to root words, because the moved syllable is all part of the root. The next section formalises a root faithfulness analysis of consonant copying.

### 3 Analysis

This section proposes an analysis of Tadbaliiks consonant copying consisting of five Optimality Theoretic constraints (Prince & Smolensky 1993). The crux of the analysis is a root faithfulness constraint, which emerges when assessing candidates for suffixed words and drives consonant copying. After introducing the constraints, we will see how they play out in tableaux.

The first two constraints are those involved in playing Tadbaliiks:

- (8) LAST- $\sigma$ -1<sup>st</sup>  
*Assign a violation if there is no movement of the last syllable of the Tagalog output to the beginning of the Tadbaliiks output.*
- (9) LINEARITY (McCarthy & Prince 1995)  
*No metathesis.*

Undominated LAST- $\sigma$ -1<sup>st</sup> is the ‘game constraint’: it is an ‘anti-faithfulness’ constraint that ensures the last-to-first syllable transposition game is played. LAST- $\sigma$ -1<sup>st</sup> is transderivational (Benua 1997) in that it takes as its input the syllabified output of non-game Tagalog phonology rather than the underlying form. Since it operates on syllables, the input to LAST- $\sigma$ -1<sup>st</sup> must be syllabified. For example, the underlying form /palit/ is syllabified as [pa.lit] by non-game Tagalog phonology, so LAST- $\sigma$ -1<sup>st</sup> returns [lit.pa], not \*[it.pal].

LINEARITY is the low-ranked faithfulness constraint corresponding to undominated LAST- $\sigma$ -1<sup>st</sup>. LINEARITY is inevitably violated in playing the game. The all-or-nothing formulation in (9) suffices for our purposes – any amount of metathesis is punished by a single violation mark <\*> – since LINEARITY does not play any explanatory role in the analysis.

Three further constraints are involved in consonant copying:

- (10) \*STRUC( $\sigma$ ) (Riggle 2006; Zoll 1993, 1994)  
*Assign one violation per syllable in the output.*
- (11) ID-ROOT  
*Assign a violation if any segment of the underlying Tagalog root is not faithfully represented in the Tadbaliiks output in linear order.*
- (12) INTEGRITY (McCarthy & Prince 1995)<sup>7</sup>  
*Assign one violation for each segment in the input that has multiple correspondents in the output.*

<sup>6</sup> Monosyllabic words are unaffected by syllable transposition for my speakers. However, in other dialects of Tadbaliiks (Garcia 1934, Conklin 1956) the last-to-first syllable manipulation rule is supplemented by a rule particular to monosyllables, which inverts the order of the segments, e.g. *mag* → *gam* ‘to’, P. The French language game Verlan works similarly (Lefkowitz 1991; Plénat 1995; i.a).

<sup>7</sup> Cf. Itô, Kitagawa & Mester’s (1996: 258f.) implementation of vowel copying in the Japanese ludling Zuuja-go as violating BIJECTIVITY.

ID-ROOT is the heart of the analysis: it drives consonant copying in the Tadbaliiks game output by enjoining faithfulness to the underlying Tagalog root. For example, Tagalog [pa.li.tan] becomes Tadbaliiks [tan.pa.lit], which includes a faithful representation of the underlying Tagalog root /palit/. ID-ROOT is a positional faithfulness constraint that privileges the root (McCarthy and Prince 1995; Beckman 1998, especially ch.4). The details of the definition in (11) are justified in §6, where we will see that ID-ROOT is (i) all-or-nothing in enjoining faithfulness to every segment of the underlying root; and (ii) sensitive to the linear order rather than the contiguity of said segments.

Satisfaction of ID-ROOT must be economical: copying a single consonant is fine, but any more is too much. Hence ID-ROOT is ranked above INTEGRITY, a constraint that punishes copying; but below \*STRUC( $\sigma$ ), a constraint that punishes (extra) syllables. In other words, if copying just a single consonant will satisfy ID-ROOT, then do so; but if copying any syllabic material would be necessary to satisfy ID-ROOT, then don't.

With the ranking presented in the tableaux in (13), we correctly predict no copying when Tadbaliiks is played on root words (13), but consonant copying when it is played on suffixed words (14):<sup>8</sup>

(13) palit → litpa exchange, V

/palit/ [pa.lit]	LAST- $\sigma$ -1 <sup>st</sup>	*STRUC( $\sigma$ )	ID-ROOT	INTEGRITY	LINEARITY
a. palit	*!	**			
b. itpal	*!	**	*		*
c. $\text{litpa}$		**	*		*
d. litpal		**	*	*!	*
e. litpalit		***!		***	*

(14) palit-án → tanpalit exchange (object focus), V

/palit-an/ [pa.li.tan]	LAST- $\sigma$ -1 <sup>st</sup>	*STRUC( $\sigma$ )	ID-ROOT	INTEGRITY	LINEARITY
a. palitan	*!	***			
b. anpalit	*!	***			*
c. tanpali		***	*!		*
d. $\text{tanpalit}$		***		*	*
e. tanpalitan		****!		***	*

In both (13) and (14), LAST- $\sigma$ -1<sup>st</sup> forces the game to be played, ruling out no (a) or partial (b) movement of the last syllable to the beginning of the word. In satisfying LAST- $\sigma$ -1<sup>st</sup>, all remaining candidates violate low-ranked LINEARITY. The question is whether ID-ROOT should be satisfied. Satisfying ID-ROOT by repeating the whole syllable (e) loses on \*STRUC( $\sigma$ ). The difference between (13) and (14) comes in their treatment of the plain candidate (c) and the consonant copying candidate (d). With the root word input in (13), ID-ROOT is hopelessly violated by both (c) and (d); so plain (c) is preferred over consonant copying (d) by INTEGRITY. With the suffixed word in (14), on the other hand, consonant copying (d) economically satisfies ID-ROOT (*tanpalit* realises /palit/), so consonant copying (d) is preferred over plain (c), despite violating INTEGRITY.

Analysing consonant copying in this way makes a correct prediction about the behaviour of epenthetic [h] (15). In Tagalog, *h*-epenthesis resolves hiatus between a root-final vowel and a vowel-initial suffix. In Tadbaliiks, the epenthetic [h] moves with its syllable to the beginning of the word, but is not copied.<sup>9</sup>

<sup>8</sup> Though not shown in the tableaux, I assume high-ranking MAX to temper \*STRUC( $\sigma$ ). For two-syllable inputs, as in (13), a monosyllabic candidate such as *lit* would lose on LAST- $\sigma$ -1<sup>st</sup>, since syllable transposition would not be recoverable. But for longer inputs, as in (14), a two-syllable candidate *tanpa* would satisfy LAST- $\sigma$ -1<sup>st</sup> and win on \*STRUC( $\sigma$ ) – were it not for high-ranking MAX punishing deletion of *lit*.

<sup>9</sup> See §5.4 on word-final *-h*.

(15) *-hin* and *-han*, ✕ copying

- (a) (i) sábi → bisá \*bihsá saying, N  
(ii) sabí-hin → hínsábi \*hínsábih say, V
- (b) (i) tása → sáta \*sáhta cup, N  
(ii) tása-han → hantása \*hantásah measure, V

The fact that epenthetic [h] does not undergo consonant copying is predicted by the root faithfulness analysis, as demonstrated for (15a) in (16).

(16) sabí-hin → hínsábi say, V

/sabi-in/ [sa.bi.hin]	LAST-σ-1 <sup>st</sup>	*STRUC(σ)	ID-ROOT	INTEGRITY	LINEARITY
a. sabihin	*!	***			
b. insabih	*!	***			*
c. $\varnothing$ hinsabi		***			*
d. hinsabih		***		*!	*
e. hinsabihin		****!		***	*

As above, LAST-σ-1<sup>st</sup> rules out no (a) or partial (b) movement of the last syllable to the beginning of the word, and all remaining candidates violate low-ranked LINEARITY. All remaining candidates additionally satisfy ID-ROOT, since all somewhere realise /sabi/ – epenthetic [h] not being part of the root. Gratuitous syllable repetition (e) loses on \*STRUC(σ), and gratuitous consonant copying (d) on INTEGRITY, leaving plain (c) as the winning candidate.<sup>10</sup>

With the analysis established, the next section considers how the effects of ID-ROOT can be characterised as ‘the emergence of the faithful’.

#### 4 Emergence of the faithful

*Pace* Vaux (2011: 727), plenty of language game effects are limited by considerations of naturalness or markedness, to an extent Optimality Theory would predict. Language games often present cases of The Emergence of the Unmarked (TETU) (McCarthy and Prince 1995). Take the emergence of the constraint ONSET in segment reversal in the otherwise syllable reversing ludling Dhochi (Borowsky and Avery 2009: 172), played in the language Dholuo (West Nilotic, western Kenya). Syllable reversal should yield *čier* → \**erči*, ‘to rise from the dead’. Instead, the onsetless first syllable is repaired by segment reversal, yielding *čier* → *reči*. This repair is made despite Dholuo elsewhere permitting onsetless first syllables; hence TETU of ONSET.<sup>11, 12</sup>

<sup>10</sup> More complicated is the behaviour of the linker morpheme /ŋ/. The linker indicates semantic relatedness, such as between an adjective and a noun. At first glance, it might seem that the linker morpheme undergoes consonant copying as in (i). Since the linker is not part of the root, copying of the linker would go against the root faithfulness analysis. However, in (ii) the second [ŋ] in the game word is not in a position to be copied, as the coda rather than the onset of the moved syllable; i.e., any consonant copying would have applied to [k], not [ŋ]. Rather, [ŋ] seems to have been re-inserted (for syntactico-semantic reasons) after syllable manipulation has applied. Reanalysing (i) as reinsertion (iii) rather than copying deflects the challenge posed to the root faithfulness analysis:

- (i) mabaŋó+ŋ = mabaŋŋ → ŋòŋmabáŋ fragrant, A + linker  
(ii) malakí+ŋ = malakíŋ → kíŋmaláŋ great, A + linker  
(iii) mabaŋó+ŋ = mabaŋŋ → ŋòŋmabáŋ fragrant, A + linker

<sup>11</sup> TETU of ONSET could also account for consonant copying in minority outputs in Nevins and Vaux’s (2003) survey of Pig Latin (*ig-pay atin-lay*), e.g. 1% *enter* → *ter-ent-ay*; *pace* their serial Steriadean (1988) full copy plus deletion analysis.

<sup>12</sup> For another example, see Itô, Kitagawa & Mester (1996) on TETU of optimal prosodic foot structure in the Japanese ludling Zuuja-go through the interaction of prosodic markedness and minimal distortion of base. Interestingly, this

In contrast to TETU, consonant copying in Tadbaliiks could be viewed as ‘the emergence of the faithful’ (cf. Lee 1996). Moving the last syllable to the front of the word usually ruins any reasonably economical chance of realising a faithful form of the root in the output. But with suffixed words, all but the onset of the last syllable of the word is an affix. In moving this (mostly) affixed syllable, it is possible to both play the game and faithfully realise the root by copying just one consonant. Thus, the opportunity to be faithful emerges under suffixation, where it does not present itself elsewhere in the game. Compare Vaux’s (2011: 736) claim that language games show learning is aggressive, and that “speakers frequently overapply phonological generalizations, resulting in unnecessary violations of surface faithfulness”. With consonant copying in Tadbaliiks, we have a case of a language game restoring faithfulness to the root where the opportunity to do so emerges.

Emergence of the faithful by consonant copying in language games may not be limited to Tadbaliiks. Jahr (2003: 294) reports on the Norwegian last-to-first syllable ludling Smoi. Though the data set is small, it seems that consonant copying occurs when the transposed syllable is predominantly a suffix, offering the opportunity to faithfully realise the root; e.g., the suffixal definite article in *bank-en* → *kenbank* ‘the bank’.

## 5 Alternative analyses

On the analysis in §3, consonant copying economically satisfies an emergent root faithfulness constraint when Tadbaliiks is played on suffixed words. This section compares the root faithfulness analysis against five alternatives. Three previous analyses are found wanting: (i) a correspondence theoretic analysis (Sanders 2000), which does not speak to consonant copying and is conceptually questionable; (ii) an analysis in terms of crossing association lines (Bagemihl 1989), which incorrectly predicts consonant copying to be impossible; and (iii) a directed graph model of precedence relations (Raimy 2000), which can formally implement copying but does not predict when it should occur. In addition to these previous proposals, I consider two further possible analyses: (iv) in terms of a constraint against word-final open syllables, which cannot explain why root and suffixed words behave differently with respect to consonant copying; and (v) in terms of a correspondence-theoretic anchoring constraint independently active in Tagalog foot-sized reduplication. This last analysis fares equally with the root faithfulness analysis, until further data are considered in §6.

### 5.1 Correspondence Theory

McCarthy and Prince (1995) developed Correspondence Theory to account for reduplication, with constraints enjoining Base-Reduplicant correspondence: output-output correspondence between the surface forms of the base and the reduplicant, an underlyingly empty affix RED.<sup>13</sup> Correspondence Theory has been applied to syllable transposition language games as Base-Game (Barlow 1997, Barlow 2001), Base-Argot (Itô, Kitagawa and Mester 1996; Borowsky and Avery 2009), or Base-Ludligant (Sanders 1999, 2000; Friesner 2005) correspondence.

Sanders (2000) applies Correspondence Theory to Tadbaliiks. The empty morpheme LUD, or ‘ludligant’  $\lambda$ , is affixed to a stem, and realised by movement out of linear order of some phonological material of the base. Last-to-first movement arises from the interaction of two constraints: movement is to the beginning of the word due to ALIGN-LEFT( $\lambda$ , PrWd), which requires the left edge of  $\lambda$  to align with the left edge of prosodic word; while movement is from the end of the word due to IO-ANCHOR-RIGHT(BASE,  $\lambda$ ), which requires the rightmost segment of base to be the rightmost segment of ludligant.

Sanders’ analysis is empirically incomplete and conceptually questionable. Empirically, consonant copying is not reported, and would in fact be punished by one of Sanders’ constraints, \*COPY. More problematically, Tadbaliiks manipulates syllables; yet while the correspondence theoretic constraints derive last-to-first movement, they say nothing about how much material should move. Movement of a single segment is in fact the most harmonic option in Sanders’ system, since it incurs the fewest violations of LIN(earity). Further constraints would be needed to ensure that the ludligant is a syllable in size.

Conceptually, correspondence-theoretic analyses of language games like Tadbaliiks essentially equate syllable transposition with reduplication; but are reduplication, where material is copied, and transposition,

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can result in copying – though of vowels rather than consonants – as in (iv), where a single mora base is rendered in optimal three-mora form:

(iv) *hi* → *i:hi*, ‘cigarette light, lit. fire’

<sup>13</sup> Cf., before its time, Steriade (1988).



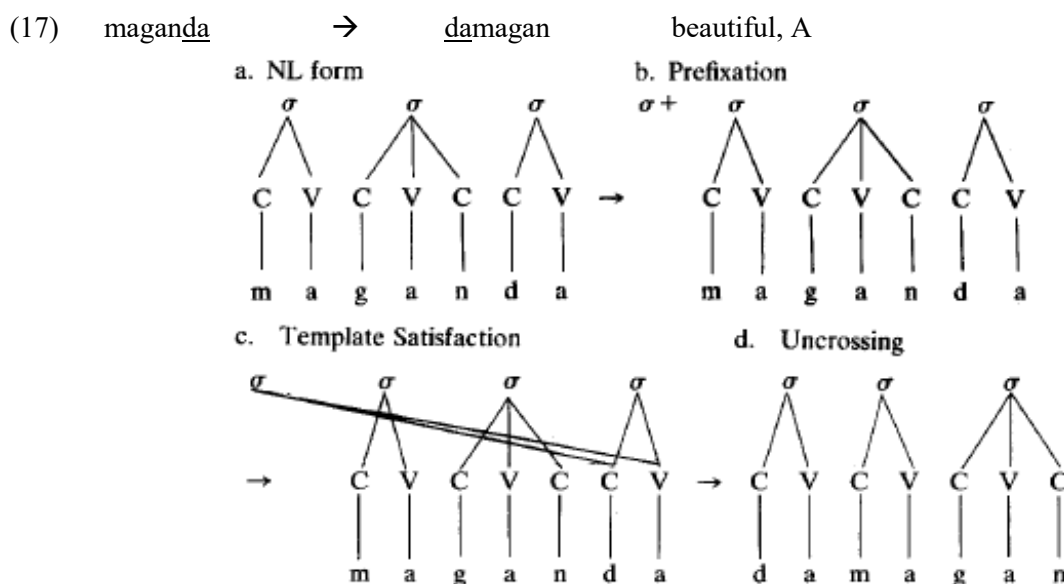
where material is moved, operationally so alike? More broadly, such analyses make an implicit claim to naturalness in their use of alignment and anchoring constraints that are standardly posited among Optimality Theory's universal constraint set, CON. However, while the crucial alignment and anchoring constraints are of an independently motivated format, they remain fundamentally game-specific in content. In referring to the ludligant  $\lambda$ , they are no less game specific than LAST- $\sigma$ -1<sup>st</sup>, our 'game constraint' from §3. Game constraints are much more likely spontaneous than members of CON (cf. Vaux 2011: 734).

In sum, a correspondence-theoretic account of Tadbaliiks, as in Sanders (2000), does not speak to the empirical phenomenon of consonant copying, and makes conceptually questionable pretensions to naturalness.

### 5.2 Crossing Constraint

Bagemihl's (1988, 1989) analysis in terms of the Crossing Constraint predicts consonant copying to be impossible. The Crossing Constraint is the central tenet of autosegmentalism (Goldsmith 1976) and states that association lines must not cross.<sup>14</sup> Bagemihl proposes to parameterise the Crossing Constraint in order to account for language games. Whereas the Crossing Constraint is enforced as its unmarked setting in normal language, it is switched to its opposite in language games, requiring association lines to cross. Further parametric granularity is claimed to generate all and only the full range of ludlings.

In last-to-first syllable transposition games, including Tadbaliiks (Bagemihl 1989: 513ff.), the Crossing Constraint is set to maximal crossing at the syllable level. A prefixed empty syllable template is filled by crossing association lines maximally through to the last syllable of the word. The original syllable is then deleted, resulting in the appearance of movement. Bagemihl (1989: 514) illustrates for Tadbaliiks in (17):



Thus, while association lines must cross during the derivation, they are uncrossed by 'movement'. This is crucial, argues Bagemihl (1989), since crossing association lines are fundamentally ill-formed and must be undone to restore non-contradictory precedence and overlap relations (Sagey 1986, 1988); that is, movement must be total. But this rules out consonant copying (Nevins & Vaux 2003; Vaux 2011: 740), which we saw in Tadbaliiks in §2. Thus Bagemihl's (1989) account in terms of the Crossing Constraint is fatally flawed, since it incorrectly predicts that consonant copying will never occur in a transposition game like Tadbaliiks.<sup>15</sup>

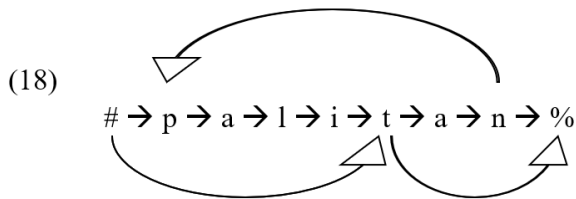
### 5.3 Directed graphs

Bagemihl's (1989) model does not admit consonant copying, since total movement is needed to eliminate contradictory precedence relations. Other models can formally implement copying. For instance, Raimy's

<sup>14</sup> Cf. Itô, Kitagaawa & Mester's (1996) Cross Anchoring for the Japanese ludling Zuuja-go.

<sup>15</sup> Bagemihl's (1989: 513, note 26) empty syllable affixes are inspired by McCarthy and Prince's (1986) theory of reduplication, though in reduplication there is no movement to uncross the association lines.

(1999, 2000) directed graph model of precedence relations as serial rule-based loops in underlying temporal precedence structures could yield *palit-án* → *tànpalít* with consonant copying as in (18) – skipping from the start symbol # to *t*, from *n* back to *p*, and from *t* to the stop symbol %:<sup>16</sup>



However, while such a model may work well for implementing reduplication and copying, it has nothing to say about when or why it should occur. The model does not encode any instructions for when to introduce certain precedence arrows, and when others. By contrast, the analysis from §3 motivates repetition of the consonant in the precedence relations (i.e., copying) when it will economically satisfy root faithfulness.

Having dismissed three previous analyses, the rest of this section considers two additional analytical possibilities.

#### 5.4 FINAL-C

It is debated whether word-final syllables are ever truly open in Tagalog, or closed with [h] (Llamzon 1966, Schachter and Otones 1972, French 1988, Coombs 2017). If the latter, the data in (3) would be revised as in (19), with final *-h* on the Tadbaliiks word in (a).

- (19) (a) *palít* → *litpáh* \**litpál* exchange, V  
 (b) *palit-án* → *tànpalít* \**tànpalih* exchange (object focus), V

From this perspective, Tadbaliiks consonant copying might look to be TETU of FINAL-C, a markedness constraint requiring syllables to be closed. However, such an analysis could not explain the difference in behaviour between root words (*h*-epenthesis) and suffixed words (root-consonant copying): if *h*-epenthesis closes the open word-final syllable in (a), why wouldn't it also do so in (b)?

#### 5.5 R-ANCHOR

On a final alternative analysis, Tadbaliiks consonant copying could be driven not by ID-ROOT, but by emergent R-ANCHOR along the lines in (20).

- (20) R-ANCHOR  
*Assign a violation if the rightmost segment of a Tadbaliiks word is not the same as the rightmost segment of the underlying Tagalog root.*

In other words, a Tadbaliiks word should ideally end with the same segment as the Tagalog root it was formed from. For example, Tagalog [pa.li.tan] becomes Tadbaliiks [tan.pa.lit], whose rightmost segment [t] is the same as the rightmost segment of /palit/.

§5.1 argued that there are conceptual problems with using a correspondence-theoretic constraint like R-ANCHOR to account for a transposition language game. But R-ANCHOR has Occam's Razor on its side since R-ANCHOR is independently active in Tagalog foot-sized reduplication. In general, only CVCV is reduplicated (21); but with disyllabic consonant-final roots, CVCVC is reduplicated (22), since by R-ANCHOR the rightmost segment of the reduplicant is anchored to the rightmost segment of the base.

- (21) CVCV foot-sized reduplication

<sup>16</sup> For other copy(-and-truncation)-type models, see references in Nevins and Vaux (2003).

	(a)	(i)	dalawa	two, Num	(ii)	dala-dalawa	two-by-two, A
	(b)	(i)	baligtad	reversed, A	(ii)	mag-pa-bali-baligtad	to tumble, V
(22)	CVCVC foot-sized reduplication on disyllabic C-final roots						
	(a)	(i)	jakap	embrace, V	(ii)	jakap-jakap	lovingly embrace, V
	(b)	(i)	patid	broken, A	(ii)	patid-patid	disjointed, A

If Tadbaliiks consonant copying could be ascribed to R-ANCHOR, it would still be emergent faithfulness, since ANCHOR constraints are faithfulness constraints in Correspondence Theory (McCarthy and Prince 1995).<sup>17</sup>

So far, we have not encountered data that can distinguish between R-ANCHOR and ID-ROOT: replacing ID-ROOT with R-ANCHOR in the tableaux in (13), (14) and (16) would not change the crucial violation profiles. But the two constraints are distinct in how much of the root they care about: R-ANCHOR only cares about the root-final consonant, whereas ID-ROOT cares about the whole underlying root. The next section provides evidence that ID-ROOT is the correct constraint for Tadbaliiks.

## 6 Root faithfulness

On the analysis in §3, Tadbaliiks consonant copying is driven by the emergent effect of ID-ROOT.

### (11) ID-ROOT

*Assign a violation if any segment of the underlying Tagalog root is not faithfully represented in the Tadbaliiks output in linear order.*

This section justifies the details of this constraint definition, elaborating on what it takes to satisfy ID-ROOT; in other words, what it means to be faithful to the root in Tadbaliiks. First, ID-ROOT is all-or-nothing, since words where part of the root has been deleted do not exhibit consonant copying. This fact argues in favour of ID-ROOT over R-ANCHOR. Second, ID-ROOT is sensitive to linearity, not contiguity, since infixed words – where linearity is maintained but contiguity is broken – do exhibit consonant copying.

### 6.1 ID-ROOT is all-or-nothing

In some Tagalog words, the root-final vowel deletes under suffixation. These shortened suffixed words do not exhibit consonant copying in Tadbaliiks, as in (23):

#### (23) Shortened suffixed words, \* copying

(a) <sup>18</sup>	(i)	bukás	→	kasbú		open, A
	(ii)	buks-án	→	sanbúk	*sanbúks	to open something, V
(b) <sup>19</sup>	(i)	lagáy	→	gaylá		to put, V
	(ii)	lagy-án	→	yanlág	*yanlág	to put somewhere, V

This absence of consonant copying in shortened suffixed words suggests that ID-ROOT is an all-or-nothing constraint: since root faithfulness has already been destroyed by vowel deletion, there is no point to consonant copying. Characterising ID-ROOT in this all-or-nothing manner means the tableau in (24) makes the correct prediction for (23aii):

<sup>17</sup> On the other hand, the data in (19) could equally well be interpreted in terms of ID-ROOT: where the opportunity emerges to realise a faithful copy of the whole root as the reduplicant by copying just one consonant more, do so.

<sup>18</sup> Final *-ks* would not be ill-formed. Recall Tadbaliiks from footnote 1, with optional game final *-s*. Hence we cannot rely on a constraint along the lines of \*CC]<sub>w</sub> or \*COMPLEXCODA – \* (word-final) consonant clusters – to rule out consonant copying in (20aii). This stylistic *-s* was semi-productive, though seemingly unsystematically, for one of my speakers; e.g. *palitán* → *tanpalits* ‘exchange (object focus)’, V.

<sup>19</sup> Compare (23b) with its unreduced form, which has a different meaning, and *does* exhibit consonant copying: *lagáy-an* → *yanlágay* ‘place where you put something’, N.

(24) buks-án → sanbúk to open something, V

/bukas-an/ [buk.san]	LAST-σ-1 <sup>st</sup>	*STRUC(σ)	ID-ROOT	INTEGRITY	LINEARITY
a. buksan	*!	**	*		
b. anbuks	*!	**	*		*
c. ☞ sanbuk		**	*		*
d. sanbuks		**	*	*!	*
e. sanbuksan		***!	*	***	*
f. buksan	*!	***			
g. sanbuka		***!	*		*
h. sanbukas		***!		*	*
i. sanbukasan		***!*		***	*

As in §3, (a) and (b) don't play the game, so fall to LAST-σ-1<sup>st</sup>; while syllable copying (e) falls to \*STRUC(σ). Vowel deletion means the syllabified Tagalog output [buk.san] already violates ID-ROOT to /bukas/, so consonant copying (d) and plain (c) tie in violating ID-ROOT, and plain (c) is preferred by INTEGRITY. Candidates (f)-(i) reintroduce the /a/ of /bukas/, but fall to \*STRUC(σ) before any positive impact on ID-ROOT can be felt.

The absence of consonant copying in shortened suffixed words shows that ID-ROOT cares about faithfulness to all segments of the underlying root, and not just the final consonant as R-ANCHOR would have it. Replacing ID-ROOT with R-ANCHOR in (25) incorrectly predicts consonant copying (d) to be the winning candidate:

(25) buks-án → \*sanbúks to open something, V

/bukas-an/ [buk.san]	LAST-σ-1 <sup>st</sup>	*STRUC(σ)	R-ANCHOR	INTEGRITY	LINEARITY
a. buksan	*!	**	*		
b. anbuks	*!	**			*
c. ☹sanbuk		**	*!		*
d. ☹sanbuks		**		*	*
e. sanbuksan		***!	*	***	*
f. buksan	*!	***	*		
g. sanbuka		***!	*		*
h. sanbukas		***!		*	*
i. sanbukasan		***!*	*	***	*

Candidates (a) and (b) fall to LAST-σ-1<sup>st</sup>, and syllable copying (e) and (f)-(i) to \*STRUC(σ). Now R-ANCHOR wants the Tadbaliiks version of Tagalog [buk.san] to have the same rightmost segment as the underlying root /bukas/, i.e., [s]. Consonant copying (d) has rightmost [s] where plain (c) does not, so (d) incorrectly wins on R-ANCHOR. Therefore, all-or-nothing ID-ROOT, with its requirement for a faithful representation of every segment of the root, is preferable to R-ANCHOR in accounting for consonant copying in Tadbaliiks.

## (11) ID-ROOT

*Assign a violation if any segment of the underlying Tagalog root is not faithfully represented in the Tadbaliiks output in linear order.*



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